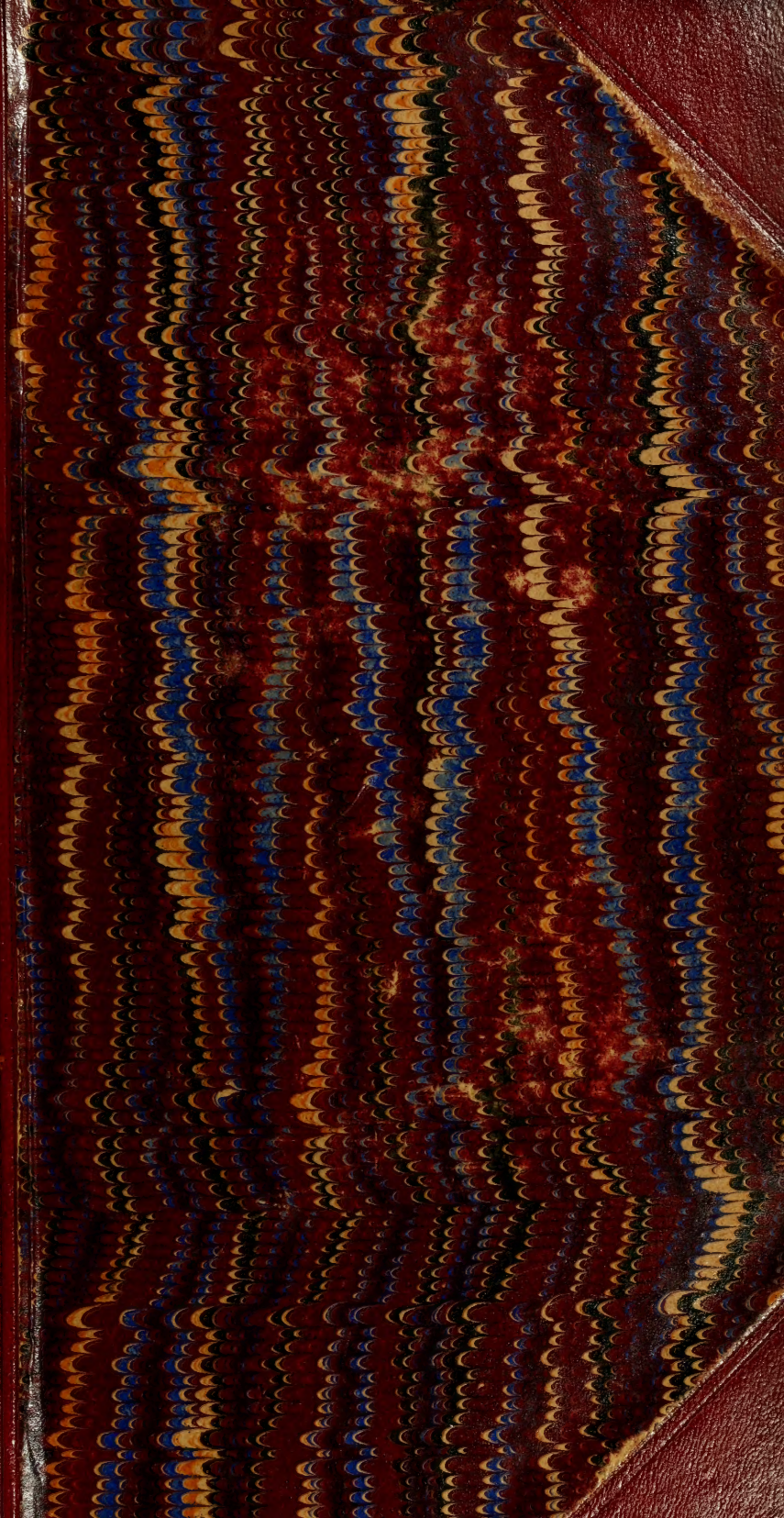


QL
671
A923
Birds



J-7

10

772
27m.

OLD SERIES, }
VOL. XXI }

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB.

{ NEW SERIES,
VOL. XIII }

The Auk

A Quarterly Journal of Ornithology

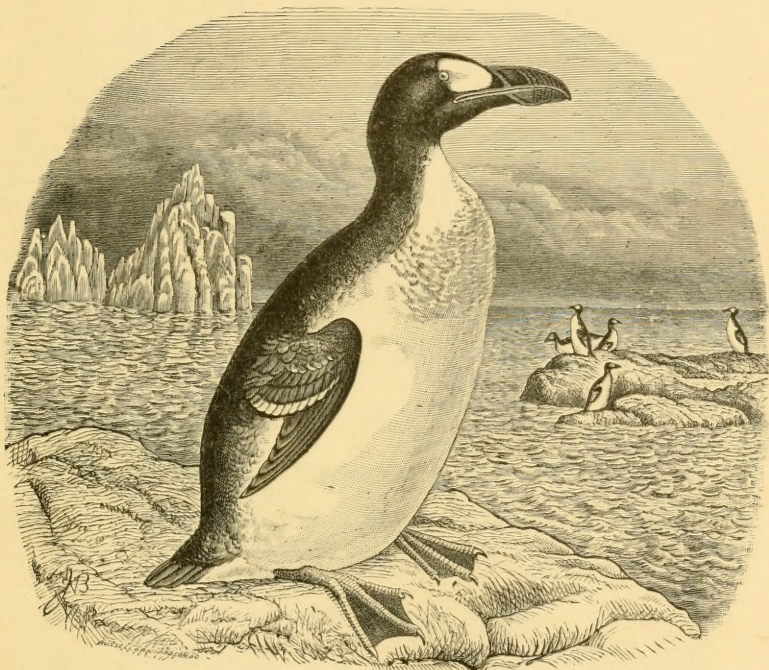
84

EDITOR

J. A. ALLEN

ASSOCIATE EDITOR

FRANK M CHAPMAN



VOLUME XIII

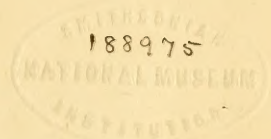
PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER

1896



CONTENTS OF VOLUME XIII.

NUMBER I.

	PAGE
IN MEMORIAM: GEORGE NEWBOLD LAWRENCE. By <i>D. G. Elliot, F. R. S. E.</i> (Frontispiece.).	1
THE STANDING OF <i>Ardetta neoxena</i> . By <i>Frank M. Chapman</i> . (Plate I.)	11
AN IMPORTANT FACTOR IN THE STUDY OF WESTERN BIRD-LIFE. By <i>Carl F. Baker</i>	20
THE PINE GROSBEEK IN CAPTIVITY. By <i>O. W. Knight</i>	21
DESCRIPTIONS OF AN APPARENTLY NEW SPECIES AND SUBSPECIES OF PTARMIGAN FROM THE ALEUTIAN ISLANDS. By <i>D. G. Elliot, F. R. S. E.</i> (Plate III.)	24
SONGS OF THE WESTERN MEADOWLARK. By <i>L. Belding</i>	29
A NEW SUBSPECIES OF THE GENUS <i>Dryobates</i> . By <i>A. W. Anthony</i>	31
DESCRIPTION OF A NEW JAY FROM MEXICO. By <i>Gerrit S. Miller, Jr.</i>	34
NESTING HABITS OF <i>Phainopepla nitens</i> IN CALIFORNIA. By <i>Florence A. Merriam</i>	38
DESCRIPTIONS OF A NEW WARBLER AND A NEW SONG SPARROW. By <i>William Brewster</i>	44
THE TERNS OF MUSKEGET ISLAND, MASSACHUSETTS. PART II. By <i>George H. Mackay</i>	47
THIRTEENTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION. By <i>John H. Sage</i>	55

RECENT LITERATURE.

Elliot's Monograph of the Pittidae; 60; The Fossil Birds of Patagonia, 61; Elliot's Limicolæ, 64; Some Canadian Birds, 67; Kirkwood on Maryland Birds, 67; The Structure and Life of Birds, 68; The A. O. U. Check-List of North American Birds, Second Edition, 69; Hudson's British Birds, 70; Bendire on the Cowbirds, 71; Lucas on the Weapons and Wings of Birds, 72; Fisher's Hawks and Owls from the Standpoint of the Farmer, 73; Beddard's 'Text-book of Zoögeography,' 73; Townsend on the Birds of Cocos Island, 75; Publications Received, 76.

GENERAL NOTES.

Do Young Loons eat Fresh-water Clams? 77; 'Gull Dick' Again, 78; An Early Description of *Phalacrocorax dilophus*, 78; Another Harlequin Duck Record for Long Island, 78; *Olor buccinator* in Western Minnesota, 78; White-faced Glossy Ibis Breeding in Minnesota, 79; *Ardeetta neoxena* from Wisconsin, 79; The King Rail Again in Maine, 79; Baird's Sandpiper in Maine, 80; The 1895 Migration of *Charadrius dominicus* in Massachusetts, 80; Habits of the Valley Partridge, 81; Additional Records of the Passenger Pigeon (*Ectopistes migratorius*) in Wisconsin and Illinois, 81; The Golden Eagle in New Jersey, 81; The Golden Eagle in Maine, 82; A New Long Island, N. Y., Record for the Red-bellied Woodpecker, 82; The Deltoid Muscle in the Swifts, 82; The Scissor-tailed Flycatcher in Virginia and Maryland, 83; The Raven in Illinois, 83; The Ipswich Sparrow,—A Correction, 84; Second Occurrence of the Lark Sparrow in Virginia, 84; The Cape May Warbler (*Dendroica tigrina*) in the Maritime Portions of South Carolina, 84; The Carolina Wren in Connecticut, 84; The Red-breasted Nuthatch (*Sitta canadensis*) on Long Island, South Carolina, 84; The Dwarf Thrush in Colorado, 85; Food of Woodpeckers and Flycatchers, 85; Rare Visitors to the Connecticut River Valley in Massachusetts in 1895, 86; A correction, 86; Notes on Long Island Birds, 87; Nantucket Island Notes, 88; Gätke's Birds of Heligoland, 89.

CORRESPONDENCE.

The Soaring of Birds and Currents of Air, 92.

NOTES AND NEWS.

Obituary, Thomas Henry Huxley, 93; Henry Seebohm, 96; Henry T. Wharton, 97; Ornithological Lectures at Columbia College, 97; Kent Ornithological Club, 98; Protection of North American Birds, 98.

NUMBER II.

	PAGE
ON THE FLORIDA GROUND OWL (<i>Speotyto floridana</i>). By William Palmer. (Plate II.)	96
THE TAXONOMIC VALUE OF THE TONGUE IN BIRDS. By Frederic A. Lucas.	106
NOTES ON SOME OF THE BIRDS OF SOUTHERN CALIFORNIA. By Florence A. Merriam	115
THE LAW WHICH UNDERLIES PROTECTIVE COLORATION. By Abbott H. Thayer.	124

	PAGE
DESCRIPTIONS OF A NEW HORNED LARK AND A NEW SONG SPARROW, WITH REMARKS ON SENNETT'S NIGHTHAWK. By <i>Louis B. Bishop</i> .	129
AN APPARENTLY NEW <i>Chordeiles</i> FROM COSTA RICA, By <i>George K. Cherrie</i> .	135
GATKE'S 'HELIGOLAND.' By <i>J. A. Allen</i> .	137
A REVISION OF THE NORTH AMERICAN HORNED OWLS, WITH DESCRIPTION OF A NEW SUBSPECIES. By <i>Witmer Stone</i> .	153

RECENT LITERATURE.

The 'Birds' of 'The Royal Natural History,' 156; Saunders and Salvin's 'Catalogue of the Gaviæ and Tubinares,' 160; Salvadori's Catalogue of the *Chenomorpha*, *Crypturi*, and *Ratite*, 162; Chapman on Changes of Plumage in the Dunlin and Sanderling, 164; Chapman on the Plumage of the Snowflake, 165; Allen on Alleged Changes of Color in the Feathers of Birds without Moulting, 166; The Mockingbird and *Yucca aloifolia*, 167; Loomis on California Water Birds, 168; Publications Received, 169.

GENERAL NOTES.

Brünnich's Murre at Cape Charles, Virginia, 171; The Parasitic Jaeger near Cleveland, Ohio, 171; *Puffinus tenuirostris* off San Diego, California, 171; The Skull of the Young Cormorant, 172; *Clangula hyemalis* at San Diego, California, 172; Occurrence of the Great White Heron at Escondido, California, 172; Note on the *Flexor hallucis brevis* in the Night Heron (*Nycticorax nycticorax nævius*), 172; *Porzana noveboracensis* near Ottawa, Canada, 172; *Crymophilus fulicarius* in Maine, 173; *Crex crex* in Maine, 173; Baird's Sandpiper in Michigan, 174; Western Sandpiper (*Erannetus occidentalis*) more abundant than the Semipalmated (*E. pusillus*), 174; Woodpeckers' Tongues—a Plea for Aid, 174; *Pinicola enucleator* in Westchester County, N. Y., 175; The Pine Grosbeak at Poughkeepsie, N. Y., 175; The Pine Grosbeak (*P. enucleator*) in New Jersey, 175; Abnormal Plumage of a Pine Grosbeak, 176; The American Crossbill at Sea, 176; Harris's Sparrow in Spring Dress in Autumn, 176; A Brown Thrasher (*Harporhynchus rufus*) in Massachusetts in winter, 176; A few Notes from Maine, 177; Three Winter Notes from Longwood, Mass., 178; Bird Notes from Erie County, New York, 178; Virginia Notes, 179; On Birds reported as rare in Cook County, Ill., 179; Additions to the Avifauna of Tennessee, 181; Sundry Notes, 182.

CORRESPONDENCE.

Some Questions of Nomenclature, 183; A Question of Nomenclature, 190; 'Ord's Zoölogy' Again, 192; *Chen hyperboræa* and *C. nivalis*, 195.

NOTES AND NEWS.

Obituary, Dr. Willard Lorraine Maris, 193; The Delaware Valley Ornithological Club, 193; The Michigan Ornithological Club, 194; New Edition of Ridgway's 'Manual of North American Birds,' 194; 'The Feather,' 195; The Seeborn collection of Birds, 195; The Field Columbian Museum Expedition to Africa, 196.

NUMBER III.

	PAGE
THE DUCKS OF PLYMOUTH COUNTY, MASSACHUSETTS. By <i>Herbert K. Job.</i>	197
JOHN ABBOT'S DRAWINGS OF THE BIRDS OF GEORGIA. By <i>Walter Faxon.</i>	204
THE PENINSULA OF MISSOURI AS A WINTER HOME FOR BIRDS. By <i>O. Widmann.</i>	216
THE BLACK-VENTED SHEARWATER (<i>Puffinus opisthomelas</i>). By <i>A. W. Anthony.</i>	223
RECENT OBSERVATIONS ON <i>Histrionicus histrionicus</i> IN MAINE. By <i>Arthur H. Norton.</i>	229
SOME NOTES ON THE PASSENGER PIGEON (<i>Ectopistes migratorius</i>) IN CONFINEMENT. By <i>Ruthven Deane.</i>	234
NOTES ON THE BIRDS OF BERMUDA. By <i>D. Webster Prentiss.</i>	237

RECENT LITERATURE.

Stone on the Molting of Birds, 240; Stone on Birds collected in North Greenland, 243; Shalow on a Collection of Birds from West Greenland, 243; Rotzell's Birds of Narberth, Pa., and Vicinity, 244; Rhoads's List of Tennessee Birds, 244; Short's Birds of Western New York, 245; A List of Nebraska Birds, 245; Cory's 'Hunting and Fishing in Florida,' with 'A Key to the Water Birds of the State,' 246; Howe's 'Every Bird,' 247; Artistic and Scientific Taxidermy, 247; Witchell's 'Evolution of Bird Song,' 249; Harvie Brown and Buckley's 'A Vertebrate Fauna of the Moray Basin,' 251; The 'Birds' of the Royal Natural History, 252; Publications Received, 253.

GENERAL NOTES.

Name of the Large-billed Puffin, 255; Record of a Fourth Specimen of the European Widgeon (*Anas penelope*) in Indiana, 255; Recent Occurrence of the Florida Gallinule in Southern Maine, 255; Baird's Sandpiper in Michigan, 255; The Belted Piping Plover in Massachusetts, 256; Discovery of the Eggs of the Belted Piping Plover, 256; Recent Capture of the Golden Eagle near Portland, Maine, 256; Golden Eagles in Virginia, 256; Nidification of the Dusky Horned Owl, 257; Four Winter Records of the Short-eared Owl on the Massachusetts Coast, 257; The Road-runner as a Rat-killer, 257; The Red-headed Woodpecker in Eastern Massachusetts, 258; *Pyrocephalus rubineus mexicanus* in Los Angeles County, Cal., 258; Intergradation in Song of *Sturnella magna* and *S. m. neglecta* in Missouri, 258; *Pinicola, enucleator* at Wor-

chester, Mass., 259; Evening Grosbeak in Southern Wisconsin, 259; *Zonotrichia albicollis* and *Mniotilta varia* at Pasadena, Cal., 260; The Wintering of the Towhee at Longwood, Mass., 260; The Nonpareil at Longwood, Massachusetts, 261; Peculiar Traits of some Scarlet Tanagers, 261; The Occurrence in Nebraska of *Tiroo flavoviridis*, 263; *Helminthophila rubricapilla* vs. *Helminthophila ruficapilla*, 263; Bachman's Warbler (*Helminthophila bachmani*) in Greene County, Arkansas, 264; Second Occurrence of the Blue-gray Gnatcatcher in Maine, 264; Southern California Bird Notes, 265; Merrem's Work, 265; Mandt's Inaugural Dissertation, 266; Correction, 266.

NOTES AND NEWS.

Obituary, Dr. Juan Gundlach, 267; Clarence A. Smith, 267; The Palm Beach Museum, 268; 'The Osprey,' 268; 'The Nidologist,' 268; U. S. Biological Survey, 268; Elliot's African Expedition, 268; Zoölogical Nomenclature, 269.

NUMBER IV.

	PAGE
THE SHARP-TAILED SPARROW (<i>Ammodramus caudacutus</i>) AND ITS GEOGRAPHICAL RACES. By Jonathan Dwight, Jr., (Plate IV)	271
SUMMER BIRDS OF THE ANTHRACITE COAL REGIONS OF PENNSYLVANIA. By R. T. Young.	278
FEEDING HABITS OF THE ENGLISH SPARROW AND CROW. By Sylvester D. Judd.	285
SUMMER BIRDS OF NORTHERN ELK COUNTY, PA. By William L. Bailey.	289
SUMMER BIRDS (JULY 15-AUG. 13, 1894) OF THE RHINE. By Ralph Hoffmann.	297
THE CORMORANT ROOKERIES OF THE LOFOTEN ISLANDS. By R. W. Shufeldt, M. D. (Plate V.).	312
CRITICAL REMARKS ON THE MEXICAN FORMS OF THE GENUS CERTHIA. By Harry C. Oberholser.	314
FURTHER REMARKS ON THE LAW WHICH UNDERLIES PROTECTIVE COLORATION. By Abbott H. Thayer.	318
EVIDENCE SUGGESTIVE OF THE OCCURRENCE OF 'INDIVIDUAL DICHROMATISM' IN <i>Megascops asio</i> . By Arthur P. Chadbourne, M. D.	321

RECENT LITERATURE.

Sclater on Rules for Naming Animals, 325; Swann's Handbook of British Birds, 328; Loomis on California Water Birds, 329; Ridgway on New Species and Subspecies of Birds, 330; Oberholser on Two New Subspecies of *Dryobates*, 330; Richmond on Mexican Birds, 330; Richmond on New Species of Birds, 331; Dr. Abbott's Collections from Asia, 331; Dr. Abbott's Collections from the

Seychelles and other Islands, 331; Robinson's Birds of Margarita, 332; Cherrie on San Domingo Birds, 333; Warren's 'Taxidermy' and Bird-Laws, 334; Ridgway and Lucas on a New Family of Birds, 334; Montgomery on Migration as a Check upon Geographical Variation, 335; Contributions to Economic Ornithology, 335; Publications Received, 338.

GENERAL NOTES.

Occurrence of the Wood Ibis (*Tantalus loculator*) in Bristol County, Mass., 341; Wilson's Snipe in Nova Scotia in Winter, 341; The Wild Pigeon at Englewood, N. J., 341; Recent Record of the Passenger Pigeon in Southern Wisconsin, 341; The Turkey Vulture in the Catskills, 341; *Buteo borealis harlani* in Minnesota, 342; A note on *Buteo borealis lucasani* Ridgway, 342; Feeding-habits of Purple Finches, 342; First Occurrence of the Blue Grosbeak in New Hampshire, 342; Solitary Vireo (*Vireo solitarius*) nesting in Connecticut, 343; *Dendroica palmarum* in New York City, 343; Breeding of the Yellow-throated Warbler (*Dendroica dominica*) in Virginia, near Washington, 343; The Louisiana Water Thrush breeding in Berkshire County, Mass., 344; The Mockingbird (*Mimus polyglottos*) in Canada, 344; *Thryothorus* or *Thryothorus?* 344; The Hudsonian Chickadee breeding in Southern Vermont, 345; The Hudsonian Chickadee (*Parus hudsonicus*), Red-breasted Nuthatch (*Sitta canadensis*), and Golden-crowned Kinglet (*Regulus satrapa*) in Plymouth County, Mass., in Summer, 346; The Western Martin and the California Cuckoo at Escondido, Cal., 347; Bird Notes from Toronto, Canada, 347; Iridescence of Feathers, as explained by an Old Author, 347; Birds killed by a Storm, 348.

NOTES AND NEWS.

Obituary, Lord Lilford, 348; Eugene Carleton Thurber, 349; Dr. G. Brown Goode, 349; Bird Day in Schools, 349; Museum of Natural History at Providence, 350; 'The Osprey,' 350; 'Das Tierreich,' 350; New Ornithological Publications, 351.

INDEX	353
ERRATA	366

Title Page and Contents	i-viii
Officers and Committees of the A. O. U.	ix
Members of the A. O. U.	x

PLATES IN VOLUME XIII.

Frontispiece, George Newbold Lawrence.

- I. *Ardeetta noxena* Cory.
- II. Florida Burrowing Owl.
- III. Evermann's Ptarmigan (*Lagopus evermanni*).
- IV.
- V. Breeding Cormorants (*Phalacrocorax carbo*).

OFFICERS AND COMMITTEES OF THE AMERICAN ORNITHOLOGISTS' UNION. 1895-96.

	Expiration of Term.
BREWSTER, WILLIAM, <i>President</i>	November, 1896.
MERRIAM, C. HART, }	<i>Vice-Presidents</i>
RIDGWAY, ROBERT, }	
SAGE, JOHN H., <i>Secretary</i>	" 1896.
DUTCHER, WILLIAM, <i>Treasurer</i>	" 1896.

ADDITIONAL MEMBERS OF THE COUNCIL.

ALLEN, J. A.....	November, 1896.
BATCHELDER, C. F.	" 1896.
BENDIRE, CHARLES E.....	" 1896.
CHAPMAN, FRANK M.....	" 1896.
COUES, ELLIOTT.....	" 1896.
ELLIOT, D. G.....	" 1896.
FISHER, A. K.....	" 1896.

EDITORIAL STAFF OF 'THE AUK.'

ALLEN, J. A., <i>Editor</i>	November, 1896.
CHAPMAN, FRANK M., <i>Associate Editor</i>	" 1896.

COMMITTEES.

Committee on Publications.

BREWSTER, WILLIAM, <i>Chairman</i> .	ALLEN, J. A.
SAGE, JOHN H., <i>Secretary</i> .	CHAPMAN, FRANK M.
	DUTCHER, WILLIAM.

Committee of Arrangements for the Meeting of 1896.

BREWSTER, WILLIAM, <i>Chairman</i> .	BATCHELDER, C. F.
SAGE, JOHN H., <i>Secretary</i> .	CHAMBERLAIN, MONTAGUE.
	PURDIE, HENRY A.

MEMBERS' OF THE AMERICAN ORNITHOLOGISTS' UNION. DECEMBER, 1895.

ACTIVE MEMBERS.

[Omission of date indicates a Founder.]

Date of
Election.

ALDRICH, Hon. CHARLES, Boone, Iowa.....	—
ALLEN, Dr. J. A., Am. Mus. Nat. Hist., New York City.....	—
ANTHONY, A. W., 1062 12th St., San Diego, Cal.....	1895
BARROWS, Prof. W. B., Agricultural College, Ingham Co., Mich....	1883
BATCHELDER, CHARLES FOSTER, Cambridge, Mass.....	—
BELDING, LYMAN, Stockton, Cal.....	1883
BENDIRE, Maj. CHARLES E., U. S. A., Smithsonian Institution, Washington, D. C.....	—
BICKNELL, EUGENE P., P. O. Box 2958, New York City.....	—
*BREWSTER, WILLIAM, Cambridge, Mass.....	—
BROWN, NATHAN CLIFFORD, 85 Vaughan St., Portland, Me.....	—
BRYANT, WALTER E., 1352 Franklin St., Oakland, Cal.....	1888
CHADBOURNE, Dr. ARTHUR P., 225 Marlborough St., Boston, Mass..	1889
CHAMBERLAIN, MONTAGUE, Harvard College, Cambridge, Mass....	—
CHAPMAN, FRANK M., Am. Mus. Nat. Hist., New York City.....	1888
COOKE, Prof. W. W., State Agricultural College, Fort Collins, Colo.	1884
*CORY, CHARLES B., Boston, Mass.....	—
*COUES, Dr. ELLIOTT, Smithsonian Institution, Washington, D. C..	—
DEANE, RUTHVEN, 61 Wabash Ave., Chicago, Ill.....	1883
DUTCHER, WILLIAM, 525 Manhattan Ave., New York City.....	1886
DWIGHT, Dr. JONATHAN, Jr., 2 East 34th St., New York City.....	1886
ELLIOT, DANIEL G., Field Columbian Museum, Chicago, Ill.....	—
FISHER, Dr. ALBERT K., Dept. of Agriculture, Washington, D. C....	—
FOSTER, LYMAN S., 35 Pine Street, New York City.....	1888
GILL, Prof. THEODORE N., Smithsonian Institution, Washington, D. C.....	1883
GRINNELL, Dr. GEORGE BIRD, 'Forest and Stream' Office, New York City.....	1883
HENSHAW, HENRY W., Bureau of Ethnology, Washington, D. C....	1883
LANGDON, Dr. F. W., 65 West 7th St., Cincinnati, O.....	1887
LAWRENCE, NEWBOLD T., 51 Liberty St., New York City.....	1883

¹ Members of the Union and Subscribers to 'The Auk' are requested to promptly notify the publisher of 'The Auk' of any change of address.

* Life Member.

LOOMIS, LEVERETT M., California Acad. Sci., San Francisco, Cala.	1892
LUCAS, FREDERIC A., U. S. Nat. Mus., Washington, D. C.	1892
McILWRAITH, THOMAS, Hamilton, Ontario	—
MEARNS, DR. EDGAR A., U. S. A., Fort Myer, Va., via Washington, D. C.	—
MERRIAM, DR. C. HART, Dept. of Agriculture, Washington, D. C.	—
*MERRILL, DR. JAMES C., U. S. A., Fort Sherman, Idaho	1883
NEHRLING, H., Public Museum, Milwaukee, Wis.	1883
NELSON, E. W., Dept. of Agriculture, Washington, D. C.	1883
PURDIE, HENRY A., Room 36, State House Extension, Boston, Mass.	—
RIDGWAY, ROBERT, Smithsonian Institution, Washington, D. C.	—
ROBERTS, DR. THOMAS S., 1015 Harmon Place, Minneapolis, Minn.	1883
*SAGE, JOHN H., Portland, Conn.	1883
SAUNDERS, WILLIAM E., 188 Dundas St., London, Ontario	1883
*SENNETT, GEORGE B., Am. Mus. Nat. Hist., New York City	1883
SIUFELDT, DR. ROBERT W., U. S. A., Smithsonian Institution, Washington, D. C.	—
STEJNEGER, DR. LEONHARD, Smithsonian Institution, Washington, D. C.	1884
STONE, WITMER, Acad. Nat. Sci., Philadelphia, Pa.	1892
*TRUMBULL, GURDON, 970 Asylum Ave., Hartford, Conn.	1888
WIDMANN, OTTO, Old Orchard, Mo.	1884

HONORARY MEMBERS.

BERLEPSCH, Count HANS VON, Münden, Germany	1890
BLANFORD, DR. WILLIAM T., 72 Bedford Gardens, Kensington, W., London, England	1895
BOCAGE, Prof. J. V. BARBOZA DU, Royal Museum, Lisbon	1883
CABANIS, Prof. DR. JEAN, Alte Jacobsstrasse, 103 a, Berlin	1883
DRESSER, HENRY EELES, Topclyffe Grange, Farnborough, Becken- ham, Kent, England	1883
FINSCH, DR. OTTO, Delminhorst, near Bremen	1883
GÄTKE, HEINRICH, Helgoland, via Bremen	1884
GIGLIOLI, DR. HENRY HILLYER, Director Royal Zoölogical Museum, Florence	1883
GUNDLACH, DR. JUAN, Institute de 2a Enseñanza, Havana, Cuba	1883
HARTLAUB, DR. GUSTAV, Bremen	1883
HUME, ALLAN OCTAVIAN, The Chalet, Kingswood Road, Upper Nor- wood, London, S. E.	1883
MILNE-EDWARDS, Prof. ALPHONSE, Rue Cuvier, 57, Paris	1883
NEWTON, Prof. ALFRED, Magdalene College, Cambridge, Eng.	1883

REICHENOW, Dr. ANTON, Königl. Mus. für Naturkunde, Invaliden Str., 43, Berlin.....	1891
SALVADORI, Prof. Count TOMMASO, Zoöl. Museum, Turin, Italy....	1883
SALVIN, OSBERT, Hawksfold, Fernhurst, Haslemere, England.....	1883
SAUNDERS, HOWARD, 7 Radnor Place, Hyde Park, London, W.....	1884
SCLATER, Dr. PHILIP LUTLEY, 3 Hanover Sq., London, W.....	1883
SHARPE, Dr. RICHARD BOWDLER, British Museum (Natural History), Cromwell Road, London, S. W.....	1883
WALLACE, Prof. ALFRED RUSSEL, Corfe View, Parkstone, Dorset, England.....	1883

CORRESPONDING MEMBERS.

ALFARO, ANASTASIO, Director National Museum, San José, Costa Rica.....	1888
ALTUM, Dr. C. A., Eberswalde, Germany.....	1884
ANDERSON, Dr. JOHN, India Museum, Calcutta.....	1884
BLASIUS, Dr. RUDOLPH, Brunswick, Germany.....	1884
BLASIUS, Dr. WILHELM, Brunswick, Germany.....	1884
BROOKS, W. EDWIN, Mount Forest, Ontario.....	1886
BULLER, Sir WALTER LAWRY, Wellington, New Zealand.....	1883
BUREAU, Dr. LOUIS, École de Médecine, Nantes, France.....	1884
BUTLER, Lieut.-Col. E. A., Brettenham Park, Bildeston, Suffolk, England.....	1884
BÜTTIKOFER, Dr. J., Leyden, Holland.....	1886
CLARKE, WM. EAGLE, Science and Art Museum, Edinburgh.....	1889
COLLETT, Prof. ROBERT, Zoölogical Museum, Christiania, Norway.....	1883
COOPER, Dr. J. G., Haywards, California.....	1884
CORDEAUX, JOHN, Great Cotes, Lincoln, England.....	1884
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Stirling, Scotland.....	1883
DAVID, L'Abbé ARMAND, Rue de Sèvres, 95, Paris.....	1883
DOLE, SANFORD B., Honolulu, Hawaiian Ids.....	1888
DUBOIS, Dr. ALPHONSE, Museum Nat. History, Brussels.....	1884
DUGÈS, Prof. ALFREDO, Colegio del Estado, Guanajuato, Mexico....	1884
ECHE, ADOLPH BACHOFEN VON, Nussdorf, near Vienna.....	1883
FATIO, Dr. VICTOR, Geneva, Switzerland.....	1884
FEILDEN, Lieut.-Col. H. W., West House, Wells, Norfolk, Eng.....	1884
FERRARI-PEREZ, Prof. FERNANDO, Naturalist Mexican Geol. Expl. Commission, Pueblo, Mexico.....	1885
FREKE, PERCY EVANS, Rosemount, Dundrum, Co. Dublin, Ireland..	1883
FÜRBRINGER, Dr. MAX, Jena, Germany.....	1891
GADOW, Dr. HANS, Zoölogical Museum, 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, Keswick Hall, Norwich, England.....	1883
HARTERT, ERNST, Zoölogical Museum, Tring, England.....	1891
HARTING, JAMES EDMUND, 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.....	1888
HOLUB, DR. EMIL, Vienna.....	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., Budleigh Salterton, Devonshire, England.....	1884
LEGGE, WILLIAM V., Cullenswood House, St. Mary's, Tasmania....	1891
LEVERKÜHN, PAUL, Sophia, Bulgaria.....	1890
LYTTLETON, THOMAS, Lord LILFORD, Lilford Hall, Oundle, England.	1889
MACFARLANE, ROBERT, Winnipeg, Manitoba.....	1886
MADARÁSZ, DR. JÚLIUS VON, National Museum, Budapest, Hungary.	1884
MALMGREN, DR. A. J., University, Helsingfors, Finland.....	1884
MENZIER, DR. M., Imperial Society of Naturalists, Moscow.....	1884
MEYER, DR. A. B., Director of the Royal Zool. Museum, Dresden....	1884
MOJSISOVICS, DR. A. VON, Gratz, Austria.....	1884
NAMIYE, M., Tokio.....	1886
NICHOLSON, FRANCIS, Oakfield, Ashley Road, Altrincham, England.	1884
OATES, EUGENE WILLIAM, Mandalay, Burma.....	1884
OUSTALET, DR. EMILE, Jardin des Plantes, 55 Rue de Buffon, Paris.	1888
PALMÉN, Prof. J. A., Helsingfors, Finland.....	1883
PHILIPPI, DR. R. A., Santiago, Chili.....	1884
RADDE, DR. GUSTAV FERDINAND, Tiflis, Russia.....	1884
RAMSEY, E. P., Sydney, New South Wales.....	1884
RINGER, FREDERIC, Nagasaki, Japan.....	1888
SCHALOW, DR. HERMAN, 105 Rathenowerstrasse, Berlin.....	1884
SELYS-LONGSCHAMPS, Baron EDMOND DE, Liège, Belgium.....	1884
SHELLEY, Capt. G. E., 10 Thurloe Square, London, S. W.....	1884
THEEL, DR. HJALMAR, University of Upsala, Upsala, Sweden.....	1884
TRISTRAM, Rev. Canon H. B., The College, Durham, England.....	1884
TSCHUSI ZU SCHMIDHOFFEN, Count VICTOR RITTER VON, Hallein, (Villa Hännenhof), Salzburg, Austria.....	1884
WATERHOUSE, F. H., 3 Hanover Square, London, W.....	1889
ZELEDON, Don JOSÉ C., San José, Costa Rica.....	1884

ASSOCIATE MEMBERS.

ADAMS, STEPHEN J., Cornish, Me.....	1892
ADNEY, E. T., Flushing, N. Y.....	1885
ALLEN, CHARLES ANDREW, Nicasio, Marin Co., Cala.....	1894
ALLEN, FRANCIS H., West Roxbury, Mass.....	1888
ALLEN, WILLIAM G., 1 Edward St., Worcester, Mass.....	1893
AMES, J. H., 85 Bay St., Toronto, Can.....	1895
ARCHER, W. C., 45 Chamber St., N. Y.....	1888
ARNOLD, EDWARD, 126 Van Buren St., Battle Creek, Mich.....	1894
ATHERTON, FRANK IRVING, P. O. Box 60, Los Gatos, Cala.....	1894
ATKINS, JOHN W., Key West, Florida.....	1887
ATKINSON, GEORGE EDGAR, 81 Borden St., Toronto, Can.....	1894
ATTWATER, H. P., San Antonio, Texas.....	1891
AVERILL, C. K., Jr., Bridgeport, Conn.....	1885
AYER, ED. E., 1 Bank St., Chicago, Ill.....	1889
BABBITT, JAMES P., Taunton, Mass.....	1891
BACON, CARRINGTON C., Imboden, Arkansas.....	1890
BACON, SAMUEL E., Jr., 2d National Bank, Erie, Pa.....	1891
BAGG, EGBERT, 191 Genesee St., Utica, N. Y.....	1883
BALL, CARLETON R., Little Rock, Iowa.....	1891
BALL, MISS HELEN AUGUSTA, Worcester, Mass.....	1893
BAILEY, VERNON, Elk River, Minn.....	1887
BAILY, CHARLES E., Malden, Mass.....	1890
BAILY, WILLIAM L., 421 Chestnut St., Philadelphia, Pa.....	1885
BAKER, CARL F., Fort Collins, Colo.....	1893
BAKER, FRANK COLLINS, Acad. Sci., Lincoln Park, Chicago, Ill.....	1894
BANGS, EDWARD APPLETON, 22 Pemberton Sq., Boston, Mass.....	1884
BANGS, OUTRAM, 240 Beacon St., Boston, Mass.....	1884
BANKS, JAMES W., St. John, N. B.....	1887
BARBOUR, Prof. ERWIN H., Univ. of Neb., Lincoln, Nebraska.....	1892
BARLOW, CHESTER, Santa Clara, Cala.....	1894
BARNARD, JOB, 500 5th St., N. W., Washington, D. C.....	1886
BARNES, Hon. R. M., Lacon, Ill.....	1889
BARNEY, EVERETT H., Springfield, Mass.....	1891
BASKETT, JAMES NEWTON, Mexico, Mo.....	1892
BASSETT, HENRY FRANKLAND, Taunton, Mass.....	1895
BATES, ABBY FRANCES CALDWELL, Waterville, Maine.....	1894
BAUR, Dr. G., Univ. of Chicago, Chicago, Ill.....	1892
BAXTER, GEORGE STRONG, Jr., 109 E. 17th St., New York City.....	1894
BEAL, F. E. L., 1633 19th St., N. W., Washington, D. C.....	1887
BEAN, J. BELLFIELD, Nicollet, Minn.....	1892
BEARD, DANIEL C., 110 Fifth Ave., New York City.....	1887
BECK, ROLLO HOWARD, Berryessa, Santa Clara Co., Cala.....	1894
BEERS, HENRY W., Bridgeport, Conn.....	1895

BEHR, EDWARD A., 428 Henry St., Brooklyn, N. Y.....	1892
BELLOWS, ED. D., 215½ 4th St., Jersey City, N. J.....	1889
BENNER, FRANKLIN, 110 2d St., N. Minneapolis, Minn.....	1883
BENNETT, GEO. B., 122 Walnut St., Philadelphia, Pa.....	1889
BENT, ARTHUR CLEVELAND, Taunton, Mass.....	1889
BERGTOLD, DR. W. H., 3213 Champa St., Denver, Colo.....	1889
BERIER, DELAGNEL, Ridgewood, N. J.....	1885
BILL, CHARLES, Springfield, Mass.....	1889
BIRCHFIELD, DR. CHARLES EDWARD, St. Joseph, Mich.....	1895
BISHOP, DR. LOUIS B., 77 Whitney Ave., New Haven, Conn.....	1885
BLACKWELDER, ELIOT, Morgan Park, Cook Co., Ill.....	1895
BOARDMAN, GEORGE A., Calais, Maine.....	1883
BOIES, A. H., Hudson, Mich.....	1890
BOND, FRANK, Cheyenne, Wyoming.....	1887
BOND, HARRY L., Meriden, Iowa.....	1890
BOWERS, LIONEL F., Columbia, Lancaster Co., Pa.....	1894
BOWLES, JOHN HOOPER, Ponkapog, Mass.....	1891
BRACKETT, FOSTER H., Box 2148, Boston, Mass.....	1895
BRADFORD, MOSES B. L., Concord, Mass.....	1889
BRAISLIN, DR. WILLIAM C., 217 St. James Place, Brooklyn, N. Y....	1894
BRANDRETH, FRANKLIN, Sing Sing, N. Y.....	1889
BREWSTER, E. E., Iron Mountain, Mich.....	1893
BRIMLEY, CLEMENT S., Raleigh, N. C.....	1888
BROCK, HENRY HERBERT, M. D., Portland, Me.....	1894
BROKAW, L. W., Carmel, Ind.....	1893
BROOKS, EARLE A., Morgantown, Upshur Co., W. Va.....	1892
BROWN, A. D., Pipestone, Minn.....	1891
BROWN, EDWARD J., 820 20th St., N. W., Washington, D. C.....	1891
BROWN, HERBERT, Tucson, Arizona.....	1885
BROWN, HUBERT H., 22 Collier St., Toronto, Ontario	1889
BROWN, JOHN CLIFFORD, 28 W. 37th St., New York City.....	1888
BROWN, WILMOT W., Jr., Somerville, Mass.....	1892
BROWNE, FRANCIS CHARLES, Framingham, Mass.....	1883
BRUCE, MARY EMILY, Easthampton, Mass.....	1894
BRYAN, WILLIAM ALANSON, State College, Ames, Iowa.....	1894
BRYANT, JOHN A., 1221 Olive St., Kansas City, Mo.....	1893
BRYANT, DR. WM. SAWYER, Cohasset, Mass.....	1893
BUILER, ULYSSE, 129 E. 76th St., New York City.....	1894
BULLEY, REGINALD H., Canton, Ohio.....	1889
BURNETT, WILLIAM L., Fort Collins, Colo.....	1895
BURNS, FRANK L., Berwyn, Chester Co., Pa.....	1891
BURTCH, VERDI, Penn Yan, N. Y.....	1895
BURTON, H. C., 228 South St., New York City.....	1893
BUTLER, AMOS W., Brookville, Ind.....	1885
BUXBAUM, MRS. CLARA E., Lexington Hotel, Chicago, Ill.....	1895
CALL, AUBREY BRENDON, Peterboro, N. H.....	1894
CAMPBELL, ROBERT ARGYLL, Boulder, Colo.....	1894

CANFIELD, J. B., 329 Iraniston Ave., Bridgeport, Conn.....	1893
CARPENTER, CHARLES KNAPP, Ann Arbor, Mich.....	1894
CARRUTH, CHARLES THEODORE, 4 Fayerweather St., Cambridge, Mass.....	1891
CARY, CLINTON DE LA MONTAIGNE, 181 W. 135th St., New York City.....	1894
CASE, CLIFFORD M., 54 Babcock St., Hartford, Conn.....	1892
CASE, RALPH ERNEST, Avon, Conn.....	1894
CAULK, WM. B., Terre Haute, Ind.....	1891
CHAMBERLAIN, CHAUNCY W., 51 Lincoln St., Boston, Mass.....	1885
CHAMBERLAIN, ERNEST, Jubilee, Peoria Co., Ill.....	1893
CHASE, VIRGINIUS H., Wady Petra, Ill.....	1892
CERRIE, GEORGE K., Field Columbian Museum, Chicago, Ill.....	1891
CHUBB, SAMUEL H., 110 W. 124th St., New York City.....	1894
CHURCH, MISS HARRIET DUDLEY, Bourne, Mass.....	1895
CLARK, HUBERT LYMAN, 906 McCulloh St., Baltimore, Md.....	1886
CLARK, JOHN N., Saybrook, Conn.....	1885
CLARK, JOSIAH H., Paterson, N. J.....	1895
CLARKE, Prof. S. F., Williamstown, Mass.....	1890
CLEARWATERS, Rev. JOHN FRED, Indianola, Ill.....	1895
COALE, H. K., 136 Washington St., Chicago, Ill.....	1883
COLBURN, ALBERT E., Mount Vernon, N. Y.....	1891
COLBURN, W. W., Springfield, Mass.....	1889
COLT, WILLIAM C., 59 Pleasant St., Worcester, Mass.....	1892
COMBS, BERTIE LAWRENCE, Hot Springs, Ark.....	1895
COMEAU, NAPOLEON A., Godbout, P. Q.....	1885
CONDIT, DAYTON LORD, St. Anthony Park, Minn.....	1894
CONGDON, HERBERT WHEATON, 194 Clinton St., Brooklyn, N. Y....	1893
CONKLIN, CHARLES E., Roslyn, N. Y.....	1892
CONKLIN, DR. WILLIAM A., 10th Ave. cor. 187th St., New York City.	1885
COOK, ALBERT JOHN, Claremont, Cal.....	1894
COOLEY, ROBERT C., 1st Nat'l Bank Bldg., Springfield, Mass.....	1895
COPE, ALBAN, Hartford, Conn.....	1885
COPE, FRANCIS R., Jr., Philadelphia, Pa.....	1892
CORBETT, HERBERT EDWIN, Pipestone, Minn.....	1894
COUES, DR. WILLIAM PEARCE, Boston, Mass.....	1888
COX, ULYSSES O., Mankato, Mass.....	1894
CRAM, R. J., 26 Hancock Ave., W. Detroit, Mich.....	1893
CRANDALL, C. W., Woodside, Queen's Co., N. Y.....	1891
CRONE, JOHN V., Marathon, Iowa.....	1893
CULYER, Col. JOHN Y., Room 150, Potter Building, New York City.	1890
CURRIE, ROLLA P., 700 T. St., N. W., Washington, D. C.....	1895
CURRIER, EDMONDE SAMUEL, Keokuk, Iowa.....	1894
DAENZER, CARL, St. Louis, Mo.....	1888
DAFFIN, W. H., 5000 Franklin St., Philadelphia, Pa.....	1892
DAGGETT, FRANK S., Pasadena, Cal.....	1889
DAKIN, J. A., Syracuse, N. Y.....	1895

DANA, J. LE ROY, Blackhawk, Colo.....	1889
DANBY, DURWARD E., Custer City, South Dak.....	1895
DANIEL, JOHN W., Jr., Lynchburg, Va.....	1895
DAVIS, DENNIS BARNES, 816 Colfax St., Toledo, Ohio.....	1894
DAVIS, GEORGE A., Mexico, N. Y.....	1890
DAVIS, NATHAN L., Brockport, N. Y.....	1893
DAVISON, J. L., Lockport, Niagara Co., N. Y.....	1885
DAWSON, WILLIAM LEON, Chelan, Wash.....	1895
DEAN, R. H., Tennallytown, Washington, D. C.....	1893
DE HAVEN, ISAAC NORRIS, Ardmore, Pa.....	1893
DELAFIELD, JOSEPH L., 475 Fifth Ave., New York City.....	1888
DENNE, DAVID, 100 St. Francois Xavier St., Montreal, Can.....	1890
DETWILLER, DR. JNO. W., Bethlehem, Pa.....	1891
DEWEY, MISS MARGARET, 168 Pearl St., Springfield, Mass.....	1892
DICKINSON, EDWIN, West Springfield, Mass.....	1885
DICKINSON, JOSEPH A., Gresham, Nebr.....	1894
DICKINSON, JOSEPH EDWARD, Rockford, Ill.....	1894
DICKINSON, W. S., Tarpon Springs, Fla.....	1891
DILLE, FREDERIC M., 611 McPhee Bldg., Denver, Colo.....	1892
DIONNE, C. E., Laval Univ., Quebec, Can.....	1893
DIXON, FREDERIC J., Fairmont, N. J.....	1891
DOERTENBACH, WILLIAM FAUTZ, 226 Main St., Pueblo, Colo.....	1894
DOUGHERTY, Capt. W. E., U. S. A., Hoopa Valley, Cala.....	1890
DOUGLASS, BERT H., Burlington, Kansas.....	1890
DRAKE, LEWIS MARVIN, Blissfield, Mich.....	1894
DURFEE, OWEN, Fall River, Mass.....	1887
DUTCHER, DR. B. H., New York Hospital, New York City.....	1886
DYCHIE, Prof. L. L., Lawrence, Kansas.....	1886
EAMES, DR. EDWIN H., Bridgeport, Conn.....	1888
EASTMAN, HARRY D., Framingham, Mass.....	1891
EATON, ALVAH A., Seabrook, N. H.....	1890
EATON, E. H., Canandaigua, N. Y.....	1895
EDDY, NEWELL A., 615 North Grant St., Bay City, Mich.....	1885
EDGAR, NEWBOLD, 28 E. 39th St., New York City.....	1891
EDSON, JOHN M., New Whatcom, Washington.....	1886
EDWARDS, WILLIAM SEYMOUR, Charleston, W. Va.....	1894
ELDON, CHARLES H., Williamsport, Pa.....	1891
ELROD, Prof. M. J., Illinois Wesleyan Univ., Bloomington, Ill.....	1892
ERWIN, GORDON W., Y. M. C. A., Sedalia, Mo.....	1892
EVANS, DR. EVAN M., Englewood, N. J.....	1888
EVERMANN, Prof. BARTON W., U. S. Fish Comm., Washington, D. C.....	1883
FANNIN, JOHN, Provincial Museum, Victoria, B. C.....	1888
FANNING, JED FRYE, Kingston, Mass.....	1895
FARLEY, JOHN A., Newton, Mass.....	1892
FAXON, DR. WALTER, Mus. Comp. Zool., Cambridge, Mass.....	1891
FERGUSON, CHAUNCEY COFFIN, Merrimac, Mass.....	1894
FERNALD, ROBERT HEYWOOD, 26 Cornell St., Cleveland, Ohio.....	1890

FERRY, JOHN FARWELL, Lake Forest, Lake Co., Ill.....	1894
FIGGINS, JESSE DADE, Kensington, Md.....	1889
FISHER, WILLIAM H., 14 W. North Ave., Baltimore, Md.....	1895
FISHER, WILLIAM HUBBELL, 12 Wiggins Block, Cincinnati, Ohio....	1883
FLANDERS, JAMES WALTER, Wilmot Flat, N. H.....	1894
FLEMING, JAMES H., Toronto, Can.....	1893
FLINT, HARRY W., Yale National Bank, New Haven, Conn.....	1888
FLINT, WILLIAM R., Oakland, Cal.....	1890
FLOOD, OLIVER D., Malden, Mass.....	1893
FLOYD, HARRY WEBB, 2 Verona Place, Brooklyn, N. Y.....	1892
FORBUSH, EDWARD H., Malden, Mass.....	1887
FOSTER, FRANCIS APTHORP, Cambridge, Mass.....	1893
FOWLER, FREDERICK HALL, Fort Logan, Colo.....	1892
FOWLER, Capt. J. L., 2d Cavalry U. S. A., Fort Logan, Colo.....	1892
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....	1883
FRANCIS, NATHANIEL ATWOOD, Brookline, Mass.....	1893
FROST, ALBERT H., 255 W. 74th St., New York City.....	1893
FUERTES, LOUIS AGASSIZ, Ithaca, N. Y.....	1891
FULLER, CHARLES ANTHONY, Brookline, Mass.....	1894
GALE, DENIS, Gold Hill, Boulder Co., Colo.....	1886
GARCELON, FREDERICK ALMONT, Auburn, Me.....	1895
GARMAN, Prof. H., State College, Lexington, Ky.....	1893
GARNIER, RALPH LEE, 8 Stockton St., Los Angeles, Cal.....	1894
GAULT, BENJAMIN T., Glen Ellyn, DuPage Co., Ill.....	1885
GILBERT, Prof. CHARLES H., Stanford University, Cal.....	1892
GILLET, LOUIS B., 131 E. 76th St., New York City.....	1895
GILMAN, ARTHUR SCOTT, 5 Waterhouse St., Cambridge, Mass.....	1895
GLEASON, Rev. HERBERT W., 728 E. 18th St., Minneapolis, Minn..	1894
GOODALE, Dr. JOSEPH LINCOLN, 3 Fairfield St., Boston, Mass.....	1885
GOULD, JOSEPH E., Dennison, Ohio.....	1889
GRANGER, WALTER W., Am. Mus. Nat. Hist., New York City.....	1891
GRANT, JNO. B., Flushing, N. Y.....	1890
GREEN, MORRIS M., 706 E. Fayette St., Syracuse, N. Y.....	1886
GREENE, I. C., Fitchburg, Mass.....	1891
GREGG, Dr. WILLIAM H., Port Chester, N. Y.....	1883
GRINNELL, JOSEPH, Pasadena, Cal.....	1894
HAHN, Rev. BENJAMIN DAVIESE, 266 Union St., Springfield, Mass...	1894
HALES, HENRY, Ridgewood, N. J.....	1890
HAM, JUDSON BAXTER, Lyndon Centre, Vt.....	1894
HAMELDT, A., Ottawa, Ill.....	1892
HAMLIN, GEORGE L., Bethel, Conn.....	1893
HANCOCK, Dr. JOSEPH LANE, Michigan Ave., Chicago, Ill.....	1894
HARGITT, Prof. CHARLES W., 904 E. Genesee St., Syracuse, N. Y...	1892
HARDY, MANLY, Brewer, Maine.....	1883
HARRIS, WILLIAM C., Utica, N. Y.....	1894
HARTZELL, Prof. JOSEPH CULVER, Orangeburg, S. C.....	1892
HASBROUCK, Dr. EDWIN M., 2510 14th St., N. W., Washington, D. C..	1887

HATCH, JESSE MAURICE, Escondido, Cala.....	1894
HAVEMEYER, H. O., Jr., Mahwah, N. J.....	1893
HAZARD, R. G., Peace Dale, R. I.....	1885
HEAPHY, DR. LAWRENCE F., 104 E. 26th St., New York City.....	1894
HECKER, FREDERICK C., Noroton, Conn.....	1893
HECKER, GEORGE E., Noroton, Conn.....	1893
HEDGES, CHARLES F., New Haven, Conn.....	1891
HEIMSTREET, DR. T. B., 14 Division St., Troy, N. Y.....	1888
HELME, ARTHUR H., Miller's Place, Suffolk Co., N. Y.....	1888
HENDRICKSON, W. F., 130 12th St., Long Island City, N. Y.....	1885
HENNING, CARL FRITZ, Boone, Iowa.....	1892
HICKS, BENJAMIN D., Old Westbury, N. Y.....	1892
HIGGINS, HENRY C., Cincinnati, N. Y.....	1892
HINE, J. BRAINARD, East Onondaga, N. Y.....	1895
HINE, MRS. JANE L., Sedan, Ind.....	1890
HITCHCOCK, FRANK HENRY, Dept. of Agriculture, Washington, D.C.	1891
HOAG, BENJAMIN, Stephentown, N. Y.....	1892
HOFFMAN, RALPH, Belmont, Mass.....	1893
HOLCOMB, LEON C., 14 Howard St., Springfield, Mass.....	1893
HOLLISTER, NED, Delavan, Wis.....	1894
HOLMES, F. H., Berryessa, Cala.....	1893
HOLZNER, FRANK N., San Diego, Cala.....	1893
HOMER, F. L., West Farmington, Ohio.....	1893
HOOPES, JOSIAH, West Chester, Pa.....	1889
HOOVER, WALTER W., Wellsville, Pa.....	1895
HORNADAY, W. T., 53 Erie Co. B'k Bldg., Buffalo, N. Y.....	1888
HOUGH, ROMEYN B., Lowville, N. Y.....	1883
HOWE, C. P., Waukesha, Wis.....	1891
HOWE, REGINALD HEBER, Jr., Sta. D., Boston, Mass.....	1899
HOWELL, ARTHUR H., Putnam Ave., Brooklyn, N. Y.....	1885
HOYLE, CHARLES E., West Millbury, Mass.....	1889
HOYT, WILLIAM H., Stamford, Conn.....	1888
HUBBARD, MRS. SARA A., 39 33rd St., Chicago, Ill.....	1891
HUGHES, DR. WILLIAM E., 3726 Baring St., Philadelphia, Pa.....	1891
HULL, WALTER B., Box 47, Milwaukee, Wis.....	1889
HUNN, JOHN T. SHARPLESS, Plainfield, N. J.....	1895
HUNTER, MISS SUSAN MORRISON, Newport, R. I.....	1894
HURD, THEODORE D., Riverside, Cala.....	1890
HVOSLEF, DR. J. C., Lanesboro, Minn.....	1885
INGALLS, CHARLES E., East Templeton, Mass.....	1885
INGERSOLL, ALBERT M., 818 5th St., San Diego, Cala.....	1885
INGERSOLL, JOSEPH CARLETON, Bowie, Md.....	1895
INGRAHAM, D. P., Beulah, Colo.....	1889
IRVING, JOHN, 550 Park Ave., New York City.....	1894
ISHAM, C. B., Am. Mus. Nat. Hist., New York City.....	1891
JACKSON, THOMAS H., West Chester, Pa.....	1888
JACOBS, J. WARREN, Waynesburg, Pa.....	1889

JAMES, HOWARD K., 225 W. 38th St., New York City.....	1888
JEFFRIES, WILLIAM AUGUSTUS, 78 Devonshire St., Boston, Mass.....	1883
JESURUN, DR. MORTIMER, Douglas, Wyoming.....	1890
JOHNSON, ALBERT I., Des Moines, Iowa.....	1885
JOHNSON, A. W., Upper Lake, Lake Co., Cala.....	1893
JOHNSON, FRANK E., Parkville, Kings Co., N. Y.....	1888
JOHNSON, JAMES HOWARD, Mansfield, Mass.....	1894
JOHNSON, WALTER A., Galesburg, Ill.....	1895
JOHNSON, WM. S., Boonville, N. Y.....	1893
JOHNSTON, CHARLES HAVEN LADD, Cambridge, Mass.....	1894
JONES, LYNDS, College Museum, Oberlin, Ohio.....	1888
JONES, PROF. MARCUS E., Salt Lake City, Utah.....	1890
JORDAN, A. H. B., Johnsonburg, Pa.....	1888
JORDAN, PROF. DAVID STARR, Stanford University, Cala.....	1885
JUDD, ELMER T., Cando, No. Dak.....	1895
JUDD, SYLVESTER D., Dept. of Agriculture, Washington, D. C.....	1893
JUSTICE, WILLIAM W., Jr., Germantown, Philadelphia, Pa.....	1895
KELLOGG, VERNON L., Stanford University, Cala.....	1888
KENDALL, W. C., U. S. Fish Commission, Washington, D. C.....	1886
KENNARD, FREDERIC HEDGE, Brookline, Mass.....	1892
KENT, PROF. WALTER F., Lockport, N. Y.....	1893
KEYSER, REV. LEANDER S., Dayton, Ohio.....	1891
KIMBALL, R. E., 631 G St., N. W., Washington, D. C.....	1893
KING, GEORGE GORDON, Newport, R. I.....	1888
KIRKPATRICK, H. C., Meadville, Pa.....	1891
KIRKWOOD, FRANK C., P. O. Box 364, Baltimore, Md.....	1892
KNIGHT, ORA WILLIS, Bangor, Me.....	1893
KNOWLTON, F. H., U. S. Nat. Mus., Washington, D. C.....	1883
KOCH, PROF. AUGUST, Williamsport, Pa.....	1891
KOCH, FREDERIC W., Univ. Cala., Berkeley, Cala.....	1891
KOHN, GUSTAVE, 14 Carondelet St., New Orleans, La.....	1886
KOUMLY, REV. PIRMIN M., St. Benedict's College, Atchison, Kan...	1892
KRAEMER, FREDERICK L., Box 198, Williamsport, Pa.....	1893
KROM, STEPHEN ARTHUR, Plainfield, N. J.....	1894
KUMLIEN, LUDWIG, Milton, Wis.....	1895
LADD, SAMUEL B., West Chester, Pa.....	1889
LAHEE, EUGENE H., Alton, Ill.....	1893
LANGDON, EDWIN, Central National Bank, New York City.....	1891
LANO, ALBERT, Madison, Minn.....	1890
LANTZ, PROF. D. E., Manhattan, Kansas.....	1885
LAWRENCE, HIRAM V., 203 Bedford Ave., Brooklyn, N. Y.....	1895
LAWRENCE, ROBERT B., Flushing, N. Y.....	1883
LAWRENCE, ROBERT HOE, 45 William St., New York City.....	1890
LEVINGS, GLENN V. B., 117 W. 58th St., New York City.....	1892
LEWIS, WILLIAM H., Pawtucket, R. I.....	1890
LINSKILL, DAVID J., Plymouth, Pa.....	1891
LIVERMORE, J., Newport, R. I.....	1893

LONG, H. B., Worcester, Mass.....	1889
LOOMIS, JOHN A., Paint Rock, Concho Co., Texas.....	1887
LORING, J. ALDEN, Dept. of Agriculture, Washington, D. C.....	1889
LOWE, WILLOUGHBY P., Pueblo, Colo.....	1893
LUHRMAN, JOHN, Jr., 158 Pacific Ave., Jersey City, N. J.....	1893
LUSK, RICHARD D., Fort Huachuca, Ariz.....	1894
MACDOUGALL, GEO. R., 88 Wall St., New York City.....	1890
MACKAY, DR. A. H., Halifax, Nova Scotia.....	1885
MACKAY, GEORGE H., Nantucket, Mass.....	1890
MACOUN, Prof. JOHN, Geol. and Nat. Hist. Surv., Ottawa, Ontario.....	1883
MAILLIARD, JOHN W., 323 California St., San Francisco, Cal.....	1895
MAILLIARD, JOSEPH, San Geronimo, Cal.....	1895
MANN, Rev. ALBERT, 132 E. Hanover St., Trenton, N. J.....	1894
MARCY, Prof. OLIVER, Evanston, Ill.....	1892
MARIS, WILLARD LORRAINE, Newton, Bucks Co., Pa.....	1894
MARSH, DANIEL J., Springfield, Mass.....	1894
MASTERMAN, ELMER ELLSWORTH, New London, Ohio.....	1895
MAXON, WILLIAM RALPH, 132 Main St., Oneida, N. Y.....	1894
MAY, FRANK DWIGHT, Jr., 17 Huntington St., Hartford, Conn.....	1894
MAYNARD, COLTON, 1407 15th St., N. W., Washington, D. C.....	1895
MCCOOK, PHILIP JAMES, Knoxville, Ill.....	1895
MCCORMICK, LOUIS M., Glen Island, N. Y.....	1892
MCGREGOR, R. C., Palo Alto, Cal.....	1889
MCILHENNY, EDWARD AVERY, Avery, La.....	1894
McLAIN, ROBERT BAIRD, Elm Grove, W. Va.....	1893
MAITLAND, ROBERT L., 10 E. 35th St., New York City.....	1889
MALI, CHARLES M., 93 Willow St., Brooklyn, N. Y.....	1889
MARSHALL, ALFRED, 59 South Canal St., Chicago, Ill.....	1886
MASON, EDWARD CAMPBELL, 76 Johnsons Park, Buffalo, N. Y.....	1888
MELZER, JAMES P., Milford, N. H.....	1891
MERRIAM, Miss FLORENCE A., 1919 16th St., N.W., Washington, D.C.....	1885
MERRILL, HARRY, Bangor, Maine.....	1883
METCALFE, WILLIAM C., 21 Cortlandt St., New York City.....	1886
MILLER, GERRIT SMITH, Jr., Peterboro', N. Y.....	1886
MILLER, HARRY EDWARD, Derby Conn.....	1892
MILLER, JAMES HENRY, Lowville, N. Y.....	1894
MILLER, Mrs. OLIVE THORNE, 628 Hancock St., Brooklyn, N. Y.....	1887
MILLS, R. WALTER, Webster Groves, Mo.....	1893
MITCHELL, WALTON I., 534 Summit Ave., St. Paul, Minn.....	1893
MOORE, J. PERCY, Univ. of Pa., Philadelphia, Pa.....	1886
MORCOM, G. FREAN, 328 So. Broadway, Los Angeles, Cal.....	1886
MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa.....	1887
MORRIS, ROBERT O., Springfield, Mass.....	1888
MORRISON, GEORGE A., Fox Lake, Wis.....	1891
MUMMERY, WALTER S., Flint, Mich.....	1895
MURDOCH, JOHN, Rock, Mass.....	1883
MURPHY, Prof. EUGENE EDMUND, Athens, Ga.....	1893

NACHTRIEB, Prof. HENRY F., Univ. of Minn., Minneapolis, Minn....	1892
NASH, H. W., Pueblo, Colorado.....	1892
NEAL, HERBERT VINCENT, 31 Holyoke St., Cambridge, Mass.....	1894
NICHOLS, EUGENE C., Flushing, N. Y.....	1895
NICHOLS, HOWARD GARDNER, Alabama City, Ala.....	1892
NICHOLS, J. M., Peabody, Mass.....	1890
NISWANDER, Prof. F. J., Univ. of Wyoming, Laramie, Wy.....	1893
NORRIS, GUY BRUNAUGH, Garden City, Kans.....	1894
NORRIS, Rev. JAMES AVERY, Hastings-on-Hudson, N. Y.....	1894
NORRIS, J. PARKER, 723 Walnut St., Philadelphia, Pa.....	1886
NORTON, ARTHUR H., Westbrook, Maine.....	1890
NORTON, ARTHUR HENRY WHITELEY, San Antonio, Texas.....	1894
NORTON, RICHARD, Cambridge, Mass.....	1888
OBERHOLSER, HARRY C., Dept. of Agriculture, Washington, D. C....	1888
OLDFIELD, W. A., Port Sanilac, Mich.....	1891
O'NEIL, EDWARD, Sewickley, Allegheny Co., Pa.....	1893
ORTH, GEORGE S., 406 S. Hiland Ave., Pittsburgh, Pa.....	1892
OSBORN, CHASE SALMON, Sault Ste. Marie, Mich.....	1893
OSBORNE, JOHN LANG, Manchester, N. H.....	1894
OSBURN, Rev. WILLIAM, Nashville, Tenn.....	1890
OSGOOD, WILFRED H., Willcox, Cochise Co., Ariz.....	1893
OWEN, VIRGIL WILLIAMS, P. O. Box 774, Los Angeles, Cala.....	1894
PAINE, AUGUSTUS G., Jr., 47 W. 45th St., New York City.....	1886
PALMER, E. L., New Haven, Conn.....	1891
PALMER, Dr. THEODORE S., Dept. of Agriculture, Washington, D. C....	1888
PALMER, WM., U. S. Nat. Mus., Washington, D. C.....	1888
PANNEPACKER, D. E., 2550 North 12th St., Philadelphia, Pa.....	1888
PARK, J. T., Jackson, Miss.....	1890
PARKER, J. GRAFTON, Jr., 100 Washington St., Chicago, Ill.....	1894
PEABODY, Rev. P. B., St. Vincent, Minn.....	1891
PEABODY, WILLIAM RODMAN, Cambridge, Mass.....	1890
PEACOCK, WILLIAM F., Chico, Butte Co., Cala.....	1888
PENNOCK, CHARLES J., Kennett Square, Chester Co., Pa.....	1888
PERKINS, CHARLES E., Hartford, Conn.....	1888
PERNOT, E. A., Granger, Benton Co., Oregon.....	1891
PETERSON, J. P., West Denmark, Polk Co., Wis.....	1885
PHELPS, WILLIAM HENRY, Cambridge, Mass.....	1895
PHILLIPS, A. H., Princeton, N. J.....	1891
PIERCE, A. K., Renovo, Pa.....	1891
PIERS, HARRY, "Stanyan," Willow Park, Halifax, N. S.....	1891
PLEASANTS, J. H., Jr., 606 Cathedral St., Baltimore, Md.....	1888
POMEROY, HARRY KIRKLAND, P. O. Box 575, Kalamazoo, Mich.....	1894
POPENOE, Prof. E. A., Manhattan, Kan.....	1886
PORTER, LOUIS H., Yale Univ., New Haven, Conn.....	1893
POTTER, RAYMOND B., Nyack, N. Y.....	1895
POWERS, WILLIAM LINCOLN, Gardiner, Maine.....	1895
PRAEGER, WILLIAM E., Keokuk, Iowa.....	1892

PRATT, REV. GEORGE B., 61 Lallin St., Chicago, Ill.....	1895
PREBLE, EDWARD A., Dept. of Agriculture, Washington, D. C.....	1892
PRENTISS, D. W., Jr., Washington, D. C.....	1890
PRICE, WILLIAM W., Stanford University, Cala.....	1893
PRIME, REV. WENDELL, 38 Park Row, New York City.....	1889
PURDY, JAMES B., Plymouth, Mich.....	1893
RAINE, WALTER, 181 Bleeker St., Toronto, Ontario.....	1889
RALPH, DR. WILLIAM L., 26 Court St., Utica, N. Y.....	1888
RANN, MRS. MARY L., Manchester, Iowa.....	1893
RAUB, DR. M. W., Lancaster, Pa.....	1890
RATHBUN, FRANK R., 42½ Franklin St., Auburn, N. Y.....	1883
RATHBUN, SAMUEL F., Seattle, Wash.....	1893
RAWSON, CALVIN LUTHER, Norwich, Conn.....	1885
READ, ALBERT M., 1140 15th St., N. W., Washington, D. C.....	1895
REDINGTON, ALFRED P., Santa Barbara, Cala.....	1890
REED, J. HARRIS, Beverly, N. J.....	1890
REED, HOWARD S., 1320 Gaylord St., Denver, Colo.....	1894
RENWICK, FRANK H., Seattle, Wash.....	1893
RHOADS, CHARLES J., Bryn Mawr, Pa.....	1895
RHOADS, SAMUEL N., Haddonfield, N. J.....	1885
RICHARDS, JOHN BION, 10 Barnaby St., Fall River, Mass.....	1888
RICHARDSON, W. M., Am. Mus. Nat. Hist., New York City.....	1891
RICHMOND, CHARLES W., 1307 T St., N. W., Washington, D. C.....	1888
RICKER, EVERETT WILDER, P. O. Box 5083, Boston, Mass.....	1894
RIDGWAY, JOHN L., U. S. Geol. Surv., Washington, D. C.....	1890
RIKER, CLARENCE B., Maplewood, N. J.....	1885
RIVES, DR. WILLIAM C., 22 W. 33d St., New York City.....	1885
ROBBINS, LINVILLE WADSWORTH, Gardiner, Me.....	1895
ROBBINS, WILLIAM A., 178 Garfield Place, Brooklyn, N. Y.....	1888
ROBINS, JULIA STOCKTON, 114 S. 21st St., Philadelphia, Pa.....	1895
ROBERTS, GEORGE W., West Chester, Pa.....	1891
ROBERTS, W. F., 1421 G St., N. W., Washington, D. C.....	1888
RODDY, PROF. H. JUSTIN, Millersville, Pa.....	1891
ROOD, MRS. E. IRENE, Englewood, Cook Co., Ill.....	1893
ROOSEVELT, HON. THEODORE, Oyster Bay, Queens Co., N. Y.....	1888
ROTH, PAUL WAGNER, Greenville, Pa.....	1895
ROTZELL, DR. W. E., Narberth, Pa.....	1893
ROWLAND, RUSSELL STURGIS, Ann Arbor, Mich.....	1895
ROWLAND, THOMAS, 182 6th Ave., New York City.....	1890
ROWLEY, JOHN, JR., Am. Mus. Nat. Hist., New York City.....	1889
ROZYCKI, STEPHEN, Navy Dept., Washington, D. C.....	1894
RUSSELL, GEORGE C., Erie, Pa.....	1888
RUSSELL, ROY, Kokomo, Indiana.....	1891
RUSSELL, WILLIAM BLACK, Fiskdale, Mass.....	1893
SAGE, HENRY M., Albany, N. Y.....	1885
SARGENT, HARRY B., 41 W. 82d St., New York City.....	1892
SAVAGE, DAVID LEWIS, Salem, Iowa.....	1894

SAVAGE, JAMES, 134 Abbott St., Buffalo, N. Y.....	1895
SCHALER, JOHN, Stamford, Conn.....	1893
SCHRAGE, E. B., Pontiac, Mich.....	1895
SCHURR, THEODORE A., Pittsfield, Mass.....	1888
SCHWAB, REV. LAWRENCE H., 101 Lawrence St., New York City....	1892
SCOTT, W. L., 74 Sparks St., Ottawa, Ontario.....	1883
SCROGGS, DR. G. A., Tempe, Ariz.....	1891
SCUDDER, BRADFORD A., Taunton, Mass.....	1893
SHARPLESS, ROBERT P., Elgin, Ill.....	1894
SHEARER, AMON R., Wallaceville, Chambers Co., Texas.....	1893
SHEPPARD, EDWIN, Acad. Nat. Sci., Philadelphia, Pa.....	1892
SHERRATT, W. J., 263 North 2d St., Philadelphia, Pa.....	1891
SHOEMAKER, FRANK H., Hampton, Iowa.....	1895
SHORES, DR. E. L., West Bridgewater, Mass.....	1883
SHORT, ERNEST H., Chili, N. Y.....	1891
SHRYOCK, WILLIAM A., 823 N. Broad St., Philadelphia, Pa.....	1893
SKINNER, FRANCIS B., Rockville, Conn.....	1894
SLADE, JOHN A., 1134 Herkimer St., Brooklyn, N. Y.....	1888
SMALL, ALBERTO WILLIAM, Antrim, N. H.....	1895
SMITH, CLARENCE A., 182 Fifth Avenue, New York City.....	1889
SMITH, HORACE G., 2918 Lafayette St., Denver, Colo.....	1888
SMITH, DR. HUGH M., 1248 New Jersey Ave., Washington, D. C....	1886
SMITH, JAMES E., East Killingly, Conn.....	1889
SMITH, S. SIDNEY, 59 Wall St., New York City.....	1888
SMYTH, PROF. ELLISON A., Jr., Agr. and Mech. Coll., Blacksburg, Va..	1892
SNYDER, WILL EDWIN, Beaver Dam, Wis.....	1895
SORNBORGER, JEWELL D., Cambridge, Mass.....	1888
SOUTHWICK, E. B., Arsenal Bldg., Central Park, New York City....	1888
SPAULDING, FRED. B., Lancaster, N. H.....	1894
SPELMAN, HENRY MUNSON, 62 Sparks St., Cambridge, Mass.....	1883
SPRAGUE, JOHN C., 257 W. 74th St., New York City.....	1891
SPRATT, CHESMAN CHADWICK, Richmond, Maine.....	1894
STANTON, PROF. J. Y., Bates College, Lewiston, Me.....	1883
STEERE, PROF. J. B., Ann Arbor, Mich.....	1890
STEERE, JOSEPH H., Sault Ste. Marie, Mich.....	1894
STEPHENS, F., Witch Creek, San Diego Co., Cal.....	1883
STEPHENSON, MRS. LOUISE MCGOWN, Helena, Ark.....	1894
STICKNEY, MYRON WILDER, 62 George St., Providence, R. I.....	1895
STOEY, W. W., Harrisburg, Pa.....	1891
STONE, CLARENCE FREEDOM, Branchport, N. Y.....	1894
STONE, DWIGHT D., Lansing, N. Y.....	1891
STONEBURN, FRED H., Newark, N. J.....	1893
STREATOR, CLARK P., Dept. of Agriculture, Washington, D. C....	1889
STREEKER, JOHN KERN, Jr., Waco, Texas.....	1894
STRONG, REUBEN M., Oberlin, Ohio.....	1889
STUDER, JACOB HENRY, 114 Fifth Ave., New York City.....	1888
SWINBURNE, JOHN, Guernsey, England.....	1887

TALBOT, D. H., Sioux City, Iowa.....	1885
TATLOCK, JOHN, JR., Mutual Life Ins. Co., New York City.....	1887
TAYLOR, ALEXANDER O'DRISCOLL, 124 Bellevue Ave., Newport, R. I. 1888	
TAYLOR, H. H., 63 Park Place, Bridgeport, Conn.....	1893
TEST, FREDERICK CLEVELAND, Dept. of Agriculture, Wash- ington, D. C.....	1892
THOMAS, JOHN, Sharon, Pa.....	1895
THOMPSON, ERNEST E., 86 Howard St., Toronto, Can.....	1883
THOMPSON, FRANK J., Zoölogical Garden, Philadelphia, Pa.....	1885
THOMSON, Prof. GEORGE S., Los Angeles, Cal.....	1892
THORNE, Capt. PLATTE M., 22d Inf. U. S. A., 102 Spring St., Roch- ester, N. Y.....	1885
THURBER, E. CARLETON, Alhambra, Cal.....	1886
TODD, LOUIS M., Calais, Me.....	1887
TODD, W. E. CLYDE, Dept. of Agriculture, Washington, D. C.....	1890
TOPPAN, GEORGE L., 294 Newbury St., Boston, Mass.....	1886
TORREY, BRADFORD, Wellesley Hills, Mass.....	1883
TOWNSEND, CHARLES H., U. S. Fish Comm., Washington, D. C.....	1883
TOWNSEND, WILMOT, Bay Ridge, N. Y.....	1894
TREAT, WILLARD E., Silver Lane, Conn.....	1885
TROMBLEY, JEROME, Petersburg, Mich.....	1885
TROTTER, Dr. SPENCER, Swarthmore College, Swarthmore, Pa.....	1888
TROVILLION, Dr. E. B., Gold Hill, Colo.....	1893
TUTTLE, Dr. CARL, Berlin Heights, Ohio.....	1890
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN DENBURG, JOHN, Acad. Sci., San Francisco, Cal.....	1893
VAN WINKLE, EDMUND, Vans Harbor, Mich.....	1894
VAUGHAN, CLIFFORD WHEATON, 47 W. 83d St., New York City.....	1894
VELIE, Dr. J. W., St. Joseph, Mich.....	1886
VILARO, Dr. JUAN, Havana Univ., Havana, Cuba.....	1888
VOORHEES, CLARK G., 64 W. 39th St., New York City.....	1888
WALCOTT, ROBERT, 11 Waterhouse St., Cambridge, Mass.....	1893
WALKER, Dr. R. L., Carnegie, Pa.....	1888
WALL, EDWARD, San Bernardino, Cal.....	1894
WALTER, HERBERT EUGENE, 402 Center St., Chicago, Ill.....	1894
WARREN, Dr. B. H., Dept. of Agriculture, Harrisburg, Pa.....	1885
WARREN, OSCAR BIRD, Palmer, Mich.....	1892
WATERS, EDWARD STANLEY, Holyoke, Mass.....	1894
WATKINS, L. WHITNEY, Manchester, Mich.....	1894
WEBSTER, FREDERIC S., 106 E. 23d St., New York City.....	1886
WEBB, WALTER F., Albion, N. Y.....	1891
WEEKS, DAVID FRANKLIN, Portland, Oregon.....	1894
WEIDMAN, JOE, Ames, Iowa.....	1893
WEST, LEWIS H., Roslyn, Queens Co., N. Y.....	1887
WEST, SAMUEL H., Flushing, Queens Co., N. Y.....	1889
WHITE, FRANCIS BEACH, Cambridge, Mass.....	1891
WHITAKER, WILLIAM LINCOLN, Frankford P. O., Philadelphia, Pa...	1894

WHOLEY, W. N., 204 Brady Ave., Baltimore, Md.....	1891
WICKHAM, H. H., Beaver, Pa.....	1890
WICKS, M. L. Jr., Los Angeles, Cala.....	1890
WILBUR, ADDISON P., Canandaigua, N. Y.....	1895
WILCOX, T. FERDINAND, 115 W. 75th St., New York City.....	1895
WILDE, MARK L. C., Camden, N. J.....	1893
WILLIAMS, DR. HENRY SMITH, 66 W. 84th St., New York City..	1893
WILLIAMS, J. BICKERTON, 116 University St., Montreal, Can.....	1889
WILLIAMS, ROBERT S., Columbia Falls, Montana.....	1888
WILLIAMS, W. J. B., Holland Patent, N. Y.....	1893
WILSON, SIDNEY S., St. Joseph, Mo.....	1895
WILSON, WM. EDWARD, 387 Olney St., Providence, R. I	1894
WINTLE, ERNEST D., 11 Hospital St., Montreal, Can.....	1887
WOOD, A. H., Painted Post, N. Y.....	1887
WOODRUFF, FRANK M., Acad. Sci., Lincoln Park, Chicago, Ill..	1894
WOODRUFF, LEWIS B., 14 East 68th St., New York City.....	1886
WOODS, WILLIAM J., State Bank Bldg., Richmond, Va.....	1892
WOODWORTH, MRS. NELLY HART, St. Albans, Vt.....	1894
WORCESTER, Prof. DEAN C., Ann Arbor, Mich.....	1895
WORTHEN, CHARLES K., Warsaw, Ill	1891
WORTHINGTON, R. B., Dedham, Mass.	1893
WORTHINGTON, WILLIS W., Shelter Island, Suffolk Co., N. Y.....	1889
WRIGHT, FRANK S., 51 Genesee St., Auburn, N. Y.....	1894
WRIGHT, MRS. MABEL OSGOOD, Fairfield, Conn.....	1895
WRIGHT, SAM., Conshohocken, Pa.....	1895
YORKE, Dr. F. HENRY, Hallock, Minn.....	1891
YOUNG, CURTIS CLAY, 395 Clermont Ave., Brooklyn, N. Y.....	1891
YOUNG, HENRY LATIROP, Poughkeepsie, N. Y.....	1894
ZWARG, EMIL, Marysville, Cala.....	1893

DECEASED MEMBERS.

ACTIVE MEMBERS.

Date of Death.

BAIRD, SPENCER FULLERTON	Aug. 19, 1887
GOSS, N. S.....	March 10, 1891
HOLDER, JOSEPH B.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
WHEATON, JOHN M.....	Jan. 28, 1887

HONORARY MEMBERS.

BURMEISTER, HERMANN.....	May 1, 1892
GURNEY, JOHN HENRY.....	April 20, 1890
HUXLEY, THOMAS H.....	June 29, 1895

KRAUS, FERDINAND.....	Sept. 15, 1890
LAWRENCE, GEORGE N.....	Jan. 17, 1895
PARKER, WILLIAM KITCHEN.	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SCHLEGEL, HERMANN	Jan. 17, 1884
SEEBOHM, HENRY.....	Nov. 26, 1895
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING MEMBERS.

BALDAMUS, EDUARD.....	Oct. 30, 1893
BLAKISTON, THOMAS W.....	Oct. 15, 1891
BOGDANOW, MODEST N.....	March 4, 1888
HAAST, JULIUS VON.....	Aug. 15, 1887
HARGITT, EDWARD.....	March 19, 1895
HOMER, E. F. VON.....	May 31, 1889
MARSHALL, A. F.....	Oct. 11, 1887
MIDDENDORFF, ALEXANDER THEODOR VON.....	Jan. 28, 1894
PREJEVALSKI, N. M.....	Oct. 20, 1887
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888
SCHRENCK, LEOPOLD VON.....	Jan. 20, 1894
SEVERTZOW, N.....	Feb. 8, 1885
STEVENSON, HENRY.....	Aug. 18, 1888
WHARTON, HENRY T.....	Sept. —, 1895

ASSOCIATE MEMBERS.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ATKINS, H. A.....	May 19, 1885
EVERY, WILLIAM CUSHMAN.....	March 11, 1894
BECKHAM, CHARLES WICKLIFFE.....	June 8, 1888
BOLLES, FRANK.....	Jan. 10, 1894
BREESE, WILLIAM L.....	Dec. 7, 1889
CAIRNS, JOHN S.....	June 10, 1895
CORNING, ERASTUS, JR.....	April 9, 1893
COE, W. W.....	April 26, 1885
ELLIOTT, S. LOWELL.....	Feb. 11, 1889
FAIRBANKS, FRANKLIN.....	April 24, 1895
GESNER, A. H.....	April 30, 1895
GOSS, BENJAMIN F.....	July 6, 1893
HOADLEY, FREDERIC H.....	Feb. 26, 1895
HOWLAND, JOHN SNOWDON.....	Sept. 19, 1885
JENKS, JOHN W. P.....	Sept. 27, 1894
JOY, PIERRE LOUIS.....	March 22, 1894

KUMLIEN, THURE.....	Aug. 5, 1888
LINDEN, CHARLES.....	Feb. 3, 1888
MABBETT, GIDEON.....	Aug. 15, 1890
MINOT, HENRY DAVIS.....	Nov. 13, 1890
NORTHROP, JOHN L.....	June 26, 1891
PARK, AUSTIN F.....	Sept. 22, 1893
RAGSDALE, GEO. H.....	March 25, 1895
RICHARDSON, JENNESS.....	June 24, 1893
SLATER, JAMES H.....	Feb. —, 1895
SMALL, EDGAR A.....	April 24, 1884
STOWE, W. H.....	March —, 1895
VENNOR, H. G.	June 8, 1884
WILLARD, SAMUEL WELLS.....	May 24, 1887
WOOD, WILLIAM.....	Aug. 9, 1885



Geo. N. Lawrence.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XIII.

JANUARY, 1896.

NO. I.

IN MEMORIAM: GEORGE NEWBOLD LAWRENCE.¹

Born, 20th Oct., 1806. Died, 17th Jan., 1895.

BY D. G. ELLIOT, F. R. S. E.

"To him who in the love of Nature holds
Communion with her visible forms, she speaks
A various language,"

and none can understand her rythmic lines so well as he who has taken the denizens of the forest and the fields into intimate fellowship with himself, and gained them for his own familiar friends. With such a one Nature holds especial converse, and unfolds to him the secrets hidden from all ordinary eyes. The way of a serpent on a rock, and of an eagle in the air, the wisest of men confessed he was unable to understand, and yet by many, in the closing years of this nineteenth century, profiting by their own, and the labors of those who have preceded them, in the close and earnest study of Nature's laws and methods, much more intricate and obtruse problems than those which perplexed the King of Israel have been clearly comprehended. In that branch of science which relates to the living things of earth, and

¹ An address delivered at the Thirteenth Congress of the American Ornithologists' Union, at Washington, D. C., Nov. 12, 1895.

reflecting upon what has been accomplished in solving its mysteries, we look back upon the past, and behold; from out the mists of by-gone years shadowy forms arise refulgent with the glory of illustrious names, won by their possessors when in the flesh they struggled in this earthly literary arena, and who by the influence they exert in their works, remain with us still conquerors in the fight, though dead. How long that shadowy line has grown, and how far back into the silent past it reaches, and how rapidly, alas for the living, is that column augmented, of those scientific soldiers, who though they were members of different companies and regiments, yet each and all battled for the same cause, and died conscious of having fought a good fight, and upheld the scientific faith. In their written words they still speak to us, and point out the lines which their successors are to follow. While our thoughts are thus directed to this invisible army of once earnest earthly workers, we are reminded that we have assembled here to-day to pay our tribute of respect to one who but lately has gone to join that shadowy host, and who while with us was an honored member of this Union, a distinguished ornithologist, and to some of us a personal valued friend.

In the death of George Newbold Lawrence, though the great number of his accomplished years had diminished his scientific activity, ornithology has met with a serious loss. Born in the city of New York in 1806, his life was lengthened to almost thrice the period usually given to the generations of men, but the judgment passed by the Psalmist, on the years that exceeded those allotted to man, that they should bring nothing but "labor and sorrow," was never written for him, and the evening of his days was the most peaceful of his long life. Born in 1806, and gone from among us, as it seems but yesterday, think of the extent of time encompassed in the duration of this single life. Almost a century of active work, in the daily pursuit of an engrossing business, in the field studying the ways of our feathered creatures, in the closet laboring to solve perplexing problems that had to be met, in all that busy century of his existence there was little time yielded to idle recreation. During the period covered by this life was witnessed the rise,

progress, and attainment to its present important position in Natural Science, of American Ornithology. In 1806 there were no American ornithologists. He who was to shed so great a lustre upon the science by his immortal work, had as yet given no outward sign, and at this date Audubon, a young man, was unknown. Wilson was busy preparing his work upon our birds, which, however, did not make its appearance until two years after Mr. Lawrence's birth. As we come down the years hearken to the catalogue of names of celebrated men who have adorned the annals of ornithology in this land, finished their work, and passed over the river beyond the unknown farther shore. Beside the two already mentioned we recall Bonaparte, Jameson, Jardine, Ord, Say, Swainson, Richardson, Nuttall, Prince of Wied, Giraud, DeKay, Townsend, Cassin, Baird, Hermann, Suckley, Kennicott, beside many that are still active workers in the cause. But all of these who have been mentioned were the friends and acquaintances of Mr. Lawrence. They died not, most of them, in their early youth, cut off in the midst of their powers, with the hand still guiding the plough of investigation and research through an unfinished scientific furrow, but, on the contrary, many of them saw the accomplishment of their desires in their completed works and the attainment of advanced years. But time seemed to take no heed of our friend, touched not his powers, but left him unscathed, alert and active in the midst of his contemporaries falling about him on every side.

The Lawrence family from which the ornithologist descended was English, residing at Great St. Albans, Hertfordshire, and the first members to come to this country, where they arrived in 1635, were John and William, aged seventeen and twelve respectively, with their mother and sister. They settled first at Plymouth Colony, and then, in 1644, removed to Long Island where John became one of the Patentees of Hempstead. In the following year they moved to Flushing where the brothers, with others, obtained the patent of that place. John, in 1658, removed to New Amsterdam, and was one of the first aldermen of New York after its incorporation and change of name by the English, and its mayor in 1672. William, from whom Lawrence's branch descended,

continued to reside at Flushing, where he married Elizabeth Smith of Smithtown. After his death, his widow married Sir Philip Carteret, Governor of New Jersey, who named Elizabethtown after her.

From his earliest youth George Lawrence was a lover of birds, and passed much of his spare time studying their habits. But the early age when he entered actively in business (for he was only sixteen when he became a clerk, and twenty when he was made a partner in his father's house), did not permit him to have much leisure to devote to ornithology. In 1820, he was permitted to have a gun, seventy-five years ago! and then he began to pay attention to the movements of the feathered hosts, their arrival and departure in the spring and autumn. At this time he was living during the summer at his father's country place, called 'Forest Hill,' about eight miles from the City Hall, on the high ground overlooking Manhattanville and the Hudson River, not very far distant from where the American Museum of Natural History now stands. He has, in one of his papers, recorded his observations of bird migration at this spot, which in view of our knowledge of the locality as it is to-day, sounds very strangely to us. From the middle of July for some weeks there would be, every afternoon, a flight of Red-winged Blackbirds (*Agelaius phœniceus*), in flocks of fifty or more individuals, while in August and September there would be late in the day a continuous flight of White-bellied Swallows (*Tachycineta bicolor*), with a few Barn Swallows (*Chelidon erythrogaster*). At the beginning of September, when there was a strong northwest wind, Passenger Pigeons (*Ectopistes migratorius*) would appear in great numbers in the mornings, with occasional flocks throughout the day. From Forest Hill north was an unbroken forest to Fort Washington Point, and the Pigeons could be seen speeding over the tree tops at a rate of seventy-five miles or more an hour. Another of the old country seats at that time was Claremont, now for some years used as a restaurant and situated not far from General Grant's tomb, and during one of these flights of the Pigeons more than a hundred were shot one morning by a gentleman from the roof of the dwelling. He enumerates many other species of birds that passed Forest Hill during the various months of the summer, and also speaks of the Robins pursued by gunners in

the high woods where is now Third Avenue and 20th Street. At the time the Robins were migrating there would frequently be seen large flocks of Meadowlarks (*Sturnella magna*) going south, and they would congregate in great numbers in what were then pasture fields, about where Broadway and 40th Street now is. He tells of skating from where the Tombs now stand in Centre Street, down the Canal that ran through the middle of Canal Street, passing under the wooden bridge that spanned it at Broadway, onto the Lispenard's meadows which stretched away to the Hudson River. To those of us who are conversant with the localities in the metropolis just mentioned, it seems strange indeed to hear one who has but just left us speak of them as familiar ground to him, when they were yet covered in great part by the primeval woods. It brings to our minds more forcibly than almost anything else can what seventy-five years in the life of our country, and of one single witness means.

It was while the Lawrences were living at Forest Hill that J. J. Audubon purchased several acres and built his house in what is now known as Audubon Park. Lawrence became intimate with his sons, Victor and John, yet he saw but little of the naturalist himself, who was then failing in health.

While thus studying the feathered tribes in his youth and early manhood, his knowledge did not extend beyond that gained from observation of birds' habits, and such appreciation of the subject as the possession of a few specimens enabled him to acquire, but ornithology as a science was unknown to him. Thus time passed on, and Lawrence was recognized as the successful merchant with, perhaps to a few of his friends, a great fondness for birds, but there was no evidence that he was in later years to become one of the great triumvirate, of what has been termed the Bairdian Epoch of American Ornithology.

In the year 1841 occurred one of those apparently trifling incidents in one's life that often alter its entire current, and which in this instance served to change Lawrence's interest in birds (which up to this period had been merely regarded as a pastime) into a serious scientific study. He and J. P. Giraud, who were among the first to make collections of birds found in the United States, were invited by Mr. J. G. Bell to come to his

room to meet a young ornithologist who was to show some facts in the anatomy of birds, especially exhibiting the muscles that move the wings. He then and there made the acquaintance of Spencer F. Baird, than whom no naturalist that ever lived possessed to such a degree the power to imbue others with his own enthusiasm, and to attract them to become devotees of the study of Nature's Kingdom by the irresistible magnetism of his own personality. The acquaintance thus formed soon ripened into an intimacy that never ceased nor slackened, but strengthened with the rolling years, until, like so many of Lawrence's fellow-workers, his guide and friend passed away from earth.

This friendship with Baird brought forth almost immediate results, and in 1842, when he was thirty-six years of age, appeared Lawrence's first scientific paper, the pioneer of that long line of publications which was destined to extend throughout the next fifty years. It was devoted to a description of the Black Brant (*Bernicla nigricans*), and with a happier fate than falls to the efforts of many budding ornithologists thirsting for immortality, this new creation was pronounced very good. Once launched in scientific work, every moment that could be snatched from mercantile pursuits that claimed the major portion of the day was given to the investigation of birds, and his contributions to different periodicals devoted to natural science increased in frequency and importance. Nearly at the same time with the advent of Lawrence's first paper, appeared one from the pen of a new writer, who was also to be associated with Lawrence in some of his most important work, and who by his great attainments and profound widespread knowledge in ornithological lore was to exert a deep and powerful influence on the science, and cause the name of John Cassin to be known and held in high repute throughout the world. It is fitting that as this form in shadowy lines moves across the vista of passed scenes, I should pay a tribute to one who perhaps more than any other was my guide and instructor in natural science, and who in certain lines of scientific investigation stood without a peer amid those whose works have dignified and rendered illustrious American ornithology. Baird, Cassin, Lawrence,—these were the names that represented for many years our science in the New World, the triumvirate.

that dominated the period in which they unitedly labored. In 1869, in the midst of his powers, when it seemed there might be many years of profitable work yet in store, Cassin passed away, followed later by Baird, with labors more completely finished; and now it has fallen to my lot, who, when I first became acquainted with these celebrated men, was regarded by them but as an enthusiastic boy, to pay such tribute as I may to Lawrence who has laid down his pen after accomplishing the fullness of his years, his labors completely ended.

For the first ten years or so of his literary work, Lawrence was engaged in investigating the birds of the United States, and describing new forms, and his labors in the avifauna north of Mexico largely ceased with the completion of his portion of the ninth volume of the Pacific Railroad Reports, the fruit of the joint labors of Baird, Cassin, and Lawrence. This work created a revolution in the technicalities and methods of American ornithology, sweeping away all the old land-marks, and introducing a new era, a new system, and practically a new science. Lawrence's part in this great work was restricted to such of the water birds as were comprised in the Longipennes, Totipalmi, and Brachypteri. From this year, 1858, to the end of his scientific career, Lawrence devoted himself mainly to the birds of Central and South America, Cuba and the West India Islands, and he published continuously for nearly fifty years, his last paper appearing in 'The Auk,' in January, 1891. During his active scientific life he published in all one hundred and twenty-one papers, and described three hundred and twenty-three species as new, most of which have stood the test of subsequent investigation. In his work he showed much patient research, was slow to arrive at a conclusion, careful in all his comparisons, diligent in seeking his authorities, ever ready and willing to receive suggestions, and to acknowledge any error he might inadvertently have committed. Man is born to commit errors. I think naturalists are more convinced of that fact than any other class, but those who admit having done so are the exceptions, and therefore entitled to the more honor.

Lawrence's writings were mainly confined to the description of new forms, or lists of the birds in certain localities, and he never attempted monographic essays, or to embody his views and the

results of his investigations in a complete book form, but he was a faithful laborer in laying the foundation upon which others might raise a noble edifice. His knowledge of the birds of the New World was great and varied, and no one was ever more willing than he to place it all at the service of any seeking information. Systematic ornithology, and the great and absorbing questions of distribution, causes of migration, evolution, effects of environment on races and species, natural selection, and similar problems that have engaged the attention of many of his contemporaries in late years, were passed unheeded, and he was satisfied to restrict his work to the simpler branches of the science. But it is necessary in the construction of any great building that artificers of every rank and degree of skill should be available in order to produce the united, complete, and harmonious whole; and so it is fortunate for our science in the New World that it found so capable a master-workman, willing to devote his time and abilities to the formation and strengthening of the first stories of her stately edifice. The value of his labors was acknowledged throughout the world by ornithologists of every nation, and recognition was accorded him by a large number of learned and scientific societies. He was an Honorary Member of this Union, as well as one of its Founders and Member of its Council; also an Honorary Member of the Linnæan Society of New York, Foreign Member of the British Ornithologists' Union, Member of the New York Historical and Geographical Societies, Corresponding Member of the Zoölogical Society of London, of the Academy of Natural Sciences of Philadelphia, of the Natural History Society of Boston, and many others.

He was an active and important member of the New York Lyceum of Natural History, which he joined in 1845, famous throughout the world wherever zoölogical science is known, but now engulfed in the New York Academy of Sciences. It was through the exertions and faithfulness of Lawrence and a few other devoted men of his generation, that this old historic society was kept alive in the time of its greatest need, and I remember well the little band that used to meet once a week in the College of Physicians and Surgeons on 14th Street in the sixties, and, under the presidency of Major Delafield, read their papers and

discuss subjects of mutual interest. In this company Lawrence was always present, and he published all, or nearly all his writings in the 'Annals' of the Society, until it disappeared in the one with a more resounding name; but to the suppression of the title under which the old corporation had gained an enviable rank throughout the world, he was never reconciled. He, however, became a member, which indeed was his of right, then Fellow, and finally a Patron of the Lyceum's successor. He was one of the founders of the New York College of Pharmacy. In recognition of his labors, his brother ornithologists throughout the world conferred his name upon one genus and twenty species of birds, a more enduring monument than any raised from bronze or marble.

Lawrence's rank as an ornithologist will always be a prominent one, on account of the particular period of his activity, the men with whom he was associated, and the patient, faithful character of his scientific work, and his name will always adorn the annals of American ornithology.

But it is of the man himself, rather than the ornithologist, that I best like to think and speak. I cannot recollect the time when I did not know George N. Lawrence, and from the closest intimacy with his sons and various other members of his family, and the mutual interest in our sciences that naturally brought us together, I suppose it can be said that I knew him better than did any other naturalist, not even excepting Baird. Courteous, gentle, simple in his tastes and habits, almost child-like in his deference to the opinions of others in whom he reposed confidence, asserting his own opinions with a modesty that was remarkable, because so rare, Lawrence was a conspicuous example of that personage to whom we all turn with mingled feelings of admiration and respect — a gentlemen of the Old School, of the days of our ancestors, when knee breeches and brocaded silks were parts of the ordinary costume, and the manners of the age were characterized by dignity and a respectful demeanor. Although verging on to four score and ten years, Lawrence never grew old, and his interests in the sports of the fields and the occupations of youth were as lively and intense in his last year as in the days when he was wont to shoulder his gun and take an active share in them. The last time I saw him, but a short while before his death, he was

as eager for news of ornithology and ornithologists as he ever displayed in the days of his activity, and his mind was clear and showed no evidence of his great age. The end was peaceful, and he passed away only a few days after the death of his wife, to whom during the period of her long illness, he had ever exhibited a touching, affectionate devotion rarely witnessed.

With Lawrence ends an era of our science in the New World. In a certain sense he belonged to the past, to the ranks of those who directed ornithological science into a new path in the middle of this century before a large proportion of the present workers were born, and although he wrote and published as late as four years ago, his name is best associated with those long since passed from earth. What he did, he did well, to the best of his ability, and he has left an unblemished record and an untarnished name. Happy for that Science! Happy for that land! which can claim for its own men like this, pure in life and mind, devoted to the interests which command the highest thought of their being, and which bring good to the many. There is one more escutcheon on Fame's temple wall, one more name inscribed in line of golden light, and as we contemplate this life, and behold the "upright man and the just," and mark his peaceful passing from earth's familiar scenes, we seem to hear, as though from out a cloud illumined with celestial fire, a voice uttering the solemn admonition—

"So live, that when thy summons comes
[Thou too shall] approach thy grave
Like one that wraps the drapery of his couch
About him, and lies down to pleasant dreams."



ARDETTA NEOXENA CORY.

THE STANDING OF *ARDETTA NEOXENA*.

BY FRANK M. CHAPMAN.

Plate I.

CERTAIN facts in the history of this well-named Bittern have caused several writers, myself among the number, to speak of it as probably an aberrant form or color-phase of our widely distributed *Ardetta exilis*. In figuring this peculiar bird in 'The Auk' an attempt has therefore been made to bring together for direct comparison as many of the known specimens as were available, for the purpose of deciding if possible the bird's standing.

Described by Mr. Cory in 1886 from a specimen taken in the Okeechobee region of Florida, there have since been captured thirteen additional specimens. Of this number five are from the type locality in Florida, one is from Michigan, and seven are from Toronto.¹ Through the generosity of the owners of these rare birds I now have before me ten of the fourteen recorded specimens. This series presents much variation, to be spoken of more particularly after comparing the apparently normal plumage of the adult male and female and immature male with the corresponding plumages of *Ardetta exilis*.

Ardetta neoxena, ♂ ad.

Crown glossy black.
Back of the neck glossy black.
Interscapulars entirely glossy
black without buffy margins.

Tail glossy black.
Front of the neck chestnut.

Abdomen, sides, and tibiæ mixed
chestnut, black, and smoky brown.
Under tail-coverts glossy black.

Primaries slate gray *without* cin-
namon rufous tips.

Ardetta exilis, ♂ ad.

Crown glossy black.
Back of the neck chestnut rufous.
Interscapulars glossy black, outer
edge of outer ones margined with
buffy white.

Tail glossy black.
Front of the neck white more or
less washed with buffy.

Abdomen, sides, and tibiæ white
more or less washed with buffy.
Under tail-coverts white slightly
tinged with buffy.

Primaries slate gray, the outer
ones sometimes, the inner ones
always tipped with dull cinnamon
rufous.

¹ A fifteenth specimen, from Wisconsin, is recorded beyond in this number of 'The Auk.'

Outer secondaries slate gray without cinnamon rufous tips; inner secondaries black, glossy on the outer web and *without* chestnut rufous.

Lesser wing-coverts at bend of wing black.

Median wing-coverts chestnut.

Greater wing-coverts blackish slate gray, the inner ones with chestnut tips.

Under wing-coverts chestnut.

Outer secondaries slate gray tipped with cinnamon rufous; inner secondaries with outer web chestnut rufous, inner web blackish slate gray.

Lesser wing-coverts at bend of wing chestnut rufous.

Median wing-coverts cream buff.

Greater wing-coverts with basal half slate gray, terminal half chestnut rufous, the inner ones washed with cream-buff on the outer vane.

Under wing-coverts white, grayer at the base, and washed with buffy.

It will be seen from this comparison that there is no regularity in the substitution of colors; hence these birds differ not alone in color, but also in pattern of coloration. Thus, the chestnut of *neoxena* may replace either the white or buff of *exilis*, or the former may be black where the latter is chestnut rufous, buff, or white. The differences in distribution of color, or relative markings of the same parts, are most marked in the interscapulars, under tail-coverts, greater wing-coverts, and tips of the quills.

Ardetta neoxena, ♀ ad.

Similar to male but crown slightly, and back decidedly duller.

Ardetta exilis, ♀ ad.

Similar to male but black of head tinged with brown; back rich, dark brown; interscapulars more widely margined with buffy; under parts more heavily washed with buff, and with numerous blackish shaft-streaks, and in places slight blackish mottlings.

Measurements.

Six adults (5 males and 1 female, 4 from Florida and 2 from Toronto) average: wing, 4.59; tail, 1.56; tarsus, 1.56; culmen, 1.76.

Six adults (4 males and 2 females, 3 from Florida and 3 from Erie, Pa.) average: wing, 4.60; tail, 1.59; tarsus, 1.59; culmen, 1.81.

My notes on the female of *neoxena* are based on the original records and Mr. Hubert Brown's comparison of the two adult Toronto females, neither of which I have seen. One of these

has been compared by Mr. Brewster with a bird (No. 44,087) in his collection, and which he has loaned me. Mr. Brewster remarks: "The Toronto bird is a trifle the darker on the back and the chestnut of its under parts is slightly richer, but in other respects the two specimens are almost exactly alike." This No. 44,087 is not sexed, but with little doubt is an adult female. The outer margins of the interscapulars are decidedly brownish, but whether this marking appears in the two Toronto birds is not stated.

It appears, therefore, that there is less sexual difference in *neoexena* than in *exilis*. In size the two birds agree.

Ardetta neoexena, ♂ immature.

Similar to adult male but black of the head and back somewhat duller, the outer margins of the interscapulars slightly tinged with chestnut.

Ardetta exilis, ♂ immature.

Similar to adult male but crown duller, the feathers margined with chestnut rufous; back slate gray or blackish slate gray, the feathers tipped with chestnut rufous and ochraceous buff; under parts more heavily washed with buff, and with numerous blackish shaft-streaks.

Four of the ten specimens of *neoexena* now in my possession are birds of the year, three of them still showing remains of the nestling plumage. This is especially marked in a male from Toronto (Aug. 24, J. H. Ames) in which the nestling plumage still covers the abdominal region while the feathers of the head and back, although fully grown, still have the downy neossoptiles attached to their tips. These specimens are of the utmost importance for they evidently show that the immature plumage of *neoexena*, or the first plumage succeeding the nestling down, is practically like that of the adult, while *exilis*, on the contrary, at this age, differs markedly from the adult.

Here also should be mentioned the notes of Mr. J. F. Menge on the nest and young of *neoexena*, as quoted by Mr. W. E. D. Scott.¹ Mr. Menge, who collected four of the six Florida specimens, writes as follows: "I herewith send you notes concerning the Bittern as requested by Mr. J. W. Atkins, first found on 8th

¹ Auk, VIII, 1891, 309.

of June, 1890, two and a half miles above Fort Thompson, Florida, in a small willow swamp on the borders of Lake Flint [*lege* Flirt]. It was built of willow twigs and lined inside with maiden cane leaves. It was in a low bush two feet and a half above the surface of the water. There were four young birds, about two-thirds grown, in the nest. I had one of the old birds in my hand, which I think was the female. She was not inclined to fight and would not leave the nest. The other old bird was two or three feet from me and seemed a much larger bird. I did not disturb them and when I let the old bird go she hopped back on her nest as though she was accustomed to being handled."

This comparison shows such striking differences between these two birds, that to give further reasons for regarding them as specifically distinct seems much like proving an axiom.

Aside from the differences in color and pattern of coloration and the manner in which the mature plumage is acquired, the fact that the young of *neoxena* resemble the adults, and that no example of *exilis* showing an approach to *neoxena* has ever been recorded, would seem to give Cory's Bittern undisputed title to full specific rank.

While we may therefore reject the suggestion that *neoxena* is a color-phase of *exilis*, and in fact leave *exilis* entirely out of the question, the specimens of *neoxena* present certain characters which demand investigation. Allowing for normal variation only three of my ten specimens of *neoxena* are alike, while the remaining seven show either melanistic or albinistic markings or both combined. No. 167 (♂ im., Mich.) has several white feathers on the right tibia but is otherwise normal. The type (No. 2001, Fla.) has two entirely white feathers on the right flank. No. 44,087 (Fla.) has the abdominal region and flanks wholly chestnut without black. There are three pure white feathers on one side of the belly and five on the other; part of the anterior portion and the entire inside of the right tibia are white. No. 71 (♂ ad., Toronto) has conspicuous white patches on the abdomen, vent, and tibiæ. No. 44,088 (im., Fla.) presents the extreme of albinism; the abdominal region, breast, and tibiæ are almost wholly white, the outer primary of the left wing is entirely white, and white feathers appear on the bend of both wings and under wing-coverts. No.

29,289 has the abdominal region and breast black slightly tinged with chestnut and with one or two white feathers on either side of the belly. The left tibia (the skin on the right is wanting) is chestnut and black with white filoplumes. The chestnut on the median coverts is much reduced. No. 44,086 (♂, Fla.) is almost completely melanistic. The abdominal region is wholly black with the exception of two pure white feathers on either side of the belly. The tibiæ are smoky brown the inner side of the right one being white. The foreneck is black washed with dull chestnut, the wing-coverts are glossy black with no trace of chestnut.

This remarkable variability will be more fully appreciated by an examination of the following table:—

NO.	ABDOMINAL REGION.	TIBIÆ.	REMARKS.
167	Mixed chestnut and smoky brown.	Like abdomen but right with white feathers.	
2001	Mixed chestnut and black; two white feathers on right flank.	Like abdomen.	
44087	Chestnut with eight white feathers.	Chestnut, right partly white.	
71	Mixed chestnut, black and white.	Like abdomen.	
44088	White with a few chestnut and brownish feathers.	Front white, back smoky brown.	Outer primary of left wing and some feathers of bend of wing and under wing-coverts white.
29289	Black tinged with chestnut; three white feathers on belly.	Chestnut and black.	Wing coverts black tinged with chestnut.
44086	Black with two white feathers.	Right smoky brown, left smoky brown and white.	Foreneck black washed with chestnut. Wing-coverts glossy black.

While I do not pretend to explain this unusual degree of variation, I can see no reason for making it the basis of a theory that *neoxena* is a color-phase of *exilis*. Only three of the fourteen known specimens depart widely from what is evidently the type of coloration, and in every instance these differences are due to albinism or melanism, not one of the specimens showing any approach to *exilis*. Nor do the known cases of dichromatism among Herons give us any ground for asserting that *neoxena* is a dichromatic phase of *exilis*. Aside from the important differences exhibited by the young and female, a careful comparison of the adult males shows no substitution of colors such as we find in the phases of *Ardea rufescens*, *Megascops*, *Fulmarus*, or even *Stercorarius*. This is especially marked in the under parts, which in *exilis* are essentially all buffy, while *neoxena* has a chestnut forneck, a chestnut and black belly, and, in every instance, jet black under tail-coverts.

It is natural that the variability of *neoxena* should cause us to regard it with suspicion, but beyond the fact that the two birds are generically related and of the same size, there is not one grain of evidence implicating *exilis*. This latter bird is represented in our collections by hundreds of specimens not one of which has given reason for believing the species is dichromatic.

For the loan of specimens of this rare bird I desire to heartily thank Messrs. William Brewster, J. H. Ames, Charles B. Cory, J. H. Fleming, Jas. R. Thurston, and L. W. Watkins.

BIBLIOGRAPHY.

1886. CORY, CHARLES B. Description of a New North American Species of *Ardetta*. Auk, III, 262.
1886. CORY, CHARLES B. More news of *Ardetta neoxena*. Auk, III, 408.
Gives collector's name and approximate place of capture of the type specimen.
1886. COUES, ELLIOTT. Key to North American Birds. Third Edition. Appendix, 888.
Description of *Ardetta neoxena*.
1889. RIDGWAY, ROBERT. Manual of North American Birds, 127.
Description of *Botaurus neoxenus*.

1889. A. O. U. COMMITTEE ON NOMENCLATURE. First Supplement to Check-List of North American Birds, p. 6.

Ardetta is here ranked as a subgenus of *Botaurus* and the species is therefore recognized as *Botaurus neoxenus*.

1889. SCOTT, W. E. D. A second specimen of Cory's Bittern (*Botaurus neoxenus*). Auk, VI, 317.

Records the capture near Lake Okeechobee of the second known specimen.

1891. CORY, CHARLES B. Capture of a Fourth Specimen of *Ardetta neoxena*. Auk, VIII, 309.

Records an adult male from the Kissimmee River, Florida. The capture of the third known specimen herein referred to was not published until 1892.

1891. SCOTT, W. E. D. Notes on the Nest and Habits of Cory's Bittern (*Botaurus neoxenus*). Auk, VIII, 309.

Records the discovery, June 8, 1890, by J. F. Menge, of a nest containing four young on the borders of Lake Flirt, a small lake west of Okeechobee.

1892. SCOTT, W. E. D. A Description of the adult male of *Botaurus neoxenus* (Cory), with Additional Notes on the Species. Auk, IX, 141.

Records the capture of three birds by J. F. Menge near Lake Okeechobee. It is suggested that *neoxena* may prove to be a color-phase of *exilis*.

1892. SCOTT, W. E. D. Notes on the Birds of the Caloosahatchie Region of Florida. Auk, IX, 214.

"*Botaurus neoxenus*" is stated to occur regularly, though probably in small numbers, about Lake Flirt and in the great tracts of sawgrass that surround Lake Okeechobee.

1892. CROSS, W. A new Species for Ontario. Proc. Ornithological Sub-section Canadian Inst., for 1890-91, 41.

Records the capture, on May 18, 1890, of the first known Toronto specimen.

1893. A. O. U. COMMITTEE ON NOMENCLATURE. Fifth Supplement to the American Ornithologists' Union Check-List of North American Birds. Auk, X, 61.

Ardetta is restored to full generic rank, *Botaurus neoxenus* thus becoming *Ardetta neoxena*.

1893. BROWN, HUBERT H. Capture of another *Ardetta neoxena* at Toronto, Ontario. Auk, X, 363.

Records a female taken May 20, 1893.

1893. BREWSTER, WILLIAM. Capture of another *Ardetta neoxena* at Toronto. Auk, X, 364.

Comparing the specimen recorded by H. H. Brown with the four Florida specimens in his collection. It is stated to agree closely with No. 44,087.

1894. SHARPE, R. BOWDLER. [The Geographical Distribution of the Little Bitterns (*Ardetta*)]. Bull. Brit. Orn. Club, XXI, xxxi; reprinted in *The Ibis*, July, 1894, 425.
The writer states that "*Ardetta neoxena* of Cory seems to be founded on very old individuals of *A. exilis*, in which the rufous tips to the quills and the light stripes on the back have disappeared with age or wear"!
1894. AMES, J. II. Third Specimen of *Ardetta neoxena* taken at Toronto. *The Biological Review of Ontario*, I, 52.
Records the capture of a male on May 26, 1894.
1894. McILWRAITH, THOMAS. *The Birds of Ontario*, Second Edition, 109.
Botaurus neoxenus described with comment on the Toronto specimens.
1894. PICKERING, CHARLES. Fourth Specimen of *Ardetta neoxena* at Toronto. *The Biological Review of Ontario*, I, 54.
Records a specimen taken July 16, 1894.
1894. BRODIE, WILLIAM. Fourth Specimen of *Ardetta neoxena* at Toronto. *The Biological Review of Ontario*, I, 54.
Description of the specimen collected by Mr. Pickering with references to previously published records of this species.
1894. THURSTON, JAMES R. *Ardetta neoxena* at Toronto. *The Biological Review of Ontario*, I, 84.
Records an adult male taken August 16, 1894.
1894. FLEMING, JAMES H. *Ardetta neoxena* at Toronto. *The Biological Review of Ontario*, I, 85.
Records an immature bird taken August 17, 1894.
1894. AMES, J. II. *Ardetta neoxena* at Toronto. *The Biological Review of Ontario*, I, 86.
Records an immature male taken August 24, 1894.
1894. BROWN, HUBERT H. Notes on Cory's Bittern (*Ardetta neoxena*) and a comparison of the seven Toronto specimens. *The Biological Review of Ontario*, I, 86-91.
An important paper describing the locality in which all the Toronto specimens were taken, giving notes on their habits and food and comparisons of their plumage.
1895. WATKINS, L. WHITNEY. Cory's Least Bittern in Michigan. *Auk*, XII, 77.
Records a male from Jackson County, taken August 8, 1894.
1895. CHAPMAN, FRANK M. *Handbook of Birds of Eastern North America*, 131.
Ardetta neoxena described and the suggestion that it may prove to be a color-phase of *A. exilis* endorsed.

LIST OF RECORDED SPECIMENS OF *Ardetta neoxena*.

No.	Collection of.	Locality.	Sex and Age.	Date.	Collector.
2001	Field Columbian Mus.	Near Lake Okeechobee, Fla.	[♂ ad.]	[1835]	R. T. Stewart.
29289	William Brewster.	" " "	[♂ ad.]	July 9, 1889	J. F. Menge.
— ¹	?	Kissimmee River.	♂ ad.	May 19, 1890	R. C. Stewart.
— ¹	Canadian Institute.	Toronto, Ont.	—	May 18, 1890	W. Cross.
44086	William Brewster.	Near Lake Okeechobee, Fla.	♂ ad.	June 28, 1891	J. F. Menge.
44087	" "	Lake Flirt.	[♀ ad.]	July 15, 1891	J. F. Menge.
44088	" "	" "	Im.	Aug 15, 1891	J. F. Menge.
1326 ¹	J. H. Fleming.	Toronto, Ont.	♀ ad.	May 20, 1893	J. Ramsden.
—	J. H. Ames.	" "	♂ ad.	May 26, 1894	— Jacobs.
— ¹	Chas. Pickering.	" "	♀ ad.	July 16, 1894	Chas. Pickering.*
71	Jas. R. Thurston.	" "	♂ ad.	Aug. 16, 1894	— Hume.
1000	J. H. Fleming.	" "	♂ im.	Aug. 17, 1894	H. Day.
—	J. H. Ames.	" "	♂ im.	Aug. 24, 1894	P. Jacobs.
167	L. W. Watkins.	Watkin's Lake, Mich.	♂ im.	Aug. 8, 1894	L. W. Watkins.

¹ Not examined.

AN IMPORTANT FACTOR IN THE STUDY OF
WESTERN BIRD-LIFE.

BY CARL F. BAKER.

PROBABLY no better instance of the progressiveness of the American can be offered than that of the settlement of the arid lands of the Western States. Through the magic touch of irrigation a desert has been made to support a vegetation of almost tropical richness. Where once was but a barren plain, now spread broad fields of luxuriantly growing crops, fine orchards, and green meadows.

It would seem that in this wonderful transformation, brought about in so short a time, the zoölogist would find a field of surpassing interest for study, and one promising varied and valuable results. How it has affected the buffalo, antelope, elk, and badger are familiar facts. But its effects on the smaller mammals and birds have never been traced, although they must in many instances be nearly as marked as on those species mentioned. Compare for an instant the two sets of conditions. *Then*, a treeless, uninhabited tract (except along the streams which were few and far between) covered with a very scant herbaceous vegetation, upon which fell but very little rain. *Now*, covered with farms having ornamental trees and orchards in abundance, the face of the country not gray brown, but green, and water everywhere. These changes have been effected over immense tracts within a very few years, and are going on rapidly to-day.

It seems as if here was an opportunity such as occurs but once in an age. It is true that similar changes are in progress in all inhabited countries, but in no instance have changes on so grand a scale been brought about in so short a time. With a single exception, in none of the literature at my command can I find that such studies have been carefully prosecuted. This exception is an article by Dr. H. H. Behr (Proc. Calif. Acad. Sci., Vol. I), entitled 'Changes in Fauna and Flora of California.' Ornithological literature is full of specific instances of variation of habit produced by the settlement of the country, such as those of the Phoebe, Martin, Barn Swallow, and others. But I cannot find

that such a faunal study as I have mentioned, embracing any extended area, has ever been made.

In a recent article in 'The Auk' (Vol. XII, 'The Summer Range of Colorado Birds') Prof. Cooke ignores any such element as this in the study of Colorado birds, and for this reason he may describe anything but a natural state of affairs. For instance, the present status of the Western Meadowlark, Mourning Dove, Say's Phœbe, and Bullock's Oriole, in the Cache la Poudre Valley, must of a necessity be very different from what it was forty years ago, when nothing existed there to modify the natural distribution of the species. Thus it is entirely possible that Prof. Cooke's statement that "there is a greater variety of birds among the foothills, but not so many individuals as on the plains," may represent only an artificial condition. To describe the range of an animal like the buffalo, which occurred in immense numbers over a large part of the United States, as "very rare, occurring in small herds of some half a dozen individuals each, in remote fastnesses of the Rocky Mountains," would be but illy describing the life and distribution of the hordes of the plains.

At some few localities investigations have been carried on to determine the primitive and natural distribution of birds in our desert regions. But these regions are not now being irrigated and probably never will be. Studies should be prosecuted now in those regions liable to irrigation. It is from these as a basis that exact comparisons can be drawn in future years, and exact values given of effects produced by such tremendous surface changes as those occasioned by irrigation and the settlement of the arid region.

THE PINE GROSBEEK IN CAPTIVITY.

BY O. W. KNIGHT.

THE winter of 1892-93 will be long remembered by Maine ornithologists on account of the great number of Pine Grosbeaks (*Pinicola enucleator*) which visited this State. November 16, 1892,

I noticed two or three individuals feeding on seeds of the white ash near Orono, Maine. December 25 a flock of about two hundred individuals appeared in the yard of a friend in Bangor and began to feed upon the seeds of crab-apples of which a large quantity remained on the leafless trees in his yard. He at once sent word to me, and I was soon on the spot. I determined to catch a pair of the birds and see if they could be induced to breed in captivity.

A horse hair slip noose was speedily arranged at the end of a bean pole, and with this crude apparatus I essayed to capture the birds, which were very tame. They would sit quietly engaged in feeding, while I slipped the noose over one's head, and hauled it from its perch on the tree. The remainder of the flock did not seem to take any notice of the queer antics of their captured comrade, which uttered loud, harsh cries when handled while the noose was being removed from its neck. In this way about twenty females and young males were captured, but the handsome adult males were more wary and remained near the top of the tree, so that it was impossible to capture any of them.

After a careful scrutiny of the captives, I selected two likely looking ones which by sheer luck turned out to be a pair. My friend also selected a couple of the birds, and the remainder were set free. My pair of birds were placed in a large cage in our kitchen, where they would become accustomed to seeing persons near them, and they quickly became very tame. The next day after their capture, the male began to sing in a low ventriloquial voice which seemed to come from an entirely opposite direction from where he was.

In a few days they would eagerly take apple and hemp seed from my hand, and very soon I would allow them to come out of their cage and fly about the room. When I desired to get them into their cage again, a few seeds placed near the door at once enticed them within.

The male quickly assumed the ascendancy, and did not allow the female to partake of any proffered dainties until his own appetite was satisfied. The second week in May he showed indications of pairing, and nesting material was put in the cage. Both birds would carry this around the cage in their beaks, but did not seem to know how to begin to build a nest. May 30, the

male was found dead in the cage. Notwithstanding this, the female continued preparing to lay, and the morning of June 10 an egg was found in the bottom of the cage. June 11 a second and last egg of the set was laid. They were of a greenish blue color, spotted with black and lilac. The spots were thickest at the larger end where they tended to become confluent and form a wreath. The eggs measured $1.00 \times .68$ and $1.02 \times .64$ inches respectively.

The next winter, 1893-94, no Grosbeaks were observed in this vicinity, and so I was disappointed in getting a mate for my bird. The last of May, 1894, she showed signs of desiring to build a nest. An old nest of the Loggerhead Shrike was placed in a box in her cage, and she at once occupied herself in tearing it to pieces and attempting in a crude way to build a nest. On June 9, 14, 17, 22, and 23 she deposited eggs which exhibit the following dimensions: $.90 \times .69$, $.94 \times .70$, $.95 \times .68$, $.90 \times .65$, and $.90 \times .69$. On completion of this set she desired to incubate, acting very much like a sitting hen. In July she again began to prepare a nest, and on July 17 and 18 she laid eggs which measure $.81 \times .64$ and $.86 \times .62$ in.

January 17, 1895, a few Grosbeaks were observed feeding on some sumach berries in a small grove near Bangor. February 2 a flock of about twenty visited a crab-apple tree in a neighbor's garden, and, although they were very wild, I finally managed to capture one which proved to be a young male. He was at once introduced to the captive female, but the two developed a strong antipathy to each other, and a fierce fight ensued, so that I was obliged to place them in separate cages.

May 20 the female began to build a nest, and I again tried to mate the birds, but they at once began to attack each other, so I was obliged to give up all hopes of their mating.

On May 28, 29, and June 5, 6, and 7 eggs were deposited which measure $.92 \times .69$, $.83 \times .66$, $.93 \times .71$, $.88 \times .70$, and $.88 \times .69$ in., and the female at once desired to incubate. June 11 the bird began to construct another nest, and on June 14, 15, 22, and 24 she again laid. The eggs measure $.99 \times .70$, $.86 \times .67$, $.95 \times .70$, and $.64 \times .57$ in. The last egg laid was very small and contained no yolk. The bird now ceased laying until July, when on

July 10, 11, and 12 she laid eggs measuring $.93 \times .69$, $.94 \times .68$, and $.88 \times .69$ in. I now supposed that she was through with her remarkable production of eggs, but to my astonishment on July 25, 26, and 27 she again laid, the eggs measuring $.93 \times .67$, $.89 \times .64$ and $.90 \times .65$ respectively. This ended the production of eggs for this year. In August I tried to put the male in the cage with the female, and this time they managed to get along without quarreling, and have been kept in one cage ever since.

It was very interesting to observe the moulting of the male, and see him gradually take on the adult plumage. July 20 a few orange colored feathers could be observed on his head near the base of the bill; these gradually grew until on August 1, his drab colored head feathers were all replaced by orange colored ones. July 25 a few orange feathers were noted on his throat, and these grew and replaced the old ones until on September 5 the moult was completed. The feathers of the head, throat, etc., are of a peculiar orange color instead of the beautiful red hue which characterizes the wild birds of the same sex.

DESCRIPTIONS OF AN APPARENTLY NEW SPECIES
AND SUBSPECIES OF PTARMIGAN FROM
THE ALEUTIAN ISLANDS.

BY D. G. ELLIOT, F. R. S. E.

*Plate III.*¹

DURING a late visit to Washington my friend Mr. R. Ridgway kindly allowed me to examine the extensive series of Ptarmigan in the collection of the National Museum with permission to describe any novelties I might discover, and the two apparently new forms named in this paper are the results of my investigations.

¹ The publication of this plate is necessarily deferred till the July number.

Lagopus evermanni, sp. nov.

Habitat, Attu Island.

Adult male, Attu Island, 4th June, 1894.—Forehead white. Top of head and back of neck black, finely barred with tawny. Loral space, breast and entire upper parts, tertials, innermost secondaries, and upper tail-coverts black, with faint vermiculations of russet on rump, upper tail-coverts and edges of tertials. Sides of face black and white mixed. Comb over eye, scarlet. White feathers of the winter dress are interspersed among the feathers of the back and upper part of the breast. Most of wing-coverts, secondaries, and entire primaries pure white, with the shafts of primaries pale brown. Tail clove brown, almost black, with narrow white tips to the feathers. Entire under parts, including under tail-coverts, pure white. Bill and claws, black. Total length, 13.90 inches; wing, 7.50; tail, 5.30; tarsus, 1.30; exposed culmen, .50.

This specimen is not in complete summer dress, as is shown by the few remaining white feathers, scattered among the black ones, and also by the white forehead. These feathers would undoubtedly give place to others colored like those of the adjoining parts.

Adult female, Attu, 28th May, 1892.—Entire plumage of body ochraceous, palest on the throat, blotched and barred on the back with black and the feathers with white tips, while the feathers of rump and upper tail-coverts have ochraceous tips. On the breast and flanks the black blotches are much fewer but the black bars are broader, and there are no white tips on the breast feathers, but those on the abdomen and some on the flanks are broadly tipped with white. Under tail-coverts ochraceous barred with black. The tertials, inner secondaries and some of the greater wing-coverts ochraceous like the back, barred and tipped with white; remainder of wing and primaries pure white with the shafts of the latter pale brown. Bill and claws black. Total length, 12.80 inches; wing, 6.60; tail, 4.90; tarsus, 1.30; exposed culmen, .60.

Seven specimens, five males and two females, from Attu, one of the Near Island Group, brought by Prof. B. W. Evermann, Mr. C. H. Townsend, and Dr. S. I. Call, are all the representatives of this new species yet obtained. Of the Rock Ptarmigans of the Northwest, *L. evermanni* is apparently nearest allied to *L. rupestris nelsoni* of Unalaska and the Shumagin Islands, but is distinguished at once from all the Ptarmigans of the Western Hemisphere by its entire black and white plumage, exhibiting a strong contrast to *L. r. nelsoni* with its russet coloration. The female, while having a general resemblance to that of *L. r. nelsoni*, which is to be expected, as the females of most

Rock Ptarmigans are similar in appearance, presents differences in color and style of markings that cause it to be readily recognizable from all its relatives, the black predominating to such an extent in the hues of the plumage as to make her appear much darker than the female of any other species.

Attu Island is about 1400 miles west of Unalaska, and between these points only two forms of Ptarmigans have been procured,—*L. r. atkensis* and the subspecies *L. r. townsendi* described farther on, both very different in all respects from *L. evermanni*, and there are no opportunities for intergradation, the habitats of the different forms being islands and too far separated by extent of sea, while *L. atkensis* and *L. r. townsendi*, to be described later, preserve their peculiar general characteristics and individual distinctness throughout their range. The males of *L. evermanni* bear a certain resemblance to specimens of *L. mutus*, of the Eastern Hemisphere, where these have much black in their plumage; but between Attu and the continent of Asia is found *L. ridgwayi*, a very distinct form from Bering Island, about 300 miles west of Attu. This would seem to bar any possible relationship between *L. evermanni* and any continental species, though it is a surprising fact, and one that can only be theorized upon and not thoroughly explained, that species which are closely allied can be separated by many miles of sea and land, and yet retain their specific characteristics, though distinctly different species may be found occupying interlying territory. This is one of the curiosities of geographical distribution, the solution of which is probably beyond the power of man to fathom.

It gives me much pleasure to bestow upon this new species from Attu Prof. Evermann's name, as he was the first to bring this Ptarmigan to the notice of naturalists.

The other new form I propose to name

Lagopus rupestris townsendi, subsp. nov.

Habitat, Kyska and Adak Islands, Aleutian Chain.

Adult male, Kyska Island, 8th June, 1894, Nat. Mus. No. 135,634, type.—The general color of the entire upper parts, including head and neck, together with the breast and flanks, raw umber with a tinge of russet, finely vermiculated with black on lower back and rump, more coarsely marked

on the other parts, with black blotches on the head, neck, upper part of back and wings; feathers of back, rump and wings tipped with white. Some of these white tips are finely spotted with black, giving them a gray appearance. The outer secondaries, tertials, and most of the wing-coverts and primaries, pure white, the last having black shafts. The long upper tail-coverts are marked and colored like the back, with white tips. Tail clove brown, nearly black, the feathers tipped with white, broadest on the median, decreasing towards the outer ones, where it is either hardly perceptible or absent altogether. Throat white, mixed with a few colored feathers. Breast, sides of neck, and flanks ochraceous, barred with black, the bars broader and more conspicuous on neck. Abdomen and belly white. Under tail-coverts mummy brown barred with black. Loral space and ring around the eye black, and a scarlet comb above the eye. Sides of neck of a slightly paler hue than back or breast. Total length, 13.70 inches; wing, 7.50; tail, 4.00; tarsus, 1.50; exposed culmen, .50.

Adult female, Kyska, 8th June, 1894, Nat. Mus. No. 135,635, type.—Entire upper parts, including scapulars, tertials and upper tail-coverts ochraceous blotched and barred with black, most of the feathers tipped with white, except those on hind neck which are tipped with ochraceous. Tail square, clove brown, the four median feathers tipped with white. Secondaries, wing-coverts, and primaries white with black shafts, except those of inner secondaries which are white. Throat white. Breast, sides of body, and under tail-coverts ochraceous buff, lighter than the back, and broadly barred with black. Center of breast, abdomen, and belly pure white. Thighs and tarsus covered with white feathers. Bill and claws black. Total length, 12.50 inches; wing, 6.90; tail, 4.40; tarsus, 1.20; exposed culmen, .50.

Adult male, Adak Island, 4th July, 1893, Nat. Mus. No. 131,874.—Upper parts grayish wood-brown finely vermiculated with black, and having occasional black blotches, with generally subapical narrow black bars on the feathers, and white tips. The head and hind neck are more of a fulvous hue, and the black bars are very narrow. The breast is fulvous finely vermiculated with black, and with narrow black bars, the tips of the feathers being usually buff. The general appearance of the males in this month is more grayish with finer black lines and vermiculations.

Adult female, Adak, 4th July, 1893, Nat. Mus. No. 131,878.—There is not much difference upon the back of the female in this month, except there is apparently more ochraceous on the tips of the feathers in the median line and on the rump, with a tendency to grayish on the scapular region. The under parts differ in being uniformly rich buff with much narrower black bars than is seen in the June birds, and with the exception of an occasional white feather in the abdominal region, there is no white anywhere. This seems to be the full summer dress, and at once attracts the attention of the observer by the narrowness of the black lines and absence of white.

There are about twenty specimens of both sexes of this subspecies in the collection, taken in June on the island of Kyska and in July on Adak. The first of these lies in about 183° west Longitude and the latter in about 177° . There is a slight difference in the appearance of the birds from the two localities, and this can be attributed possibly somewhat to the difference of date in their capture, the Adak birds having been obtained one month later, but more to their geographical distribution, as Adak is several hundred miles east of Kyska, and the birds' environment has produced a different result upon them but one, not yet sufficiently pronounced to establish even a subspecific form. It will be observed that the male — and this example agrees with all the others taken at the same time — has much finer vermiculations, giving the back a slightly grayish hue, and the conspicuous black bars on the neck of the Kyska birds have been reduced to very narrow bars or vermiculations, and the general plumage presents a much more delicate pattern. The female shows even more striking changes. The back is decidedly grayish about the tips of the feathers, and the entire under parts are ochraceous buff, narrowly barred with black; the white on the breast, abdomen, and belly having entirely disappeared, only an occasional white feather showing here and there. The entire throat is a pure light buff. The specimen appears to have assumed a complete summer dress.

It is very evident that comparisons of Ptarmigans should be made between individuals not only from the same locality, but also taken in the same month, if possible the same day, for these perplexing birds being in a constant state of moult, a few days' difference in the time of their capture exhibits much change in their appearance, and one who has not studied them carefully with sufficient material, could easily be led to form an erroneous opinion regarding the status of a subspecific or even a specific form. As the birds from Atka and the two islands Kyska and Adak are spread before one, the differences between those of the first and the last two localities are so distinguishable and marked that the most careless observer would be able to detect them, and after a little investigation to separate them without hesitation even if they were mixed indiscriminately together, the Atka birds being

lighter in general hue and without the black blotches on the upper parts so conspicuous in the examples from the other islands. It is not, however, always easy to cause a description of allied forms among Ptarmigans to bring to one's mind any one of them with the clearness and unfailing accuracy that even one glance of the eye is capable of producing, and the doubter then, who has no access to the specimens, must form his opinion either mainly in the 'dark' or wait until access to sufficient specimens will enable him to comprehend thoroughly their differences.

I have conferred upon this subspecies the name of Mr. C. H. Townsend of the United States Fish Commission, who has brought many specimens of Ptarmigans from various islands in the Aleutian Chain.

SONGS OF THE WESTERN MEADOWLARK.¹

BY L. BELDING.

THESE songs of the Western Meadowlark (*Sturnella magna neglecta*) were copied at Gridley, California.

Numbers 1 and 2 are good examples of superior articulation. The pitch of No. 9 is uncertain, but that of the others is correct, or nearly so.

These twelve songs are selections from the best songsters. I have heard these songs many times, and have heard them sung imperfectly oftener than otherwise.


I have heard more *writeable* songs from this bird at this locality than at any or all places where I have been in this State, and I have always noticed the songs wherever I have been.

¹ For musical notations of songs of the Western Meadowlark as heard in Colorado, see Charles N. Allen, Bull. Nutt. Orn. Club, VI, 1881, pp. 145-150; as heard in Manitoba, see Ernest E. Thompson, Amer. Mag., April, 1887 (republished in Proc. U. S. Nat. Mus. XIII, 1891, pp. 575-579).—EDD.

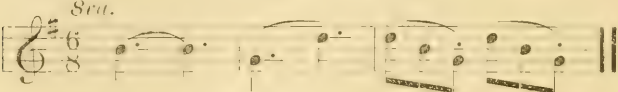
No. 1. *Sra.*



No. 2. *Sra.*



No. 3. *Sra.*



No. 4. *Sra.*



No. 5. *Sra.*



No. 6. *Sra.*



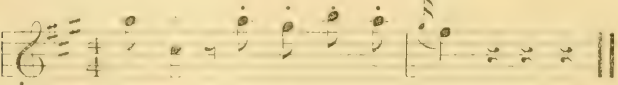
No. 7. *Sra.*



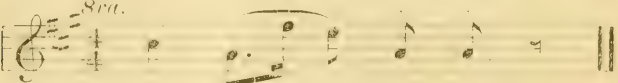
No. 8. *Sra.*



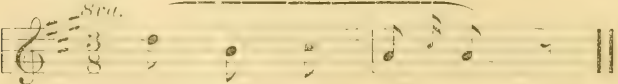
No. 9. *Sra.*



No. 10. *Sra.*



No. 11. *Sra.*



No. 12. *Sra.*



A NEW SUBSPECIES OF THE GENUS *DRYOBATES*.

BY A. W. ANTHONY.

SOME time since in looking over a series of western *Dryobates* of the *harrisi-hyloscopus* group, my attention was attracted by a number of specimens that seemed to belong to none of the recognized geographical races of *villosus*, and the difference was such as to warrant the supposition that a third western race eventually would have to be separated from *hyloscopus*, to which form it seems to have been very generally assigned. In order to ascertain how constant the supposed characters might be, and to improve our somewhat unsatisfactory knowledge of the western Woodpeckers of this group, a series has been brought together representing nearly all of the important parts of the habitat of *hyloscopus*. About one hundred specimens have been examined, over half of which are in my own collection. The mountains of Montana, Idaho, Wyoming, and Utah are represented by a series kindly loaned me by Dr. C. Hart Merriam. Unfortunately I have been unable to secure any specimens from Nevada, but other parts of the West and Southwest are represented in most cases by a good series. As long ago as 1888 Mr. William Brewster called attention to a difference in size between northern and southern specimens of *hyloscopus* (Auk, Vol. V, p. 252) and suggested that it might in time seem advisable to separate them. The types of *hyloscopus* were taken at San José, Cal., so it is from that part of the coast that we must look for specimens on which to base our investigations. I can see no constant difference in size between a series from this region and skins from Lower California (San Pedro Martir) or the northern part of the range of the subspecies. There is considerable individual variation both as to size and to purity of the white of the lower parts, and the series from the peninsula averages a little smaller than my skins from the central part of the State. There is one character, however, that seems to be rather constant in the series from Lower California that is not found in the northern skins to any extent. Ten of the twelve skins before me from San Pedro Martir have the lores black, the white superciliary stripe being separated from the smoky white nasal tufts by the

black of the crown. Two show whitish lores, a character belonging to *hyloscopus* and *harrisi*. Only one of my skins from central California shows blackish lores. I would not, however, attempt to separate the southern bird upon this rather unstable character.

The series from the Rocky Mountain region is quite easily separated from California specimens and constitutes a well-defined geographical race for which I can find no name available, and propose to separate from *hyloscopus*, to which race it has heretofore been assigned, to be known as

***Dryobates villosus montanus*, subsp. nov. ROCKY MOUNTAIN
WOODPECKER.**

Subsp. Char.—Differing from *hyloscopus* by larger size, much more purely white lower parts, and in having the lores chiefly or entirely black as in *villosus*.

Description of type, No. 3625, coll. A. W. A. Boulder County, Colorado, December 27, 1892.—Above black, dorsal stripe pure white, outer webs of primaries spotted with white as in *harrisi* and *hyloscopus*; occiput with red patch common to the group; lores chiefly black, with white superciliary stripe, separated from the basal tufts by the glossy black of the pileum; nasals white lined with black; below pure white. Wing, 135; tail, 105; tarsus, 18; bill from nostril, 30; depth of bill, 8 mm.

Habitat, Rocky Mountains from New Mexico to Montana, West to Utah (Utah Mountains).

From reference to the measurements it will be seen that the present race is fully the equal in size of *leucomelas*, and considerably larger than either *harrisi* or *hyloscopus*. It is distinguished from *leucomelas* at a glance by its usually unspotted wing-coverts and tertials. That it intergrades with *leucomelas* is shown by a specimen from Salmon River, Idaho, and one from Summit, Montana, both of which have the wing-coverts and tertials somewhat spotted and are intermediate between *montanus* and *leucomelas*. A specimen from Wind River Mts., Wyoming, Aug. 29, and one from Big Snowy Mts., Montana, Aug. 25, in the series from the Department of Agriculture, are directly referable to *leucomelas* and would indicate the race to be a resident in those localities. Only one of the skins from Colorado has the wing-coverts noticeably spotted and the measurements of this specimen place it with the eastern *villosus*.

MEASUREMENTS OF *Dryobates villosus harrisi*, *D. v. hyloscopus*, AND *D. v. montanus*.

	<i>Dryobates villosus harrisi.</i>				<i>Dryobates villosus hyloscopus.</i>				<i>Dryobates villosus montanus.</i>			
	6 males.				15 males.				10 males.			
	4 females.				10 females.				9 females.			
	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Maximum.	Average.	Minimum.
Wing.	128.16 ¹	133	125	125.5	127	122	121.	129	120	126	128.45	124
Tail.	94.85	104	83	95.25	102	91	92.75	98	87	98	96.45	91
Tarsus.	23.66	25	23	21.5	23	20	21.66	24	18	22	21.66	21
Bill from Nostril.	26.6	29	23	25.	25	25	24.03	29	23	23	24.10	23
Depth of Bill.	7.6	8	7	7.5	8	7	7.9	9	7	8	7.75	7

¹ All measurements in millimeters.

From the series of *hyloscopus* examined I would not consider that it is ever "pure white" below, though always much nearer white than *harrisi*. There is always a slight smoky brown or soiled appearance to the plumage of the breast and belly, quite noticeable in contrast with the Rocky Mountain race. I have never seen a specimen from California that I should call typical *harrisi*, though a few of the more northern skins are rather near that race, and a specimen from Lake County, California (Barrett Mt.) is much nearer *harrisi* than *hyloscopus*.

The habitats of the three western races might be mapped as follows:

Dryobates villosus harrisi.—From British Columbia south to northern California (Barrett Mt.).

D. villosus hyloscopus.—California south to San Pedro Martir Mts., Lower California, east to Chiricahua Mts., Arizona.

D. villosus montanus.—Northern New Mexico, north to Montana and Idaho. Utah (Uintah Mts.).

DESCRIPTION OF A NEW JAY FROM MEXICO.

BY GERRIT S. MILLER, JR.

AN undescribed Jay collected by Mr. W. B. Richardson in the mountains near Bolaños, Jalisco, Mexico, in February, 1889, differs in many ways from *Aphelocoma couchi* Baird, its nearest relative. It may be called

Aphelocoma gracilis, sp. nov.

Sp. Ch.—A little smaller than *Aphelocoma couchi* Baird and with disproportionately slender bill and weak feet; color throughout much grayer than in *A. couchi*.

Adult male (Type No. 5658, collection of Gerrit S. Miller, Jr., Sierra Bolaños, Jalisco, Mexico, February 26, 1889. W. B. Richardson collector): Back smoke gray faintly tinged with blue; rump, upper tail-coverts,

pileum, and sides of neck pale glaucous blue; cheeks and auriculars brownish slightly tinged with blue; wings blue of a shade somewhat darker than that of head, the flight feathers brownish on the inner webs and gray beneath; tail like wings, but the feathers showing faint transverse darker bars when held in certain lights, and blue extending over most of inner webs; whole ventral surface of body pale drab gray without trace of blue, darker across chest and on thighs, fading to dirty white on belly and crissum; feet and bill black, the latter marked with pale horn color at tip and along cutting edges from base to region about opposite nostrils.

None of the eleven specimens of *Aphelocoma couchi* that I have seen are near enough to *A. gracilis*, either in size or color, to cause any difficulty in distinguishing the two birds. The blue on the head, wings, tail, and upper tail-coverts is darker and much more intense in *A. couchi* than in *A. gracilis*, while in unworn specimens of the former the blue of the back is only just perceptibly dulled with gray. In the type, however, which was killed in April, the plumage is so much abraded that the color is much grayer than in fresh autumnal skins. The type of *A. gracilis*, taken in February, is apparently unworn, yet the back is noticeably grayer than in the type of *A. couchi*, and entirely different from fresh specimens of the latter. In *Aphelocoma couchi* the cheeks are either concolor with the pileum or so slightly tinged with brown as to make no strong contrast. In *A. gracilis*, on the other hand, the cheeks are noticeably browner than the pileum. The gray of the chest and thighs is in *A. couchi* always strongly tinged with blue (except in much worn specimens), while in *A. gracilis* it is entirely unmixed with this color. The bill of *A. couchi* varies considerably in shape, in immature birds appearing shorter and thicker than in the adults, but never approaches the weak slender bill of *A. gracilis*. In *A. couchi* the bill is entirely deep blue black except at the tip where it is pale horn color. In *A. gracilis*, on the other hand, the cutting edges from the base to near the middle are pale horn color like the tip. No trace of such marking can be seen in any of the specimens of *A. couchi*, although the series represents all ages from the adult to young not wholly moulted from the first plumage. The feet of the two birds differ greatly in size though not in the proportion of the various parts. The accompanying drawings show the

differences between the bills and feet of the two species. They were made by Mr. Frank Müller from the type of *A. gracilis* and an adult male *A. couchi*, the latter taken at Villar, San Luis Potosi.



Aphelocoma couchi is now known to range from Monterey, Nuevo Leon (the type locality), south to Zacatecas and central San Luis Potosi. Over this area the species is very constant in size and color. The more southerly specimens, however, are slightly larger than those taken farther north, while the largest in the series came from Jerez, Zacatecas. The fact that this specimen, taken at a point nearer the type locality of *Aphelocoma gracilis* than any of the others, differs most widely of all from the smaller bird is a strong argument in favor of the specific distinctness of the two forms.

My thanks are due to Mr. Robert Ridgway for the opportunity to examine the original specimens of *Aphelocoma couchi*; and to Dr. C. Hart Merriam for the use of the Jays in the collection of the United States Department of Agriculture.

MEASUREMENTS OF *Aphelocoma couchi* AND *A. gracilis*.*Aphelocoma couchi*.

No.	LOCALITY.	Sex.	Wing.	Tail.	Tarsus.	Middle Toe.	Claw of Middle Toe.	Culmen.	From Nostril.	Depth through Nostril.	Ratio of length from Nostril.
4113 ¹	Monterey, Nuevo Leon.	♂ ad.	144	135	39	25	10	29	21.4	10	46.7
4112	" "	♂ ad.	149	136	—	24	10.5	30	22	11	50
372	Villar, San Luis Potosi.	♂ ad.	155	146	41	24	10	30	22.5	10.8	48
373	" " "	♂ ad.	156	146	39	25	10	29	23	11	47.8
365	" " "	♂ ad.	156	145	41	22.5	9.2	29	21	10.4	49.5
358	Mts. near Jesus Maria, San Luis Potosi.	♀ ad.	154	146	42	25.5	9.5	30	23	11	47.8
5659	Jerez, Zacatecas.	♂ ad.	162	150	41	22	9	27	19	10.2	53.7
371	Villar, San Luis Potosi.	♂ juv.	148	141	39.5	23.5	9.5	27.5	21	10	47.6
366	" " "	♀ juv.	151	141	39	24.5	9.8	28	21	10.4	49.5
377	Mts. near Jesus Maria, San Luis Potosi.	♂ juv.	153	148	40	25.5	10.5	28	22	10.4	47.3
Average of 5 adult males.			153.2	142.6	40	24	9.9	29	21.6	10.6	49.24

Aphelocoma gracilis.

5658 ¹	Sierra Bolaños, Jalisco.	♂ ad.	146	138	33	21	8	27	20	8.8	44
-------------------	--------------------------	-------	-----	-----	----	----	---	----	----	-----	----

¹ Type.

NESTING HABITS OF *PHAINOPEPLA NITENS* IN CALIFORNIA.

BY FLORENCE A. MERRIAM.

AT Twin Oaks, San Diego County, California, in the spring of 1894, I had unusual opportunities for studying *Phainopeplas*. Five or six pairs nested in the valley and collected to eat the berries of the pepper trees in my front yard. I counted as many as four males and two females on the trees at one time.

In feeding, the birds occasionally flew against a bunch of berries, as Chickadees do, clinging while they ate; and I once saw one hover before a bunch while eating, as a Hummingbird whirrs under a flower. More frequently they lit on a branch from which they could lean over and pick off the fruit at leisure. I never actually saw them eat anything but peppers, but at one time when the brush was full of millers, the birds seemed to be catching them; and they sometimes made short sallies into the air as if for insects. They did this much as a Kingbird does, flying up obliquely and going down the opposite side of the angle.

Their flight was interesting. In leaving the pepper trees to go back to their nesting ground, they uniformly rose obliquely high into the air,—sometimes, I should judge, as high as one hundred feet,—and then flew on evenly, straight to their destination, several pairs going so far that they would disappear up a side cañon, or, as black specks, would be lost in the fog down the valley. When watching the flight of *Phainopeplas*, Mourning Doves often passed close beside me, and I was struck by the contrast in motion. The Dove cut the air, swerving to one side as it flashed by, and its free whirling flight served to emphasize the calm, even rowing of the *Phainopepla*. Occasionally the birds flew in an undecided way, still high and even, but changing their direction by sudden jerks. Frequently, when nearing the nest tree, a male would close his wings and shoot obliquely down, tilting his tail for a brake. One of them used to fly in at a height of about ten feet, waver as he came near, as if slowing up, and then after turning his head to look down and place the nest, tilt down in the usual labored way, his tail pressing the air. Not

until he was nearly through building did he discover that it was easier to slow up in time to fly down to the nest.

I once saw an odd flight. The bird flew out horizontally with its high crest erect; the effect was very droll. Indeed, the Phainopepla's expression changes as much with the position of the crest as the Waxwing's does. Ordinarily the high crown gives the bird a dignified, distinguished air, but when lowered in anger it adds a sudden menace as he darts at his enemy.

In watching the birds at their nests, I found that they had a number of calls. The commonest was uttered in the same tone by both male and female, and was like the call of a young Robin. In giving it, they flashed their tails, showing the square corners conspicuously. The male also had a harsh cry of warning, drawn out like *ca-rack* or *ca-ra-ack*. In addition, he had a scold and a note suggesting the Meadowlark. The Phainopepla's ordinary song had some weak squeaking notes, but it also had phrases of rich blackbird quality, recalling the *o-ka-lee* of the marshes. One of these was a high keyed *whee'-dle-ah*. Other parts could be roughly syllabified as *kit-er-ah-at* and *cher-nack'-ec*. The song in flight was bright and animated. I once heard a bird break out as he came down from a sally into the air, and he often flew away from the nest singing. Sometimes I thought he even sang in the nest. Of the other birds heard when listening to the Phainopepla, none were so common as the Wren-Tit (*Chamea fasciata henshawii*) and there could be no sharper contrast than that between the slow, distinct, descending scale of the Wren-Tit and the rapid runs and jumbled notes of the Phainopepla. Dr. Coues speaks of the evening song as a 'requiem,' and Professor Evermann dwells upon its plaintive quality. As I never watched the birds at dusk, I never heard this song, but the character of the day songs was markedly cheerful. Indeed, to me the Phainopepla's song was pleasing in spite of its jumbled notes, not merely because of the flute-like quality of some of its tones, but pre-eminently because of the bright, vivacious way in which it was uttered. However, with these general characters, even in the day time the song varied greatly, ranging from the soft lay which the bird warbled to himself as he sat in the sun to the rich and tender musical outburst with which he greeted his mate.

By following the birds as they flew from the pepper trees, I found four nests. They were all on the border or in the midst of dense chaparral. The valley had been almost cleared of brush and planted to grain, orchards and vineyards; but the desert-loving *Phainopepla* went back into the brush at the foot of the hills. One 'island' of brush was left in the middle of the rich valley, and this attracted them strongly. I found two of their nests there and suspected three. Of the four that I did find, all were built in low oaks, two not eight feet above the ground, and two under five. One was in a narrow socket between two small branches, and another was placed on a horizontal limb. All the nests were broken up, and the three that I took after they were deserted were made of about the same materials: small bits of plant stems, oak blossoms and other small flowers. The materials were so fine that, although I sat within a few yards of the nests when the birds were at work, I rarely saw them bring anything, except in the few instances when they came with grass dangling from their bills.

As soon as I began to watch the *Phainopepla*'s nests, I discovered that the males did almost all the building. This was especially surprising because in direct opposition to the laws of protective coloration, for their black plumage and white wing markings made them striking figures as they went about their work. On the other hand, the dull colors of the females toned in admirably with the gray brush in which the nests were situated. Moreover, their plumage was most inconspicuous with the sun on it, and in the low brush where the nests were, the sun beat down constantly.

I saw three pairs of birds building, and in each case the males were doing most of the work. Two of the nests I studied closely, watch and note-book in hand, in order to determine the exact proportion of work done by each bird. The appended tables show the results. One nest was watched two hours and a half, during a period of five days, in which time the male went to the nest 27 times; the female, only 3. The other nest was watched 7 hours and 35 minutes, during the period of ten days, in which time the male was at the nest 57 times; the female, only 8. Taking the total for the two nests: in 10 hours 5 minutes, the male went to

the nest 84 times; the female, 11. That is to say, the females made only 13 percent of the visits. In reality, although they went to the nest 11 times, the ratio of actual work might safely be much reduced, for in watching them I was convinced that as a rule they came to the nest not to build, but to inspect the building done by their mates: indeed, at one nest I saw nothing to make me suspect that the female did any of the work. Her coming was usually welcomed by a joyous song, but once the evidence seemed to prove that she was driven away; perhaps she was too free with her criticisms! In another case the work was sadly interrupted by the presence of the visitor, for while she sat in the nest her excited mate flew back and forth as if he had quite forgotten the business in hand. In several instances, while the males were at work building, or were guarding the nests, the females went off by themselves, and I saw two of them return home high in the air as if they had come from a distance. I suspected that they had been to lunch at the pepper trees, for they came from that direction. As they approached, their mates who had been sitting about indifferently before, suddenly became alarmed and warned them away from my neighborhood.

At other times when I rode in, the males would make large circles, seventy-five feet or more above me, as if to get a clear understanding of the impending danger. This was when small nest hunters were about, and the birds were some whose nests I could not find. Those whose nests I studied soon lost their fears, and were perfectly natural at their nests, even answering my calls and attempted imitations of their songs.

After finding that the males did most of the building, I was anxious to see how it would be when the brooding began. Three of my nests were broken up beforehand, however, and the fourth was despoiled after I had watched the birds on the nest one day. Nevertheless, the evidence of that day was most interesting, as far as it went (see Tables, Nest No. 2, June 25). It proved that while the female lacked the architect's instinct, she was not without the maternal instinct. There were two eggs in the nest, and in the one hour that I watched, each bird brooded the eggs six times. Before this, the female had been to the nest so much less than the male that she was much shyer; but now that the

eggs were there, although my horse frightened her by trampling down the brush near by, it was she who first overcame her fears and went to cover the eggs.

When building, the male was an enthusiastic worker. He would fly back and forth from the ground to the nest with his material so rapidly that it kept me busy recording his visits. As the tables show, he once went to the nest four times in four minutes (Nest No. 1, May 27); at another time, 17 times in one hour four minutes (Nest No. 2, June 9). Sometimes he stayed at the nest only half a minute, and when he stayed three minutes, it was so unusual that I recorded it. However, he worked spasmodically. On June 9, he came 17 times in one hour, but during the next half hour, he came only 5 times. The birds seemed to divide their mornings into quite regular periods. When I awoke at 5.30 I would hear them at the pepper trees breakfasting, and some of them were generally there as late as eight o'clock. From eight to ten they worked with a will, though the visits usually fell off after half past nine. When working in this more deliberate way, the male would go to his perch on an adjoining tree and sit and preen himself, catch flies, apparently, or sing between his visits. Once he sat on the limb in front of the nest for nearly ten minutes. By ten o'clock, I found that I might as well go to watch other birds, as little would be going on with the *Phainopeplas*. They often flew off to the pepper trees.

In building, the birds laid in the fine bits of weed gently, weaving in the longer stems a little and moulding more or less; but the compactness of the nest came rather from the mass of material than from any effort of workmanship.

It would be interesting to know how commonly the males do the building, and if the custom prevails, how it affects the broods that should keep up the *Phainopepla* population. None of the four nests I found came to anything. As there was a school-house near the nesting ground, the birds should have paid better heed to the laws of evolution. Supposing that the ancestors of these birds came from deserts unfrequented by small boys, it would be interesting to know if civilization will eventually modify the habits of the 'Twin Oaks' *Phainopeplas*.

RECORD OF VISITS OF MALE AND FEMALE *Phainopepla* TO NEST WHILE BUILDING. SPRING OF 1894.

Nest No. 1. DATE.	TIME AND SEX.												DAILY TOTALS.		
													Hrs.	Min.	♀
May 25															
26	♂ 9.07	♂ 9.09	♂ 9.11	♂ 9.16	♂ 9.30	♂ 9.36	♂ & ♀ 9.44	♂ 9.46	♂ 9.54					45	5
27	♂ 8.44	♂ & ♀ ¹ 8.47	♂ 8.47½	♂ 8.48	♂ 9.40									47	9
28	♂ 9.24	♂ 9.26												56	5
29	♂ 9.30	♂ 9.36	♂ 9.39	♂ 9.43	♂ 9.49	♂ 10.								2	2
														30	6
															—
Total for Nest No. 1.															
June 8	♂ 8.25	♂ 8.40	♂ 8.50	♂ & ♀ 9.07	♂ 9.08	♂ 9.10	♂ 9.11	♂ 9.14	♂ 9.35				1	10	9
9	♂ 8.15	♂ 8.16	♂ 8.17	♂ & ♀ 8.25	♂ 8.32	♂ 8.32½	♂ 8.33	♂ 8.39	♂ 8.45	♂ 8.49	♂ 8.50	♂ 8.53	♂ 9.04	9.06	
	♂ 9.15	♂ 9.19	♂ 9.27	♂ 9.37	♂ 9.55	♂ 9.59	♂ & ♀ 10.03							1	48
11	♂ & ♀ 9.05	♂ 9.06	♂ 9.10	♂ 9.12	♂ 9.14	♂ 9.16	♂ & ♀ 9.20	♂ ² 9.40	♂ 10.51	♂ 10.52	♀ 10.53	♂ 11.04	♂ 11.28	11.31	4
12	♂ 8.23	♂ 8.26	♂ 9.02	♂ 9.05	♀ 9.06	♂ 9.14	♂ 9.18	♂ 3.56						1	5
18	♂ 8.10	♂ 8.12	♂ 8.43	♂ 9.07	♂ 9.26									1	16
														5	
Total for Nest No. 2.															
Total for both Nests.															
													7	35	57
													10	5	11

¹ Female stayed on nest one minute and male came twice while she was there.² I was absent from 9.50 to 10 o'clock.

DESCRIPTIONS OF A NEW WARBLER AND A NEW SONG SPARROW.

BY WILLIAM BREWSTER.

ON examining the large series of Parula Warblers contained in the United States National Museum and in my own collection—in all upwards of two hundred specimens—I find that the birds which breed in the lowlands of our Southern States differ so appreciably from those which pass their summers at the North as to make it desirable to separate the two subspecifically. The southern form has first claim to the name *americana*, for Catesby's excellent plate and description of "*Parus fringillaris*" (Nat. Hist. Car., etc. I, 1731, p. 64), on which Linnæus based his *Parus americanus* (Sys. Nat., I, 1758, p. 190), were unmistakably taken from a southern bird. As no one of the other names which have been applied to the species at large seems to be clearly available for the northern form,¹ I propose to call the latter

Compsothlypis americana usneæ,² new subspecies. NORTH- ERN PARULA WARBLER.

Type, ♂ ad., No. 5392, Collection of W. Brewster, Lake Umbagog, Maine, May 14, 1881; W. Brewster.

¹ *Ficedula ludoviciana* Briss. (Orn. III, 1760, p. 500, pl. 26), *Motacilla ludoviciana* Gmel. (Sys. Nat. I, 1788, p. 983, based on Brisson) and *Motacilla equestris* Boddaert (Planches Enlum., 1783, pl. 731, fig. 1, 709 fig. 1) all relate exclusively to the southern bird. *Sylvia torquata* Vieill. (Ois. Am. Sept., II, 1807, p. 38, pl. 99) is in some doubt inasmuch as "New York" is mentioned in connection with its range, but the accompanying description, as far as it can be identified, applies to the southern form. *Sylvia pusilla* Wils. (Am. Orn. IV, 1811, p. 17, pl. 28) is preoccupied in Latham's 'Index Ornithologicus,' Supplement, II, 1801, p. 56, by *Sylvia pusilla* = *Acanthiza pusilla* Vigors, an Australian bird belonging to the family *Troglodytidae*.

² This bird usually, if not invariably, builds its nest in or of the *Usnea* 'moss,' while its southern representative, the true *C. americana*, is almost equally addicted to nesting in the Spanish moss (*Tillandsia*).

COMPARATIVE DIAGNOSES.

Compsothlypis americana.—Averaging slightly smaller but with a longer bill. Adult male with more yellow on the under parts and less black or blackish on the lores and malar region; the dark collar across the jugulum narrow, obscure, often nearly wanting; the chest pale, diffuse russet, without obvious markings.

Breeding Range.—The South Atlantic and Gulf States east of Texas, northward near the Atlantic Coast to the District of Columbia, and in the interior to Mt. Carmel, Illinois.

C. a. usneæ.—Averaging slightly larger but with a shorter bill. Adult male with less yellow on the under parts and more black or blackish on the lores and malar region; the dark collar across the jugulum black or blackish, broad and conspicuous; the chest mottled or spotted with rich brownish chestnut.

Breeding Range.—New England, New York, and westward along the northern tier of States, northward into the Maritime Provinces and Canada.

Although the characters just pointed out are all, apparently, of greater or less diagnostic value, no one of them, unfortunately, is quite constant. The most reliable distinction is that of the depth and definition of the reddish brown on the chest. With both forms the feathers of this part have brown centres and yellow margins, but in *americana* the brown is so pale and suffused with yellowish that the whole area over which it is distributed appears nearly uniform in tone, whereas in *usneæ* the brown is so rich and red (approaching chestnut in many birds) that it contrasts strongly with the yellow by which it is bordered, and gives the plumage the appearance of being rather distinctly mottled or spotted. This difference is almost as pronounced in young males in autumn as in old birds in breeding plumage. A still more striking character is to be found in the relative depth and extent of the dark collar on the jugulum, but while in fully seventy-five per cent of my specimens of *usneæ* this collar is much broader and blacker than in any of the examples of *americana*, a few spring males of the former have it but poorly defined or even practically wanting. Such birds are probably immature. With some of them the yellow of the under parts is quite as extended as in typical *americana*, but as a rule *usneæ* has much the less yellow of the two, especially on the throat. It is difficult to separate females of the two forms save by the difference in size, and in the shape and pro-

portions of the bill, but the female of *americana* is usually yellower beneath than that of *usneæ* and much more rarely shows any distinct traces of blackish on the jugulum.

It is probable that in the main the breeding range of *C. americana* is confined within the low parts of the South where the Spanish moss (*Tillandsia*) flourishes, and that *C. a. usneæ* is to be found in summer only where the 'Old Man's beard' (*Usnea*) grows, but the summer distribution of the northern bird is evidently not fully co-extensive with the distribution of its favorite 'moss,' and the southern form passes somewhat beyond the northern limits of the *Tillandsia* region, for it is represented in my series by several apparently typical examples from Washington, D. C., and Mt. Carmel, Illinois. Unfortunately I have seen no summer birds from the regions immediately to the northward of these points, where, it may be assumed, the two forms' approach each other more or less closely if they do not actually intermingle. That they sometimes intergrade is shown conclusively by five breeding males taken by Mr. Scott at Wytheville and Mountain Lake, Virginia, in June and July, 1889. In respect to color and markings these birds are about intermediate between *americana* and *usneæ*, but their bills are as large as in extreme specimens of the former. I have several other similar specimens collected during the migration in Florida.

Melospiza fasciata merrilli, new subspecies. MERRILL'S SONG SPARROW.

Subspecific characters.—Similar to *Melospiza fasciata guttata* but with the bill smaller, the ground color of the upper parts— including the sides of the head and neck— lighter and more ashy, the dark markings (especially those of the back) blacker and more sharply defined, the white of the under parts clearer and more extended.

Type, ♂ ad. (No. 46,026, Collection of W. Brewster, collector's No. 947) Fort Sherman, Idaho, March 6, 1895; Dr. J. C. Merrill, U. S. A.

Length, "6.10"; wing, 2.63; tail, 2.58; tarsus, .84; length of culmen from feathers, .44; depth of bill at nostrils, .25.

In respect to the size and shape of the bill, the length of the tail, the character and definition of the dark markings of the breast, sides and back, and the extent of the white on the under parts,

this form, of which Dr. Merrill has sent me nine specimens from Fort Sherman, is apparently intermediate between *M. f. montana* and *M. f. guttata*. It differs from both, however, in the ground color of its upper parts which are generally of a dark but clear ashy brown very unlike the faded grayish brown of *montana* and with but little of the rich, dull rusty which suffuses the plumage of *guttata*. Of the thirteen specimens of *merrilli* one taken in autumn affords the nearest approach to *guttata*. The spring birds (some of which were collected in April and May) are all essentially similar to the type of *merrilli*.

Dr. Merrill writes me that this Song Sparrow breeds at Fort Sherman where he took four nests and sets of eggs in 1895.

THE TERNS OF MUSKEGET ISLAND, MASSACHUSETTS. PART II.

BY GEORGE H. MACKAY.¹

REFERRING my readers to 'The Auk' for January, 1895, page 32, I now desire to put before them under the same title, some further data collected during the past summer. It had been my intention to visit Muskeget this year on the same dates as last, that comparisons might be better made of results. Had my purpose been carried out, which it was not, such would not have proved conclusive, for the reason that although the Terns arrived a week earlier than they did in 1894 and 1893, and ten days earlier than in 1892, they apparently did not commence to lay their eggs as early this season as last, for it was not until May 28, 1895, that the first two nests, each containing one egg, were discovered, notwithstanding Mr. Sandsbury had taken daily walks over Muskeget Island proper for this purpose, commencing on May 20. The first eggs noted in 1894 were found on May 21.

¹ Read before the Nuttall Ornithological Club, October 21, 1895.

It was on the evening of May 1, 1895, that the cries of the *first* arrivals of this season's Terns were heard; none were *seen*, however, until the next day, when half a dozen were observed high up in the air over Muskeget proper, the wind being east. On May 3 they were arriving in fair numbers, some three hundred (estimated) being seen; of these, some alighted on the shore of a cove on the northeast side of Muskeget Island proper. The weather was clear and calm, and there was a very heavy dew during the night. On May 6 the wind was northeast and the weather foggy; the Terns were now quite numerous. On May 7 it was calm in the morning, but breezed up in the afternoon with fog. The Terns were continually augmenting in numbers and were now abundant.

As previously stated, the first eggs this season were noted on May 28; on the 29th, 9 nests, each containing 1 egg, were discovered. On June 6 were observed 18 nests, each containing 1 egg; 72 nests each with 2 eggs; and 4 nests with 3 eggs each; but none with either 4 or 5 eggs. On June 8 was observed 16 nests with 1 egg each; 80 nests with 2 eggs each; 26 nests each with 3 eggs; and 2 nests each with 4 eggs; no nest of 5 eggs was seen. On June 9, Mr. Sandsbury walked in a direct line from his house to the north shore of Muskeget Island proper, returning by another line not covered by the first. He noted 263 eggs. On June 23 he repeated the walk, noting 457 eggs. On July 5 he again went over the same ground and noted 34 live, and 27 dead chicks.

I landed on Muskeget shortly before noon on July 7, and soon commenced observations. I have followed my previous plan of giving the results of this visit in the following condensed form:—

	<i>Nests.</i>	<i>Eggs.</i>	<i>Dead Chicks.</i>	<i>Live Chicks.</i>
July 8, '95. Muskeget Island proper.	716	1280	255	18 ¹
" 7, '95. South Point, Muskeget Island.	65	127	3	13
" 7, '95. South Point Island.	257	534	13	51
" 7, '95. Gravelly Island.	406	808	1	6
Totals,	1447	2749	272	88

¹ Mr. Sandsbury did not note the live chicks here.

Of the nests on *Muskeget Island proper* 244 contained each 1 egg; 395, each 2 eggs; 62, 3 eggs; 15, 4 eggs; no nest with 5 eggs was observed.

South Point of Muskeget Island.—This is a narrow strip of sand forming the extreme western extension of Muskeget proper. The beach-grass (*Ammophila arundinacea*) grows here luxuriantly, excepting near the shores, and towards the extreme end, which latter is bare of grass, with the exception of a few tufts. The Terns do not place their nests to any great extent among the tall grass, although some do where there are small *open* spaces. The majority of them apparently prefer the thinner grass and the windrows of eel grass (*Zostera marina*), as also the bare sand nearer the shores. We found here 19 nests, each containing 1 egg; 31, each 2 eggs; 14, 3 eggs; 1, 4 eggs; no nest with 5 eggs was observed. I noticed but few chicks or broken egg-shells here.

South Point Island.—This breeding ground is more elevated than any of the neighboring sands, and presents the best of conditions for the wants of these birds. The beach-grass grows scantily over its surface, and good sites for nests, with an outlook, are available everywhere. When I visited it on July 7 I found a great many of the eggs hatched. Its occupants are the same as last season, Roseates and Wilson's. This island being separated by only a narrow strait of water from South Point, Muskeget Island, the birds are practically the same at both places. Of the nests found, 30 contained each 1 egg; 179 each 2 eggs; 46 each 3 eggs; 2, 4 eggs; no nest with 5 eggs was discovered.

Gravelly Island.—Of all the breeding grounds in these waters, none attract and hold me pleasure bound equal to this little spot of about two acres, on which is concentrated the greatest amount of bird life, for its area, on the coast, its occupants being mostly the beautiful Roseate Tern (*Sterna dougalli*). Being situated at some little distance from the other islands, it is slightly more secluded and but little visited. Its central and highest part is covered with tall beach-grass. In the middle of the island is an unoccupied house, within fourteen inches of one of the corner posts of which, in a little hollow in the bare sand, there rested two eggs of a Roseate Tern; a little further away, say fifteen feet, was

still another nest and eggs. Disturbing the birds on our landing, we were immediately surrounded by a throng, all vigorously protesting against our entry. Mr. Sandsbury and I found here 68 nests which contained 1 egg each; 280 nests with 2 eggs each; 52 with 3 eggs each; and 6 with 4 each; no nest with 5 eggs was observed. It causes me some solicitude to think that if in any season the above house is occupied, not a bird will nest on this island, there being only sufficient room for one occupant. I am, however, of the belief that if such should be the case, the birds will locate on the other islands, if they can find undisturbed occupation.

On July 29, 1895, I again visited Muskeget Island and took a survey of all the breeding grounds. As will be perceived by the following result, incubation was drawing to a close, most of the young birds now being able to fly. At times when disturbed on Muskeget Island proper they would rise in such numbers as to remind me of a snow storm. The result of this, my second trip, is tabulated as follows:—

	Nests.	Eggs.	Dead Chicks.	Live Chicks.
July 30, '95. Muskeget Island proper.	166	260	45	12
" 30, '95. South Point, Muskeget Island.	33	53	3	45
" 30, '95. South Point Island.	75	120	26	63
" 29, '95. Gravelly Island.	61	93	14	26
Totals,	335	526	88	146

Of the above nests on *Muskeget Island proper*, 80 contained each 1 egg; 77, 2 eggs; 9, 3 eggs; no nest of 4 or 5 eggs was observed.

On *South Point, Muskeget Island*, 13 nests contained each 1 egg; 19, 2 eggs; 1, 3 eggs; no nest of 4 or 5 eggs was observed. On *South Point Island*, 33 nests contained each 1 egg; 39, 2 eggs; 2, 3 eggs; 1, 4 eggs; no nest with 5 eggs was observed. On *Gravelly Island*, 36 nests contained each 1 egg; 20 nests, 2 eggs; 3 nests, 3 eggs; and 2, 4 eggs. No nest of 5 eggs was observed anywhere during the entire season, nor was there anything unusual or peculiar in the appearance of any of the eggs

observed this summer, with the exception perhaps of two nests, each containing two eggs; in each case one egg was normal, while the other was of about half the usual size. On July 30, and again on August 16, about half a dozen chicks in the down, just out of the shell, were observed on South Point Island.

No correct conclusions can be based on the number of *live* chicks noted, on account of the impossibility of making even an approximate estimate of their real number. I take pleasure, however, in stating that never since I have known anything about them, have these Terns increased to such an extent as they did from last season to this. I regret my inability to give even estimates, *there being too many of them* for that. The present year has also been a most favorable one, as will be evidenced by the arrivals next spring.

In regard to certain "*dropped eggs*" described in my former article, I would say that during my first visit I found ten, eight of which I called Roseates, and two Wilson's; all were fresh. On my second visit I found thirty. One of these was dropped by a Wilson's Tern close beside me, being the direct result of the excitement caused by my presence. It struck a small stick and was broken. Mr. Sandsbury this summer also saw a Tern drop an egg in mid air.

It would seem as if the Terns in this locality were not adverse to drinking fresh water, for the two small ponds on Muskeget Island proper are *constantly* frequented by numbers, who take up the water invariably while on the wing.

From September 1 to 7 the Terns seemed to leave the middle of Muskeget Island proper, and roosted on the outside beaches at the west and south side of the island. From the 15th to the 22d they were observed to collect in large flocks, when they would mount in a spiral way, circling high up, and then descend again, indicating that they were getting themselves in training to start on their southern migration. The weather was fine, with southerly winds. On the 26th and 27th of September the wind was easterly with gentle breezes. Several very large flocks rose up in the air until lost to sight, being headed in a southwest direction when last seen. These Terns must migrate at an immense altitude, for they go up out of sight when they depart in

the autumn, and seem to drop from the clouds when they appear in the spring. By September 30 there were comparatively few Terns remaining, these^d being around the rips at the openings. On October 2 Mr. Sandsbury wrote me there were no Terns in sight from his house on Muskeget Island proper. I saw a few single Terns resting on the water, and flying about, as I passed through the Sound on October 3.

Since my former article I have made some further attempts to solve the problem of the cause of certain differences between what I have called the *reddish* legged and *flesh-colored* legged chicks of *Sterna hirundo* (see Auk, Vol. XII, p. 44). I found these chicks in evidence again this summer in about the same proportion as last season, say one-third red-legged birds and two-thirds with flesh-colored legs. As far as my observations go the differences between them appear to be fairly constant up to the period of their being able to fly, which is as far as I have been able to observe them. Hoping to obtain some further evidence, I kept a number of each kind in separate coops on Muskeget. None of them, however, lived over ten days, and most of them died inside of a week. They were fed on lobsters and clams. I then took a small series of selected chicks, had them sexed, made up into skins, and forwarded to Washington for Mr. Robert Ridgway's inspection, together with some other Terns' skins. He pronounced them *S. hirundo*, as did Mr. William Brewster later. This point being thus^d settled I would say that there are here apparently *two* kinds of chicks which differ in actions and in appearance. The red-legged are brighter, more active, and neater looking. Those with flesh-colored legs are lethargic and more stupid. Their bills are stouter and larger, and all in all they are a coarser looking bird, and I think a good many of them are hatched earlier than the red-legged birds. Under such conditions, is it not possible that there may be two varieties of *S. hirundo*, with differences which may be constant during youth, but which become undistinguishable in the adult birds?

The downy young of the Roseate (*S. dougalli*) may be distinguished by their upper parts being gray, white, and black, intermixed in longitudinal streaks; under parts whitish; bill pinkish flesh color, with black tip; legs and feet black. As they advance

in age, and by the time they are about to fly, the bill becomes wholly black, and the legs a more intense black. The general effect of the upper parts while in the down is a muddy brownish black; when older, the first color of the scapulars is black with light ash brown border, and when about to fly, a slight roseate hue is noticeable, in certain lights, on the breast.

It is interesting to see how defined and prominent certain characteristics of this beautiful bird are evinced in the chicks, in contrast with those of Wilson's Tern. The former has the 'blooded' strain, resenting in a vigorous, I might almost say fierce, manner, any unceremonious treatment, actively struggling and biting in order to effect release when captured. They are graceful and stylish looking even before they are able to fly much. Wilson's Tern, on the other hand, scarcely shows any of these marks of character (the nearest approach being developed in the red-legged chicks above described), being stupid and lethargic, and but slightly aggressive up to the age of flying.

Among the series of Terns taken this summer was one Arctic (*S. paradisæa*), a bird just commencing to fly, and which was sent to Washington with the others. It is now in Mr. William Brewster's collection. It may be described as follows: Entire under surface *white*, with the exception of a very faint *vinaceous* wash over lower sides of neck and a few *grayish* tipped downy feathers on tibiae and about anal region. General color of back and wings clear *gray* with upper outside edges and tips of primaries and outer tail feathers *slate gray*, the feathers of the back narrowly and faintly edged first with *clove brown* and outside of this with *pinkish buff*; inner edges of primaries and nearly the whole of secondaries as well as feathers of the tail pure white. Feathers of the forehead white; those of the crown mixed black and white, becoming entirely black upon the occiput and sides of head, including region about the eye. The black of the head is separated from the pure gray of the back and wings by a broad band of white faintly washed with gray. The whole bird is sparingly covered with long downy hair-like feathers protruding beyond the others, so light and fluffy as to wave about at the slightest breath. Tip of bill black; rest of bill and feet pale reddish.

I wish to say a few words before closing regarding the condition of the colony of Laughing Gulls (*Larus atricilla*), which are domiciled on Muskeget Island proper. A more highly gratifying state is difficult to imagine. The increase of last season is unmistakable. On June 9, 1895, Mr. Sandsbury found 10 nests, 4 of which contained 1 egg each; 5, 2 eggs each; and 1, 3 eggs. On June 18, he found 4 nests, each containing 1 egg; 3 nests with 2 eggs; 7 nests with 3 eggs each. On June 23 he again walked over the ground and noted 3 nests of 1 egg each; 3 nests of 2 eggs each; and 9 nests of 3 eggs each. No nests containing 4 or 5 eggs each have been observed during the entire season. On July 5 he again walked over the same ground, noting 4 nests of 1 egg each; 3 nests of 2 eggs; 2 nests of 3 eggs each. He also noted 18 young chicks in the down. The greater part of the nests above noted were marked with sticks during his walks, so that they might not be counted a second time.

On July 8 I went all over this breedingground, which is located this year where it was last season; its area has, however, increased very materially. It now embraced a strip nearly one quarter of a mile long and one hundred to one hundred and fifty yards wide, commencing at the North pond and extending in a westerly direction. I noticed a great many broken egg-shells, from which the chicks had been hatched, but I failed to find any of them in the grass. I judged these Gulls were feeling the utmost security, for their nests this season have all been placed in plain view on the top of a bunch of beach-grass stubs, of which materials the nests were constructed. I saw only one 'alley' nest this year. Besides a number of abandoned nests from which the eggs had been hatched, I noted 17 nests containing 37 eggs, most of which had, however, been previously noted by Mr. Sandsbury. Two of these nests contained each 1 egg; 6, 2 eggs each; 2 each 1 egg and 1 chick in the down; 7 nests contained 3 eggs each. As nearly as I could judge, all these eggs were near the point of hatching, a large portion of them being chipped.

On July 30, during my second trip to Muskeget, I again went carefully over all this breeding ground. Nearly all the eggs had been hatched, but I did not see a single *young* bird in the air. After considerable search Mr. Sandsbury and I found one nest

with 1 egg and 2 chicks in the down, and close by a fresh soft-shelled crab recently dropped by one of the parents; another nest contained 1 chipped egg, and a broken egg-shell; and still another 2 eggs. We discovered only 1 chick, which was about the size of a pigeon and looked very much like one, except for the length of its legs. This bird was mature enough to fly but made no attempt to do so, being very tame, eating from the hand the same afternoon. I have not seen a dead chick this season.

As a description of this large chick may prove of interest to some readers I give it, as follows: Feathers of the back slate gray edged at the tip with drab gray; top of head and sides mouse gray; exposed edges of wing-coverts and covered edges of feathers on back plumbeous; inner webs of the tail feathers and primaries black; throat light gray; breast and sides gray; bill, legs, and feet chocolate color.

It was apparent to me from the many abandoned nests and broken egg-shells—more than I have ever before seen—that this season has been a most favorable one for these Gulls. I noticed the old birds contentedly sitting about on all the bare spots of sand that were available on their breeding grounds, where they could watch and care for their young which were hidden in the beach-grass.

THIRTEENTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE THIRTEENTH CONGRESS of the American Ornithologists' Union convened in Washington, D. C., Monday evening, November 11, 1895. The business meeting was held at the residence of Dr. C. Hart Merriam. The public sessions, lasting three days, were held in the Lecture Hall of the U. S. National Museum, commencing Tuesday, November 12.

BUSINESS SESSION.—The meeting was called to order by the President, Dr. Elliott Coues. Eighteen Active Members were

present. The Secretary's report gave the membership of the Union at the opening of the present Congress as 667, constituted as follows: Active, 47; Honorary, 20; Corresponding, 68; Associate, 532; the total increase for the year being 51.

During the year the Union lost forty-six members,—eleven by death, fifteen by resignation, and twenty were dropped for non-payment of dues. The members lost by death were George Newbold Lawrence,¹ one of the Founders and an Honorary Member, who died in New York City, Jan. 17, 1895, in the eighty-ninth year of his age; Professor Thomas Henry Huxley, who died in London, England, June 29, 1895, aged 70, also an Honorary Member; Edward Hargitt,² a Corresponding Member, who died in Edinburgh, Scotland, March 19, 1895, in the sixtieth year of his age; and Henry T. Wharton, also a Corresponding Member, particulars of whose death have not yet been received. Also the following Associates: Dr. Frederick H. Hoadley,³ who died at Palm Beach, Florida, Feb. 26, 1895, aged 45; George H. Ragsdale,⁴ who died in Gainesville, Texas, March 25, 1895; Hon. Franklin Fairbanks,⁵ who died in St. Johnsbury, Vt., April 24, 1895, aged 67; Rev. A. H. Gesner,⁶ who died at Sing Sing, N. Y., April 30, 1895; John S. Cairns,⁷ who was accidentally killed June 10, 1895, while on a collecting trip to Black Mountain, N. C.; Dr. W. H. Stowe, who died in Palmer, Mass., March, 1895; James H. Slater, who died at Nashua, in February, 1895, aged 17.

The report of the Treasurer showed the finances of the Union to be in excellent condition, much better than ever before.

William Brewster was elected President; Dr. C. Hart Merriam and Robert Ridgway, Vice-Presidents; John H. Sage, Secretary; William Dutcher, Treasurer; Dr. J. A. Allen, Charles F. Batchel-

¹ For an obituary notice, see Auk, XII, pp. 198-199, also Memorial Address in the present number.

² For an obituary notice, see *Ibid.*, p. 315.

³ For an obituary notice, see *Ibid.*, p. 199.

⁴ For an obituary notice, see *Ibid.*, 316.

⁵ For an obituary notice, see *Ibid.*, pp. 315-316.

⁶ For an obituary notice, see *Ibid.*, p. 316.

⁷ For an obituary notice, see *Ibid.*, p. 315.

der, Major C. E. Bendire, Frank M. Chapman, Dr. Elliott Coues, D. G. Elliot, and Dr. A. K. Fisher, members of the Council. A. W. Anthony, of San Diego, Cal., was elected an Active Member; William T. Blanford, of London, England, an Honorary Member; Dr. D. Webster Prentiss, of Washington, D. C., and William Henry Hudson, of London, England, Corresponding Members. Eighty-eight new members were added to the list of Associates. The usual reports of Standing Committees were received.

PUBLIC SESSION. *First Day.*—The meeting was called to order by the President, Mr. William Brewster. After the routine business was disposed of Dr. Elliott Coues exhibited and explained a collection of unpublished water-color paintings of birds made by Louis Agassiz Fuertes. Remarks on the paintings were made by Mr. D. G. Elliot and the Chair.

The first paper of the morning was by Carl F. Baker entitled 'An Important Factor in the Study of Western Bird Life.' In the absence of the author it was read by Mr. Frank M. Chapman. Remarks followed by Dr. Merriam.

The second paper was 'On Pallas's Cormorant,' by Mr. F. A. Lucas. It was remarked upon by Dr. Coues, Mr. Chapman, and the author.

The third title was 'Further Remarks on the Subgenus *Quiscalus*,' by Frank M. Chapman. Discussion followed by Drs. Allen, Merriam, and Coues, Mr. Brewster, and the author.

The opening paper of the afternoon session was by Geo. H. Mackay 'On Gätke's Heligoland.' It was read by Mr. William Dutcher in the absence of the author. Remarks followed by Drs. Coues, Mearns, Merriam; Stejneger, Gill, Palmer, and Allen, Messrs. L. M. Loomis, Frank M. Chapman, F. A. Lucas, William Dutcher, and the Chair.

In the evening a special public Memorial Meeting was held in the Lecture Hall of the U. S. National Museum, in commemoration of the two distinguished Honorary Members of the Union who have died during the past year. The late George N. Lawrence was eulogized by Mr. D. G. Elliot, and Prof. Thos. H. Huxley by Dr. Elliott Coues.

Second Day.—The meeting was called to order by the President,

Mr. Brewster. A communication was received from Dr. Ch. Wardell Stiles, delegate from the United States to the International Zoölogical Congress, requesting the Union to appoint a representative to an Advisory Committee to which will be submitted all questions of nomenclature likely to be ruled on by the International Zoölogical Congress to be held in England in 1898. Dr. J. A. Allen was so appointed.

The reading of scientific papers began with one by Prof. F. E. L. Beal on the 'Food of the Meadowlark.'

The next paper was 'Methods in Economic Ornithology, with special reference to the Catbird,' by Sylvester D. Judd. Remarks followed by Prof. Beal, Messrs. F. A. Lucas, and J. Van Denburgh, Dr. Merriam, and the author.

The third title was 'Notes on the Birds of Idaho,' by Prof. M. J. Elrod. In the absence of the author it was read in part by Dr. Merriam, who remarked upon the paper. Further remarks followed by Mr. Rolla P. Currie.

'Pine Grosbeak (*Pinicola enucleator*) in Captivity,' by Ora W. Knight, was the fourth paper of the morning. It was read by Mr. F. A. Lucas in the absence of the author. Remarks followed by Drs. Merriam and Allen, Messrs. Loomis, Judd, and Lucas.

The first paper of the afternoon was by Mr. Leverett M. Loomis entitled 'Midwinter Migration Southward in the North Temperate Zone to Breeding Grounds.' It was discussed by Major C. E. Bendire, Mr. C. H. Townsend, Drs. Palmer, Mearns, and Merriam, and the author.

The concluding paper of the day was 'Why are there so few Bluebirds?' by Mrs. Louise M. Stephenson. As the author was not present it was read by Mr. Wm. Dutcher. Extended remarks followed by Dr. T. S. Palmer.

Third Day.—The meeting was called to order by the President, Mr. Brewster. Before proceeding to the reading of papers, the Committee on resolutions presented the following Report:—

Resolved: That the thanks of the 'American Ornithologists' Union be and hereby are tendered to the Board of Regents of the Smithsonian Institution for the use of the Lecture Hall of the U. S. National Museum as a place of meeting for the Thirteenth Congress of the Union, and for other courtesies extended.

"*Resolved*: 'That the thanks of the visiting members of the American Ornithologists' Union be and hereby are tendered to the Washington members for their cordial welcome and generous hospitality.'"

The first paper of the morning was by Mr. Frank M. Chapman, 'On the Standing of *Ardetta neoxena*.' Remarks followed by Drs. Allen and Merriam, Mr. Brewster, and the author.

The second paper was 'What Constitutes Publication,' by Dr. J. A. Allen. Remarks followed by Dr. Merriam.

The third title was 'The Value of the Tongue in the Classification of Birds,' by F. A. Lucas. Remarks followed by Dr. Allen.

The fourth paper was by Dr. T. S. Palmer, 'On Introduced Birds.' Remarks followed by Drs. Merriam and Gill, and the author.

The opening feature of the afternoon session was an exhibition by Mr. William Palmer of pictures, thrown on a screen, of living birds taken in their haunts, and of nests *in situ* from photographs made by Messrs. Wm. Brewster, F. M. Chapman, Harry W. Flint, and himself. Explanations were made by Messrs. Brewster, Chapman, and Palmer.

The first paper of the afternoon was entitled 'A Critique on Trinomial Inconsistencies,' by Wm. Palmer. Discussion followed by Drs. Allen and Merriam, Messrs. D. G. Elliot, F. M. Chapman, H. C. Oberholser, and the author.

Owing to the lack of time for their presentation in full the following papers were read by title:

'The Terns of Muskeget Island, Part II,' by Geo. H. Mackay.

'Kingbird and Sapsuckers in Southern California,' by A. J. Cook.

'A few Effects of the Winter of 1895 upon the Spring and Fall Migration in Canton, Mass.,' by J. H. Bowles.

The Union then adjourned to meet in Cambridge, Mass., Nov. 9, 1896.

This Congress was a most successful one — a thoroughly representative gathering of American ornithologists. It was especially gratifying to see so many Associate Members present.

JNO. H. SAGE,

Portland, Conn., Nov. 30, 1895.

Secretary.

RECENT LITERATURE.

Elliot's Monograph of the Pittidæ.—The fifth and concluding part of this beautiful monograph¹ is dated January, 1895, its publication thus covering a period of nearly two years. The present part contains nearly forty pages of introductory matter, and eleven plates, with their appropriate text. The species here figured are the following: *Pitta strepitans*, *P. mackloti*, *P. vigorsi*, *P. palliceps*, *P. nympha*, *P. cyanonota*, *P. oreas*, *P. forsteni*, *P. propinqua*, *P. soror*, and *P. inspeculata*. Several of these have not been previously figured.

The species recognized in the present monograph number 48—an increase of 18, or more than 50 per cent., over the number known in 1863, and included in the author's first monograph of the group. These 48 species are distributed in 3 genera (*Anthocinclæ*, *Pitta*, and *Encichla*) and 17 subgenera, of which 42 species and 15 of the subgenera are placed under *Pitta*. Mr. Elliot differs from most previous writers in adopting for some of the species names not generally current, their adoption being rendered necessary by due observance of the law of priority. No new species are described, nor are any new specific names given, but we note the introduction of the following new subgenera: (1) *Monilipitta*, type and only species, *Pitta arcuata*; (2) *Galeripitta*, type and only species, *P. cucullata*; (3) *Pulchripitta*, type and only species, *P. iris*; (4) *Ornatipitta*, including *Encichla guianæ*, *E. boschi*, and *E. schwaneri*; (5) *Insiginipitta*, including *E. ellioti* and *E. gurneyi*.

The Introduction gives (1) an elaborate 'Review of the Literature' of the subject (pp. v-xiii); (2) a history of the Genera (pp. xiii-xv); (3) 'Key to the Genera and Species' (pp. xv-xviii); (4) 'Classification' (pp. xviii-xx); (5) 'Geographical Distribution' (pp. xxi-xxvii). Mr. Elliot considers that the species of Pittas known to us to-day "are probably but the survivors of what was once a great and brilliantly plumaged group, inhabiting a vast extent of territory. The majority of the species," he believes, "have long since become extinct, and those remaining represent the few which have, through what may be termed fortuitous occurrences, been able to keep themselves above water, when the greater portion of their habitats disappeared beneath the waves." On no other supposition does he deem it possible to account for the isolated distribution of certain members of the group, as *Pitta angolensis* on the west coast of Africa, and

¹ A | Monograph of the Pittidæ, | or | Family of Ant-Thrushes. | By | Daniel Giraud Elliot, | . . . [12 lines of titles, etc.] | — | London: | Bernard Quarich, 15 Piccadilly, W. | 1893-1895. Folio, pp. i-xxvii + (letter-press, unpagged), col. pll. i-li. \

For notices of previous parts, see Auk, XI, pp. 62, 173, 243, and XII, p. 65.

P. nympha on the Japanese island Tsu-sima, in the Straits of Corea, as well as in Borneo; the species being for the most part natives of the Eastern Archipelago, but extending into India, Ceylon and China, the Philippine and Papuan Islands, to New Guinéa and northern Australia.

As the author states in his Preface, the present is an entirely new Monograph of the Pittidae, the text of the earlier Monograph having been discarded and that of the present written "as if the subject had only now for the first time engaged my [his] attention." A few of the plates of the first edition have been retained, but the majority are from new drawings by Mr. W. Hart of London, who has most skilfully executed his task. The Pittas constitute one of the most beautiful families of birds, their striking and yet pleasing display of colors rendering them a most attractive subject for the monographer. "It is not often," says our author, "that one returns to his first love and finds her, after many years, more beautiful than ever," as has been his experience in the present instance.—J. A. A.

The Fossil Birds of Patagonia.¹—It may be a little late to notice Dr. Ameghino's memoir, but as the work has not been reviewed in 'The Auk,' and as some of the birds described therein are truly extraordinary, it is perhaps a case of better late than never; moreover, there are one or two points concerning these birds and Dr. Lydekker's notice of them² that deserve at least a passing notice. In this memoir Dr. Ameghino describes the remains of thirty-two species of birds from the Eocene of Patagonia, fifteen of which, as well as nine genera and one family, are new. The main interest of the paper, however, centers about the gigantic forms for whose reception the order Stereornithes was established by Moreno and Mercerat in 1891. These authors have distributed in four families the various genera placed by Dr. Ameghino in the family Phororhacidae, although this grouping must be largely a matter of opinion, since the parts most necessary for a family diagnosis are lacking. Not all the species of the family are large, but the leading members of the group, *Phororhacos* and *Brontornis*, were birds of great size, rivalling in bulk the *Aepyornis* of Madagascar and the Moas of New Zealand, while they were, like them, flightless. The reduction of the wing had not, however, proceeded so far as in the last named birds. A remarkable feature of the genus *Phororhacos* is the great size of the skull, which in *P. inflatus* is 13 inches long and 5½ inches across the articular portion, while the mandible of *P. longissimus* is 21 inches in length and 8 inches across the condyles. Small wonder that the symphysis of such a jaw,

¹ Florentino Ameghino | Sur les | Oiseaux Fossiles | de Patagonie | Extrait du Boletín del Instituto Geográfico Argentino | tome XV, cahiers 11 et 12 | Buenos Ayres | 1895.

² Knowledge, London, June, 1895.

found in 1887, should have been ascribed to some sluggish edentate, so that the name as it now stands was originally intended for a mammal. This size is the more noteworthy when we consider that in most feathered giants, *Gastornis* is an exception, the skull is comparatively small, that of the Moas being so absurdly diminutive for the big body and massive legs as to seem like a caricature. A cervical vertebra of the larger species, *P. longissimus*, measures 5 inches across, and the tarsus of the smaller is nearly 18 inches long, indicating a bird not far from six feet high. *Brontornis* seems to have held much the same position among the Stereornithes that *Dinornis elephantopus* did among the Moas, being low and massive, as may be judged by the tarsus, which is $16\frac{1}{2}$ inches long and $5\frac{1}{2}$ wide at either end. *Pelocornis* was a smaller, more lightly built species than those just mentioned, but, taking the beak as a criterion, it is closely related to *Phororhacos*.

What may be the affinities of these big Stereornithes is a question of much interest, but it is one whose answer is still afar off, not only because such important parts as the sternum and palatal region are unknown, but because many intermediate links are needed to unite these extinct forms with any living birds. Dr. Ameghino lays great stress on the fact that there is no separation between the orbital and preorbital cavities, and that the lachrymal sends a thin process downwards and backwards from its inner edge to unite with the pterygoids (?). The first character is one of small importance since other birds, Gallinæ for example, have practically no bar of bone intervening between the orbit and the nasal, there being but one opening between it and squamosal. The other character seems important, but little can be said concerning it without having seen the skull itself, the more that one or two reference letters cannot be made out. One can but think that through some defect of the specimen the lachrymal and ethmoid have been misinterpreted, since it is ordinarily the lachrymal, and not the ethmoid, which is closely applied to the descending process of the nasal. Dr. Lydekker speaks of certain resemblances between the beaks of *Phororhacos* and those of the Cathartidæ, but the writer fails to see the least similarity between the two. Also, by a slip of the pen, the upward curve of the lower mandible is said to be found only in the Trumpeter, *Psophia*, among existing birds, whereas *Psophia* has no, or but the slightest, upturning of the mandible while numerous other birds have this feature. The abortion of the distal part of the pubis is unique, although there is a bare possibility that, as in some existing birds of prey, the posterior part of the pubis was present, but free, and attached to the ischium by ligament. Dr. Lydekker makes many comparisons with the Ratitæ, but, as Dr. Ameghino justly says, the Stereornithes appear to show that the division of the class of birds into Ratitæ and Carinatae is not fundamental, a point wherein most American ornithologists will agree with him. Apparently the main reasons for comparing such forms as *Phororhacos* and *Brontornis* with the Struthionines is because they are large and extinct when, as a matter of fact, mere

size is no reason for supposing a bird related to an Ostrich, while the pelvis of *Phororhacos*, with its aborted pubis, shows that this genus at least is very many removes from any struthious bird. Neither is *Gastornis*, with its primitive type of skull, any relation of the Stereornithes.

The well-developed supra-orbital bone of *Phororhacos* is particularly a mark of South American forms, but as it occurs in such different birds as *Psophia* and some of the Tinamous, it gives no clue to probable relationship, and until the sternum and palate come to light the Stereornithes must remain largely unclassified, although we have some hints as to their affinities and more as to their habits. The skull tells us that the Phororhacidae at least captured living creatures, for the upturned lower mandible occurs among the Herons, and is extremely well-marked in the Kingfishers. Correlated with the beak is the squareness of the hind cranium and the prominence of all the ridges, these things, which have to do with seizing and holding, being found in very dissimilar forms of similar predaceous habits. Birds of prey, which grasp with their talons, have the beak modified for tearing and possess a weak decurved lower jaw. The coracoid has little resemblance to the unique coracoid of *Psophia*, but the bones of the shoulder girdle, particularly the scapula, are very like those of a Heron, while the metacarpus much resembles that of *Palamedea*, minus the spurs. The pelvis, in its straightness and squareness, has certain agreements with that of *Palamedea* and the Herons, and still more with that of *Psophia*, though differing from them most emphatically in the abortion of the pubis. The main facts, however, shown by pelvis and legs, indicate that these birds were runners, though the hypotarsus indicates very plainly that there is no relationship with birds of high degree. That *Phororhacos* and its allies should have resemblances to more than one group of birds is not surprising, not only from their geographical distribution and geological horizon, but because although specialized in details they were generalized in many points of structure. The Phororhacidae at least seem distantly related to *Psophia* and not much more distantly to the Herons, and we may recall that we have one aberrant relative of the Herons alive to-day in the shape of the curious African *Balæniceps*. That the Stereornithes have any *near* living relatives is not evident and it is much easier to say where their affinities do not lie than where they do, but that such strange forms should have been found in South America seems quite natural, and others just as strange will undoubtedly come to light. We have in such birds as *Chauna*, *Steatornis*, *Psophia* and *Cariama* the waifs and strays of a lost avifauna left by the sea of time stranded on the shores of the present, and the more we delve in the sands of the past, the more of these quaint forms will we bring to light. And we cannot better close than by wishing it may be given to Senor Ameghino to find these missing pieces and fit them in their proper places.—F. A. L.

Elliot's Limicolæ.¹—A title of twenty-three lines may spare the reviewer some pains in describing a book, but there is much besides to be said of this noble work, in the preparation of which the artist and the publisher have ably aided the distinguished author. Mr. Elliot's splendid monographs of various other families have long since taken classic rank in technical ornithology, but we believe this is his first appearance in book form as a popularizer—an office of not less dignity than that of the systematist or monographer, one of practical importance and human interest, and one not so easy to fill creditably as those who have never tried to do so may imagine. The increase of knowledge is one thing, and its diffusion is another; but the latter is the real measure of the usefulness of the former. He who would make knowledge "understood of the people" has no easy task to perform; and if he attain a measure of success in this effort, he has stood the severest test to which his ability as an author can be subjected. It would therefore seem certain that in the present instance Mr. Elliot has won fresh laurels.

'Shore Birds' is a new departure for him, in which he addresses himself less to his experienced peers in the science than to sportsmen and others in the rank and file of those who love to study birds in their haunts—those for whom birds are among the brightest flashes of animated nature. For all such, the Plover-Snipe group has such special attractions that the author who chooses this theme is sure of his clientèle.

Mr. Elliot's method of treatment is an easy and natural one. After the introductory matter, which includes a glossary of technical terms, illustrated with an outline plate, and a send-off for Limicolæ in general, he takes each one of about seventy species or subspecies in its turn, giving as main text a concise life-history, under a popular name, and then in small type paragraphs presenting the most accredited scientific name—

¹ North American Shore Birds | a history of the | Snipes, Sandpipers, Plovers and their allies | inhabiting the beaches and marshes of the | Atlantic and Pacific coasts, the prairies, | and the shores of the inland lakes and | rivers of the North American continent; | their popular and scientific names, together with a full | description of their mode of life, nesting, migration and | dispersions, with descriptions of the summer and | winter plumages of adults and young, | so that each species may be readily identified. | A Reference Book for the Naturalist, Sportsman and Lover of Birds | by | Daniel Giraud Elliot, F. R. S. E., Etc. | Ex-president American Ornithologists' Union | Curator of Zoölogy in the Field Columbian Museum, Chicago; Author of "Birds of | North America," Illustrated Monographs of Ant Thrushes, Grouse, | Pheasants, Birds of Paradise, Hornbills, Cats, Etc. | With seventy-four plates | New York | Francis P. Harper | 1895 | One vol., pp. i-xvi, 17-268, pll. 1-74 (counting 2 cuts in text) + 1 pl., = 75 illust., 100 autograph copies with rubricated title, sm. 4to, regular ed. crown 8vo; published Sept. 26.

which members of the A. O. U. and other readers of 'The Auk' will be sure to recognize — a statement of habitat, and a technical description of the plumage for the sexes, ages, and seasons. There is much to recommend this simple treatment; for the sportsman who already knows his bird, or perhaps does not like technical caviar in his usual rations, can decline this dessert, and take his main course of biography in straight, easy reading. He will find these articles reasonably full, interesting as well as instructive, and may feel confident of their high degree of reliability; for Mr. Elliot has been out among the 'mud-dwellers' with his gun himself, and what he knows of their ways smells less of midnight oil than of gunpowder.

The author's admirable treatment of the Phalaropes raises a point on which we wish to remark. He adopts three genera — *Crymophilus*, *Phalaropus*, and *Steganopus*. Contrary to the opinion of some of his contemporaries, chiefly younger than himself, the present reviewer knows that recognition of genera in zoölogy is a purely arbitrary convention, mainly to facilitate list-making. We can take what grade of differentiation we please as our generic standard; but having adopted any one such, we are logically bound by it, and must not read off with a fine vernier-scale in some instances, and with a coarser gradation in some other cases. The differences between the three species of Phalaropes are coördinated; any one of them differs from the other two to the same degree that these do from each other. There is then one genus, or else there are three genera as Mr. Elliot rightly holds; there cannot be two genera. The hitch in this case seems to have been, that the A. O. U. committee permitted themselves to be influenced by a bit of faddism on the part of some person to whom birds' beaks looked big and their toes small — one who could see minute rostral modifications in a great white light, which so dazzled him that he was blinded to equal or even greater differentiations of digital structure. The same one-eyedness reduced the four-toed genus *Squatarola* to a subgenus of *Charadrius*, yet left the three-toed genus *Arenaria* (or *Calidris*) in full fig apart from *Tringa* (type *canutus*). Now if we remember anything about a group of birds which engaged our virgin pen about thirty-five years ago, there are no two genera of Sandpipers so nearly indistinguishable in form as those represented by *Arenaria calidris* and *Tringa canutus*, if we do not count their digits. Why then do we discriminate these generically, yet fail to separate *Squatarola helvetica* by the same token from the species of *Charadrius* proper? In point of fact, the evolutionary processes which result in the development of an articulated digit and its accessories, however small and practically functionless it may be, or those which end in the suppression of such a digit, are vastly greater in duration and in force than those which merely modify the size and shape of a bill to some appreciable extent; so that in ignoring the former to insist upon the latter, we have probably travestied an evolutionary record of geologic date.

But such points as these are niceties which need not have been made in

noticing a popular work, and would not have been raised in a review for any other periodical than our own and only 'Auk.' Consideration of technicalities takes us to Mr. Elliot's appendix, which gives keys to the families, genera, and species—short cuts to much learning, without which no bird-book now seems to be furnished with all appropriate belongings. These are excellent in the main, presenting the reader with successive alternatives, of which he has only to choose the one to which his specimen conforms to be led speedily and happily to its identification. The keyed appendix also gives formal generic diagnoses, references to authorities for the names used, and explication of etymologies. In this part of his work the distinguished author invites criticism which must be adverse in some few particulars, as in the statement that *Heteractitis* is a word "signifying an inhabitant of 'different shores.'" This word is a mere substitute for the prior but preoccupied *Heteroscelus* of Baird, and the difference implied in its construction is not one of 'shores,' but of certain shore-birds, to wit, those of the genus *Actitis*. It is also unfortunate that typographical errors, which crop up in the main text, cluster obtrusively in the appendix. We happen to know that this is not the author's fault, and can see how he wrestled with the printers—not in prayer, but with the reverse of devotional emotions, akin to those which marked the printers' own struggles with unwonted copy. But aside from this, the manufacture of the volume is perfect, reflecting great credit upon the enterprising publisher, who is rapidly making his reputation for fine book-work. The regular edition is handsome in all its appointments; the limited autograph edition is sumptuous.

Edwin Sheppard is a familiar name in connection with illustrated ornithological literature, and the author of 'Shore Birds' is fortunate in his artist. His fine work began early in the Bairdian period, and the present plates show that his hand has lost none of its cunning with rolling years. Mr. Sheppard's forte seems to be small, telling pictures which hit off likenesses of birds remarkably well for their size without the aid of other coloring than black upon white. They are very smooth and pleasing to the eye, and maintain their excellence evenly—none are bad, though some are more pleasing, and some more effective, than the rest. One of the most artistic pictures is that of the Stilt, whose colors suit the mode of printing well, and whose attitude is striking; the group of downy Kildeers is another which specially attracts the eye. Mr. Sheppard has a keen eye for points about a bird, and a sure touch is bringing them out; he understands structure, and consequently poses birds in natural attitudes. This is fortunate; for he had need of all his craft in attempting to delineate the difference between species of such genera, for example, as *Tringa* and *Totanus*, in which a trained ornithologist often has to look more than once to make a diagnosis. Our general criticism of Mr. Sheppard's work has for many years been, his tendency to needless accessories and too much background; but that may be our individual fancy for pictures of birds on plain white paper—not in quarter-sections of

country or even on sections of tree trunks as large as themselves; and in the present case of full-page plates, the technique we have is perhaps preferable.

We wish this book all the success it so thoroughly well merits; and should that be its happy lot, perhaps the eminent author will not forget that some other groups of game-birds might be treated in the same manner, with equally good results.—E. C.

Some Canadian Birds.¹—Mr. Chamberlain's very worthy aim is to produce a book on common birds at so low a price that it will be within the reach of every child who would know something of the feathered inhabitants of field and grove. He warns us not to expect too much, and when we glance at the price on the cover of his little volume, we readily admit that we have received more than our money's worth.

He gives pleasingly written biographies of some forty species. His style is attractive and seems well adapted to interest beginners. It is unfortunate, however, that he pays so little attention to the subject of identification, his descriptions being very brief and generally unaccompanied by measurements. It is to be hoped that in the second series of these bird studies, which we doubt not will duly appear, scientific names will be properly capitalized.—F. M. C.

Kirkwood on Maryland Birds.²—Faunal lists are of two kinds: they may sum up existing knowledge, however slight, of the life of a region as the basis for future work, or they may present the essentially complete results of long continued, careful observations. The present list belongs to the former class and should be considered as a preliminary report on Maryland birds, or, more strictly, the birds of eastern Maryland, for the author's information is largely drawn from what he terms the 'tide-water' region.

It is of course highly desirable that in a list of this kind attention should be drawn to the large number of birds whose presence in the State can scarcely be doubted, but which through insufficient observation have not actually been recorded within the State limits. To prevent their confusion with birds already known from the State, and to properly emphasize the

¹Some Canadian Birds. A Brief Account of Some of the Common Birds of Eastern Canada. By Montague Chamberlain. First Series. Birds of Field and Grove. Toronto: The Copp, Clark Company, Limited, 1895, 12mo. pp. x + 96, 15 cuts. 30 cents.

²A List of the Birds of Maryland giving Dates of the Arrival, Departure and Nesting Periods of our Regular Birds; also including Stragglers and such others as no doubt occur but are not recorded. By F. C. Kirkwood. Reprinted from the Transactions of the Maryland Academy of Sciences, pp. 241-382. Baltimore, 1895.

fact that they are to be especially sought for, these birds should be included in a separate list with an appropriate heading, as is customary in standard faunal papers. The author, however, commits the serious error of placing these birds in the body of his paper without even typographically distinguishing them from those that properly belong there. Examination shows that of the some 330 species given, about 42 are included as of probable occurrence. *Grus mexicana*, *Scolopax rusticola*, *Pavoncella pugnax*, and *Milvulus forficatus* have, it is true, been recorded from adjoining regions, where, however, they were too evidently accidental to deserve admission here.

The list itself adequately reflects our present limited knowledge of Maryland birds, the author having apparently made excellent use of the material at his command. It is attractively printed and we trust may prove an incentive to ornithological research in the region of which it treats.—F. M. C.

The Structure and Life of Birds.¹—This work takes a place on an almost vacant shelf in the ornithological bookcase. Its purpose is best stated by the author, who in his preface remarks: "The aim of this book is an ambitious one. It attempts to give good evidence of the development of birds from reptilian ancestors, to show what modifications in their anatomy have accompanied their advance to a more vigorous life, and, after explaining as far as possible, their physiology, to make clear the main principles of their noble accomplishment, flight, the visible proof and expression of their high vitality. After this it deals, principally, with the subjects of color and song, instinct and reason, migration, and the principles of classification, and lastly, gives some hints as to the best methods of studying birds." The specialist reading this syllabus will probably doubt the author's ability to adequately treat of so many and such varied themes within the limits of 400 pages, and while it is true, that some subjects suffer at the expense of others, the book contains a vast amount of exceedingly suggestive and valuable information. Furthermore, at the conclusion of each chapter, a list of works is given for the assistance of those who would pursue the subject more fully.

In the accepted meaning of the word we should imagine that the author of this well conceived book could not be called an ornithologist. Rather he seems to approach his task from the standpoint of the anatomist or physicist, and here he is apparently at home. His chapters on 'The Skeleton of Bird and Reptile' (pp. 6-28), the evolution of birds from reptiles (pp. 29-59), 'Form and Function' (pp. 60-172), and 'Flight' (pp. 173-274) are important contributions to structural and functional ornithology.

¹The Structure | and | Life of Birds | By | F. W. Headley, M. A., F. Z. S. | Assistant Master at Haileybury College | With seventy-eight Illustrations | London | Macmillan and Co. | and New York | 1895 | The Right of Translation and Reproduction is Reserved. | Sm. 8vo, pp. xx + 412.

When, however, he speaks from a more strictly ornithological point of view, or quotes the observation of others, he shows a lack of familiarity with these more distinctive phases of bird-life. This is particularly true of his remarks on 'Change of Colour without Moulting,' where he accepts as proven the theory that a practically white feather may become black by an influx of "pigment working its way to every part of the feather through channels as yet unknown"; for example, in the breast of the Dunlin, or head of the Little Gull or Black-headed Gull.

The one hundred pages devoted to 'Flight' should be read by all students of animal motion, while the philosophic ornithologist will find abundant food for thought in the chapters on color, reason, instinct, etc.

The chapter on migration will be read with special interest at this time when the publication of an English edition of Herr Gätke's book has awakened a fresh discussion of the many perplexing questions presented by this branch of ornithology. Mr. Headley here shows the lack of field experience more than in any other part of his generally excellent book. He thinks it unnecessary to "call in the assistance of the often-invoked glacial period" to account for the origin of migration and would seek a cause in the failure of the food supply both in the north and south, ignoring the fact that in the American tropics, at least, migrating birds begin their northward journey just as the rainy season sets in and the supply of both vegetable and insect food is greatly increased.

American students will read with some surprise of the orderly manner in which Old World birds are stated to migrate. In the fall the young birds are of course said to start first, a month or two later they are followed by the old birds, and after them come irregular flights consisting probably of cripples and young birds hatched late. "In the spring the order is reversed. First come the old cock birds . . . then old hen birds, then old hen birds and young birds mixed; then young birds alone; and, lastly, cripples in every stage of dilapidation."

These, however, are minor defects in a book which should have a marked influence in raising the character of ornithological research from the mere collector's level to the plane of scientific investigation.—F. M. C.

The A. O. U. Check-List of North American Birds, Second Edition.¹—The second edition of the American Ornithologists' Union Check-List of North American Birds is uniform in style and typography with the first edition, published in 1886, but omits the 'Code of Nomenclature,' which was issued separately in 1892. The present edition is a reprint of the first edition, with such changes in nomenclature as have been found nec-

¹ Check-List | of | North American Birds | prepared by a Committee | of
the | American Ornithologists' Union | Second and Revised Edition | — |
Zoölogical Nomenclature is a means, not an end, of Zoölogical Science | — |
New York | American Ornithologists' Union | 1895.—8vo, pp. xi + 372.
Published Dec. 9, 1895.

essary during the ten years intervening between the preparation of the two editions, and the proper interpolation of the additions in the seven Supplements published 1889-1895. Besides this the statements of 'habitat' or 'geographic distribution,' have been carefully revised, a large proportion of them having been rewritten, in consequence of recent increase in our knowledge of the subject. An effort has also been made, where practicable, to distinguish the breeding range from the general range. The Check-List is thus once more brought fairly abreast of the present knowledge of the subject.

The additions during the last ten years number about 36 species and 90 subspecies. Out of nearly one thousand specific and subspecific names in the first edition not more than 25 have been changed; 8 generic names have been changed, of which 3 were found to be preoccupied, the other generic changes being due to taxonomic revisions; a few groups ranked in the first edition as subgenera have also since been raised to full generic rank. Thus, all things considered, the nomenclature of the first A. O. U. Check-List has proved as stable as its best friends could have expected. That further additions will be made to the list, as time goes on, is evident, and probably a third edition may be found desirable by the end of the next decade.—J. A. A.

Hudson's British Birds.¹—It is not to be supposed that a new volume on British birds implies a corresponding increase in our knowledge concerning them. Consequently we look for this book's *raison d'être* in the method with which the subject is treated. In matters of detail, it resembles more or less closely other manuals of similar scope, but the author's facile pen and the artist's skilful brush seconded by a generous publisher, have resulted in the production of a work which is deserving a most cordial welcome.

Mr. Hudson is not bound by tradition. He insists that a book on British birds should be strictly such, and he rightly rebels against the custom of allotting as much space to a species which has occurred but once or twice, as to the commonest permanent residents. Of the 376 species enumerated by the B. O. U. list he considers that not more than 210 can rightly be called British birds. The 160 odd accidental or occasional visitants are therefore grouped at the end of their respective families with a brief statement of their true habitat and manner of occurrence in Great Britain. This very commendable proceeding serves a

¹ British Birds | By | W. H. Hudson, C. M. Z. S. | With a Chapter on Structure and Classification | By Frank E. Beddard, F. R. S. | With 8 Coloured Plates from Original Drawings by A. Thorburn | and 8 Plates and 100 Figures in black and white from Original Drawings by G. E. Lodge | and 3 Illustrations from Photographs from Nature by R. B. Lodge | London | Longmans, Green, and Co. | and New York | 1895 | All rights reserved | Sm. 8vo, pp. xxii + 363. \$3.50.

double purpose. It does not give these stragglers undue prominence and it permits a much fuller treatment of the native species. Probably no book on British birds which is at all comparable with this in size, contains such extended accounts of their life histories.

In writing these biographies Mr. Hudson aims to give us the characteristic habits of the species rather than a too finely spun sketch, which, however well it depicted his own experience, might be quite at variance with the results obtained by other observers. "Birds are not automata, but intelligent beings," and resemble each other in habits only up to a certain point. It is to this point that Mr. Hudson's biographies bring us. We wish, however, he had included a paragraph on distribution, a matter to which he gives little attention locally, while the fact that the birds he writes of are found outside of Great Britain is rarely stated.

The value of this book is greatly enhanced by its illustrations. These are not only of rare beauty but they are evidently drawn by artists who are familiar with their subjects in life. Furthermore, they possess the latterly unique merit of being drawn expressly for the work in which they appear.

Mr. Beddard's prefatory chapter of thirty-eight pages on 'Anatomy and Classification' treats briefly, but in a manner likely to interest beginners, of the more characteristic avian organs. He concludes with a classification of the orders of birds, in which, among living forms, he begins with the Ratitæ and ends with Psittaci! Not that he has "a deep-seated and mysterious reason" for placing the "Parrots at the end of the Aves Carnatæ," but simply through "sheer inability to place them anywhere in particular." This is evidently not an application of the decidedly original principle expressed on the preceding page, to the effect that, "the more perfect our scheme of classification, the greater our ignorance of the group classified."—F. M. C.

Bendire on the Cowbirds.¹—The parasitic habits of the Cowbirds render them a peculiarly interesting group, consisting of about twelve species, commonly referred to the two genera *Molothrus* (8 species) and *Callothrux* (4 species). They are of course all confined to the two American continents, ranging from southern Canada to Paraguay. The species of *Callothrux* are essentially tropical, ranging from Mexico through Central America to northern South America, one only, *C. robustus*, barely reaching southern Texas; while *Molothrus* is represented from the colder temperate parts of North America southward across the tropics to temperate South America. Very little is known of the habits of many of the species, only our own *Molothrus ater*, and the *M. bonariensis*, *M.*

¹The Cowbirds. By Major Charles Bendire, Honorary Curator of the Oölogical Collections, U. S. National Museum. Reprinted from the Report of the U. S. National Museum for 1893 (1895), pp. 587-624, pll. 1-3.

rufocollaris, and *M. badius* of southern South America, having been as yet carefully studied in the field. Major Bendire here presents us with an excellent summary of our present knowledge of the subject, consisting of his articles on the North American species, prepared for Part II of his 'Life Histories of North American Birds' (issued as 'advance sheets'), and Mr. W. H. Hudson's articles on the Cowbirds of the Argentine Republic, from Sclater and Hudson's 'Argentine Ornithology.' We thus have in the present paper very detailed accounts of the habits and distribution of five species and one subspecies out of the twelve recognized members of this parasitic group.—J. A. A.

Lucas on the Weapons and Wings of Birds.¹—As Mr. Lucas says, "a more accurate, if not a better, title for this article would perhaps be 'Some Weapons of Birds'"; and we venture to add that perhaps the title 'The Wings of Birds as Weapons' would be even more descriptive, since the paper relates almost wholly to the use of wings as weapons, and to the spurs and tuberosities with which they are armed. Some birds without spurred wings, as the Pigeons and Swans, are good boxers, but some of the Pigeons are not entirely unarmed, being provided with a horny boss or tubercle at the wrist, which adds effectiveness to their blows. The armature of the Spur-winged Geese, the Spur-winged Plovers, Jacanas, and Screamers is described and figured. Spur-winged birds, although apparently so well equipped for warfare, are, however, so far as known, among the most peaceable and inoffensive of birds; at least such seems to be the case with the formidably armed Screamers, and with the Jacanas and Plovers. Curiously in the latter, the size of the spurs on the wings is correlated with the development of the wattles at the base of the bill: species with large wattles having large spurs, and conversely.

Mr. Lucas has also something to say about the claws on birds' wings, and their significance as "reminiscences of well-clawed ancestors," citing in this connection the clawed fingers of the *Archæopteryx*. Mr. Lucas also devotes a page or two to the Hoactzin (*Opisthocomus cristatus*), figuring the young birds from spirit specimens in the U. S. National Museum, to show the use made of the wing-claws in climbing. In commenting on this antiquated type of bird life Mr. Lucas observes: "Not the least of the many interesting features of the Hoactzin is the rapid change which takes place in the fore limb during the growth of the bird by which the hand of the nestling with its well-developed, well-clawed fingers, becomes the clawless wing of the old bird with its abortive outer finger."—J. A. A.

¹ The Weapons and Wings of Birds. By Frederic A. Lucas, Curator of the Department of Comparative Anatomy, U. S. National Museum. Reprinted from the Report of the U. S. National Museum for 1893 (1895), pp. 653-663, pl. 1 and 8 cuts in text.

Fisher's Hawks and Owls from the Standpoint of the Farmer.¹—This is a condensed and very useful summary of the relations of Hawks and Owls to agriculture, based on Dr. Fisher's more elaborate 'Bulletin'² on the same subject. He considers first the 'Cause of the Prejudice against Birds of Prey,' and then refers to 'some characteristics of rapacious birds,' and to the 'food habits' of the principal North American species, and then proceeds to briefly treat of the species under the several categories of wholly "harmless species of Hawks and Owls," "wholly beneficial Hawks," "Hawks and Owls mostly beneficial," and "harmful Hawks and Owls." Among the latter are the Gyrfalcon, the Duck Hawk, the Goshawk, Cooper's Hawk, and the Sharp-shinned Hawk, the two latter, owing to the northern distribution of the others, being really the only species occurring in the United States in sufficient numbers to be of any particular importance as enemies of the farmer. These two species, with the Goshawk, Dr. Fisher believes, are the cause of the "unjust hatred and suspicion with which our Birds of Prey are held," in consequence of their often serious depredations upon poultry and game. The publication is timely and should do much to develop a more rational sentiment respecting the real character and the beneficial influence of most of these long-persecuted birds.—J. A. A.

Beddard's 'Text-book of Zoögeography.'³—In view of Mr. Beddard's excellent little work entitled 'Animal Colouration' (see Auk, X, 1893, pp. 195-198), and his many valuable contributions to technical zoölogy, the present work is not a little disappointing and will hardly add to the author's reputation as a careful and trustworthy investigator. The pages give evidence of either haste or carelessness, aside from the numerous typographical inaccuracies. Thus we are told, to cite a few examples, that *Gallinula chloropus* and *Totanus incanous* (p. 10) are among the comparatively few species "that have a world-wide range"; that the Curassows (p. 27) occur in California; among the genera enumerated as confined to the 'Palearctic Region' (p. 89) are *Perisoreus*, *Nucifraga*, *Cyanocitta*, and *Acanthis* (!); *Elasmognathus* (p. 109) is said to

¹ Hawks and Owls from the Standpoint of the Farmer. By A. K. Fisher, M. D., Assistant Ornithologist, U. S. Department of Agriculture. Reprinted from the Yearbook of the U. S. Department of Agriculture for 1894 (1895), pp. 215-232, pll. 1-3, and 3 fig. in text.

² See Auk, X, 1893, p. 199.

³ A Text-book of Zoögeography. By Frank E. Beddard, M. A. (Oxon.) F. R. S., Prosecutor of the Zoological Society of London, and Lecturer on Biology at Guy's Hospital. Cambridge: At the University Press. 1895. All Rights reserved. 8vo, pp. viii, 246. (Cambridge Natural Science Manuals' Biological Series.)

have been "separated by the late Mr. Alston" as a distinct genus of tapirs, whereas the separation was previously made by Dr. Gill, and rejected by Mr. Alston, who referred the Central American tapirs to the genus *Tapirus*; the genus *Rhea* (p. 111) is given as limited to the Chilian subregion, whereas it has a wide distribution in the Brazilian subregion as well; contrary to current views, the West Indian genus *Solenodon* is repeatedly referred to the family Centetidae. Besides numerous inaccuracies of this sort, more or less erroneous and positively misleading statements regarding the range of certain groups occur with surprising frequency, while typographical (?) errors (as *Cricetomys* for *Cricetus*, *Rhymphastidae* for *Rhamphastidae*, *Mimocychla* for *Mimocichla*, *Pilohela* for *Philohela*, etc.) betoken, to say the least, great carelessness. The latest authorities are also frequently overlooked, as, for example, nothing later than Salvin, 1875, is cited on the birds of the Galapagos, although the whole subject was treated by Ridgway on the basis of much new material in 1889. And so on, as regards questions of classification where accepted modern views are ignored.

As regards the general subject, Mr. Beddard's chief authorities are Wallace, Trouessart and Heilprin, the latter by no means a very trustworthy guide. No reference is made to any recent papers on the subject of the geographical distribution of animals in North America, not even to warn readers against the heresies they must contain, judged from Mr. Beddard's point of view.

The work is divided into five chapters as follows: (1) 'The General Facts of the Distribution of Animals'; (2) 'Zoölogical Geography'; (3) 'The Causes which influence the Distribution of Animals'; (4) 'The Fauna of Islands'; (5) 'Some Theoretical Considerations.' The 'general facts' given in the first chapter convey much general information, fairly well stated. The second chapter is devoted mainly to an exposition of 'Mr. Sclater's regions,' from the standpoint of Mr. Wallace. The slight importance of the actual facts of distribution, in Mr. Beddard's estimate, is sufficiently shown by the following extract from p. 78: "The question is, what system shall we adopt? The ideal system would be one which would agree entirely with the distribution of land and sea and their inhabitants; but that is unfortunately impracticable. The next best is obviously the plan to try; and Mr. Sclater's regions are, with an exception here and there, coincident with the continents and larger islands. The great thing is not to dispute the standard to be taken, but to agree in holding one standard." This illogical and unscientific platform is then followed by a recapitulation of Mr. Wallace's reasons for the retention of the Sclaterian regions, which are adopted in the pages which follow.

As necessarily follows in discussing "the causes which influence the distribution of animals," temperature is held as of slight importance, the first subheading being '*Distribution not dependent upon temperature*'! Yet he is compelled to admit: "That the range of animals is to a large degree dependent upon temperature is an undoubted fact; and to a certain

extent that fact does permit of the zonal arrangement of the earth." But he goes on to add, with strange disregard of facts, "only, however, as concerns the arctic regions" ! although he does later make the admission : "It is chiefly marine organisms which show a close interdependence of temperature and distribution."

Lack of space forbids a detailed analysis of the book, which, notwithstanding much that is unphilosophic and objectionable, and many loose statements, contains a great deal of information of value to the general reader, while not a few special points connected with distribution are discussed with ability and fairness. But on the whole the make-up and general character of the book is such as to suggest that it was prepared at the solicitation of a publisher in search of a work on this subject to fill a gap in a projected series of publications on natural history rather than from any innate fitness or desire on the part of the author to write on this particular topic. In other words, that it comes very close to the line of scientific hack-work.—J. A. A.

Townsend on the Birds of Cocos Island.¹—It was Mr. Townsend's good fortune to be one of the first ornithologists to visit Cocos Island. It is of volcanic origin, and although only four miles long by three wide is heavily forested and well adapted to support a resident land-bird fauna. Situated midway between the mainland at Costa Rica and the Galapagos, the affinities of Cocos birds are of unusual interest. If the islet is simply an isolated volcanic cone, in other words, a true oceanic island, it would be natural to suppose that its resident land-birds would be derived from the mainland. But if Cocos is a portion of the submerged land which, as Dr. Baur² claims, once connected the Galapagos with the continent, we might expect to find a Galapagan element in the Cocos avifauna. Of the four species of land-birds secured by Mr. Townsend, *Dendroica aureola*, is Galapagan, *Cocornis agassizi*, and *Nesotriccus ridgwayi*, described as the types of new genera, are the obvious representatives respectively of the Galapagan *Cactornis scandens* and *Eribates magnirostris*, while *Coccyzus ferrugineus*, previously described by Gould from Cocos, has no near relative, though the genus *Coccyzus* is represented in the Galapagos by the mainland *C. melanocoryphus*. The affinities of the Cocos avifauna are therefore clearly Galapagan and give support to Dr. Baur's theory.

The previously little known *Creagrus furcatus* was found in marshes at Malpelo, and five species of Petrels are given from the vicinity of the Galapagos.—F. M. C.

¹ Birds from Cocos and Malpelo Islands, with Notes on Petrels obtained at Sea. By C. H. Townsend. Bull. Mus. Comp. Zool., Vol. XXVII, No. 3, July, 1895, pp. 121-126. Two colored plates.

² American Naturalist, 1891, pp. 217-229, 307-326.

Publications Received.—Arrigoni Degli Oddi, E., and Paul Leverkühn. *Die ornithologische Litteratur Italiens während der Jahre 1891 bis 1893.* (Journ. f. Orn., 1894, pp. 280-290.)

Bendire, Charles. *The Cowbirds.* (Rep. U. S. Nat. Mus. for 1893, pp. 587-624, pll. 1-3.)

Chamberlain, Montague. *Some Canadian Birds.* 12mo., pp. x, 96, Toronto, 1895.

Clarke, Wm. Eagle. *On Some Birds from the Island of Negros, Philippines.* (Ibis, Oct., 1895.)

Elliot, D. G. *North American Shore Birds, a history of the Snipes, Sandpipers, Plovers, and their Allies.* 8vo., pp. 268, pll. 74. Francis P. Harper, New York, 1895.

Headley, F. W. *The Structure and Life of Birds.* 8vo., pp. xx, 412, with 78 ills. Macmillan and Co., London and New York, 1895.

Hudson, W. H. *British Birds.* 8vo., pp. xxii, 363, with 16 pll. and numerous text figures. Longmans, Green and Co., London and New York, 1895.

Kirkwood, F. C. *A List of the Birds of Maryland.* (Trans. Maryland Acad. Sci., 1895, pp. 241-382.)

Leverkühn, Paul. (1) *Todesanzeigen V-IX.* (Orn. Monatsschrift, XIX, Nos. 3, 7, 12, XX, 6, 9.) (2) *Vogelschutz in England.* (*Ibid.*, XIX, Nos. 1-11.)

Rhoads, Samuel N. *Contributions to the Zoölogy of Tennessee, No. 2, Birds.* (Proc. Acad. Nat. Sci. Phila., 1895, pp. 463-501.)

Rotzell, W. E. *Birds of Narberth, Pa., and Vicinity.* 8vo, pp. 8. 1895.

Schalow, Herman. *Ueber eine Vogelsammlung aus Westgrönland.* (Journ. f. Orn., 1895, pp. 457-481.)

Slater, P. L. *Chairman's Address on opening the Fourth Session of the British Ornithologists' Club, 1895.* 8vo., pp. 4.

Stone, Witmer. *List of Birds collected in North Greenland by the Peary Expedition of 1891-2, and the Relief Expedition of 1892.* (Proc. Acad. Nat. Sci. Phila., 1895, pp. 502-505.)

American Journ. Sci., Oct.-Dec., 1895.

American Naturalist, Oct.-Dec., 1895.

Anales del Museo Nacional de Montevideo, III, 1895.

Annals of Scottish Nat. Hist., No. 16, Oct., 1895.

Bulletin British Ornithologists' Club, Nos. 29, 30, 1895.

Forest and Stream, XLV, Nos. 14-26, Oct. 5-Dec. 28, 1895.

Journal of the Cincinnati Soc. Nat. Hist., XVIII, Nos. 1, 2, April-July, 1895.

Medical Age, The, XIII, Nos. 19-23, 1895.

Naturalist, The, Month. Journ. Nat. Hist. for North of England, Nos. 243-245, Oct.-Dec., 1895.

Nidiologist, The, III, Oct.-Dec., 1895.

Observer, The, VI, Nos. 10-12, Oct.-Dec., 1895.

Oregon Naturalist, The, II, Nos. 10-11, Oct.-Nov., 1895.

- Ornithologisches Jahrbuch, VI, Hefte 5 and 6, Sept.-Dec., 1895.
Ornithologisches Monatsberichte, III, Nos. 10-12, Oct.-Dec., 1895.
Ottawa Naturalist, The, IX, Nos. 7-9, Oct.-Dec., 1895.
Our Animal Friends, XXIII, Nos. 1-4, Sept.-Dec., 1895.
Proceedings Acad. Nat. Sci. Philadelphia, Part ii, April-Sept., 1895.
Proceedings California Acad. Sci., 2d Ser. Vol. V, pt. 1, 1895.
Proceedings and Transactions of the Nova Scotian Inst. Sci. VIII, 1895.
Records of the Australian Museum, II, No. 6, 1895.
Shooting and Fishing, XVIII, Nos. 22-26; XIX, Nos. 1-10, 1895.
Transactions of the Wisconsin Acad. Science, Arts and Letters, X, 1895.
Zoölogist, The, 3d Ser., XIX, Nos. 225-228, Sept.-Dec., 1895.
-

GENERAL NOTES.

Do Young Loons eat Fresh-water Clams?—On July 5, 1895, while paddling with my brother along the northern end of Lake Utopia, in the Province of New Brunswick, we saw near our canoe a young water bird which by its size and actions and especially by the cries of its parents near by, was proven to be a young Loon, the Great Northern Diver (*Urinator imber*). Wishing to examine it more closely we chased, and in spite of its game efforts to escape, caught it. When near by we noticed something hanging to its bill which plainly much retarded its movements and which proved to be a fresh-water clam or mussel of two inches in length. Closer observation after the bird was carried ashore showed that nearly all of its lower bill was gone and that its tongue was caught between the tightly-closed valves of the still-living mollusk, and was the means of attachment of the one to the other. I cut the tongue close to the shell and released the bird which went splashing and diving away to rejoin its parents, though without tongue or lower bill it could scarcely have survived for long. I broke the clam-shell and inside found the missing bill with the remainder of the tongue attached. The ragged end of the bill made it seem plain that having been thrust into the gaping shell, which promptly and firmly closed, it had been wrenched and torn off by the efforts of the bird to free itself, but the tongue yielding elastically to the strains did not give way. The Loon was a very young one in the downy stage with pin-feathers just appearing in the wings. The mussel and bill I now have, preserved for the inspection of the curious.

Since then I have looked in many books for something about the feeding habits of Loons but have found nothing. If it is a habit of theirs to eat these mussels, my specimen simply began too early; if not, either it was too enterprising or too curious and tried to pick out the inmate from its shell gaping open upon the bottom, or else while probing for something else in the sand it accidentally pushed its lower bill into the open shell, with the results above detailed. At all events the incident may show something to those fitted to interpret it.—W. F. GANONG, *Northampton, Mass.*

'Gull Dick' Again.—'Gull Dick' returned again (see Auk, IX, p. 227; X, p. 76; XI, p. 73; XII, p. 76) on the evening of April 6, 1895, in company with a young Gull. He being hungry was fed as usual, and after satisfying his appetite flew around the lightship and, in company with the young Gull, took his departure. I had but little hope that I should ever hear of his return. I was consequently agreeably surprised on receiving a letter from Captain Edward Fogarty, dated Oct. 2, 1895, informing me that 'Dick' had arrived that morning at sunrise for the twenty-fourth season. He looked in much better condition than last season, his feathers being smooth, with nothing of the ragged appearance he presented on his arrival last year. He seemed pretty hungry on being fed at 7 A. M. There was another Gull with him, but evidently not a friend, as 'Dick' would not allow him to partake of any of his breakfast.—GEORGE H. MACKAY, *Nantucket, Mass.*

An Early Description of *Phalacrocorax dilophus*.—The unpublished journal of David Thompson, of the old North West Company, Book No. 25, bound in Vol. XI, folio 46, date Thursday, May 9, 1811, when the celebrated traveller and surveyor was on certain headwaters of the Columbia River, has the following: "1 Cormorant. They are plenty. This had fine green eyes, the bill black, the eyelids marked with blue like very small beads to a button hole, and the neck and head a fine glossy bright black with a bunch of side feathers on each side the back of the head."—ELLIOTT COUES, *Washington, D. C.*

Another Harlequin Duck Record for Long Island.—A male Harlequin Duck (*Histrionicus histrionicus*) was shot at Orient Point (directly opposite Plum Island, L. I., where the species has formerly been taken) on November 11, 1895, and was mounted by a local bird stuffer. A female accompanied the male but was not procured. The male is now in the possession of Mrs. James Douglas of Orient, L. I.—W. W. WORTHINGTON, *Shelter Island Heights, N. Y.*

Olor buccinator in Western Minnesota.—It was not until 1893 that I observed this truly noble bird for the first time. Since then not less than seven specimens have come to my notice. The species is, however, not

at all common in this section. No captures were reported in 1894, while in 1895, four individuals were secured. Some of the oldest sportsmen tell me that they have observed this Swan quite regularly on Lac qui Parle during the spring and fall migrations. It is somewhat amusing to hear of the immense size of a Swan as reported by these gunners. Specimens weighing 50 pounds have been reported! The largest specimen I ever examined weighed 16 pounds and was very fat. A beautiful adult male now in my collection, shot near here on April 9, 1893, weighed only 15 pounds, but it was not fat. It measured as follows: length, 51.00; extent of wing, 77.00; wing, 28.00; tail, 7.00 inches.—ALBERT LANO, *Madison, Minn.*

White-faced Glossy Ibis Breeding in Minnesota.—I am glad to report that on June 22 and July 2, 1895, I took at Huron Lake, Jackson County, Minn., one mile from where two sets were taken in 1894, a set of three and one of four eggs (each complete) of the White-faced Glossy Ibis (*Plegadis guarauna*) from exquisitely suspended nests of rushes, in rushes, and two feet above eighteen inches of water in a large rushy arm of the lake. Four pairs of birds apparently were breeding in a colony of Black-crowned Night Herons, Coots, and Pied-billed Grebes. A single nest each of Ruddy Duck and of Red-head were found, the former fifty feet, the latter about eighty rods, from one of the Ibis nests. Two fine male Ibises were taken.

I have just received (Nov. 10) from the big woods, seventy-five miles southeast of here, a very large dark specimen of *Scotiapterx cinerea*.—P. B. PEABODY, *St. Vincent, Minn.*

Ardetta neoxena from Wisconsin.—The Field Columbian Museum has just come into possession of an additional specimen of this rare Bittern through the gift of Mr. C. E. Akeley. Mr. Akeley shot the bird, which is now before me—a mounted specimen—on Lake Koshkonong, Wis., May 22, 1893. It is a male in full plumage. Compared with the type of the species (No. 2001, Coll. Field Columbian Museum, Chicago) it agrees minutely above; below the throat and neck are just a trifle paler chestnut, and there is just a little more white on the abdomen. Mr. Akeley tells me no other examples were seen.—GEORGE K. CHERRIE, *Field Columbian Museum, Chicago, Ill.*

The King Rail Again in Maine.—An adult male King Rail (*Rallus elegans*) was shot in Falmouth, Maine, on September 19, 1895, by Mr. Walter Rich, of Portland, and is now in my collection. The township of Falmouth lies northeast of Portland, and the locality where the bird was taken was a brackish marsh known as 'The Dyke,' about two miles from the city, near the mouth of the Presumpscot River.—HENRY H. BROCK, *Portland, Me.*

Baird's Sandpiper in Maine.—During the autumn of 1895 I made but two visits to the seashore and shot but seven Peeps, yet I secured two Baird's Sandpipers (*Tringa bairdii*). I passed the forenoon of Sept. 7 on Scarborough Beach, where I found less than a dozen Peeps and shot only five. Four of these were Semipalmated Sandpipers, the other was a Baird's Sandpiper. On Sept. 14 I went to the beach again. In walking the entire length of it,—perhaps a mile and a half,—I saw but three Peeps. One of them escaped me. The others were shot together, and proved to be an *Ereunetes* and a Baird's Sandpiper.—NATHAN CLIFFORD BROWN, *Portland, Me.*

Baird's Sandpiper at East Hampton, Long Island, N. Y.—On Sept. 17, 1895, a Baird's Sandpiper (*Tringa bairdii*) was shot at East Hampton, Long Island, N. Y., and another bird of apparently the same species escaped. A Semipalmated Sandpiper was with them.—C. WHEATON VAUGHAN, *New York City.*

The 1895 Migration of *Charadrius dominicus* in Massachusetts.—Nantucket Island. The prevailing wind on August 13 was N. W.; on the 14th, east; on the 15th, S. W.; on the 16th, S. E.; on the 17th and 18th, S. W.; on the 19th, north; 20th, N. E. and N. W.; 21st, N. W.; 22d, N. E. to N. W.; 24th, west; 25th, N. E.; 26th, east; 27th, 28th, and 29th, N. W. The weather during the entire migrating period was pleasant with absence of storms or high winds. As a result these birds undoubtedly passed many miles outside of us, and only a few scattering Golden Plovers landed. On August 24 it was foggy outside the island with fresh southwest wind. The first Golden Plovers of the season were observed on this date, a flock of five at the west end of the island, flying towards the west. Two other single birds were seen at the eastern end of the island. On August 31 I saw a lone Golden Plover, and on September 1 a flock of four, one of which was shot, this being the first one taken this season. Later in the day four others were shot, three of which were *young* birds. In all twenty-four Golden Plovers were seen. On September 9 a flock of forty Plovers were seen at the west end of the island. This flock was also seen at the east end, and was probably the only *flock* on the island. On September 19 I saw seven Plovers in a certain preserved field near the centre of the island. I also saw three others, one of which was a young bird. These a friend and I shot. I heard of a small bunch of Plovers having been sent up from Tuckernuck on this date, but I did not see them. Up to September 15 only one Golden Plover had been taken on Tuckernuck Island.

Not an Eskimo Curlew (*Numenius borealis*) has been seen as far as I have been able to learn this season. I have made repeated inquiries in the large Faneuil Hall Market in Boston, but have failed to learn of any Eskimo Curlew, and of but a few Golden Plover which had been

taken on Cape Cod and at Ipswich, Mass. This meagre record is all I have to report for the season of 1895.—GEORGE H. MACKAY, *Nantucket, Mass.*

Habits of the Valley Partridge.—While collecting birds and mammals on the upper head of the San Diego River, near Lakeside, San Diego County, California, on June 6, 1895, I walked unsuspectingly upon a bevy of Valley Partridges (*Callipepla californica vallicola*), consisting of an old male and female with about fifteen young ones. They were in a crevice of a fallen cottonwood-tree. On my stepping almost upon them, the male bird ran out a few feet and raised a loud call of *ca-ra-ho*; while the female uttered short calls, addressed to her brood. Seeing me, she picked up a young one between her legs, beat the ground sharply with her wings, and made towards the bush, in short jumps, holding the little one tightly between her legs, the remainder of the brood following her.

Can any reader of 'The Auk' tell me if this is a common practice with this species?—FRANK XAVIER HOLZNER, *San Diego, Cal.*

Additional Records of the Passenger Pigeon (*Ectopistes migratorius*) **in Wisconsin and Illinois.**—I am indebted to my friend, Mr. John L. Stockton, of Highland Park, Ill., for information regarding the occurrence of this Pigeon in Wisconsin. While trout fishing on the Little Oconto River in the Reservation of the Menominee Indians Mr. Stockton saw, early in June, 1895, a flock of some ten Pigeons for several consecutive days near his camp. They were first seen while alighting near the bank of the river, where they had evidently come to drink. I am very glad to say that they were not molested.

Mr. John F. Ferry of Lake Forest, Ill., has kindly notified me of the capture of a young female which was killed in that town on August 7, 1895. The bird was brought to him by a boy who had shot it with a rifle ball, and although in a mutilated condition he preserved it for his collection.

I have recently received a letter from Dr. H. V. Ogden, Milwaukee, Wis., informing me of the capture of a young female Pigeon which was shot by Dr. Ernest Copeland on the 1st of October, 1895. These gentlemen were camping at the time in the northeast corner of Delta County, Mich. (Northern Peninsula), in the large hardwood forest that runs through that part of the State. They saw no other of the species.—RUTHVEN DEANE, *Chicago, Ill.*

The Golden Eagle in New Jersey.—Authentic records of the recent occurrence of the Golden Eagle (*Aquila chrysaetos*) in the Eastern States are so rare that each one seems worthy of note. The following instance happened in New Jersey, on the Crosswicks Creek, about seven miles south of Trenton. The bird was captured by my friend the Rev. W. E. Daw, now of Towanda, Pa., in the late fall of 1888, as near as can now be ascertained. I append part of a recent communication received from him in regard to the Eagle, in answer to my note of inquiry for particulars

regarding it. Efforts made to obtain more accurate information from the taxidermist as to the exact date of capture have entirely failed.

"In regard to the 'bird of freedom' my memory is very rusty as to the time when it was shot, but the place I remember distinctly. I was sitting in my boat up Crosswicks Creek, quietly waiting for squirrels in the chestnut woods of Alfred Reid (I being somewhat hidden by the bushes to which the boat was tied), when the Eagle sailed overhead, and was about to light in a tree when I fired a charge of duck shot and broke his wing near the shoulder. He fell in the water and was floating down stream when I fired squirrel shot in his head and he was still. I have looked up my diary but can find no record of the date when I shot him, but think it was late in the fall in 1888; time of day, about five o'clock. The bird is still in my possession. He measured 6 feet 4 inches from tip to tip. I am positive he is a Golden Eagle for he is feathered to the toes and has the characteristic arrow-head feathers on head."—WILLIAM C. BRAISLIN, *Brooklyn, N. Y.*

The Golden Eagle in Maine.—On August 19, 1895, Professor F. L. Harvey of the Maine State College and myself were making the ascent of Sandy River Mountain in northwest Maine. When we had nearly reached the summit of the mountain, we heard the cry of some raptorial bird, and a Golden Eagle (*Aquila chrysaetos*) soon appeared and flew around us uttering its cry. We remained at the top of the mountain for some time, during which the Eagle remained in our vicinity and seemed much disturbed at our presence. We both concluded that the bird had young somewhere in our vicinity, and as the south side of the mountain was a steep cliff, there is no reasonable doubt but that the bird had a nest somewhere on the cliff. When it uttered its cry we could hear answering cries from the direction of the cliff, thus making it evident that the bird had young in the vicinity.—ORA W. KNIGHT, *Bangor, Maine.*

A New Long Island, N. Y., Record for the Red-bellied Woodpecker (*Melanerpes carolinus*).—When visiting Mr. C. DuBois Wagstaff at Babylon, N. Y., last fall, I noticed a well-mounted specimen of this southern Woodpecker among a collection of local birds, and on inquiring the particulars of its capture, Mr. Wagstaff informed me that he shot it upon a locust tree close to the house, a year or two after the war. A specimen was shot by me in Flushing, N. Y., in October 1870, which I understood was the second record for Long Island, N. Y., but this bird antedates my specimen some years. The specimen in the collection of Mr. Geo. N. Lawrence, which was taken at Raynor South by a Mr. Ward, was killed many years ago and was, I believe, the first record for this locality.—ROBERT B. LAWRENCE, *New York City.*

The Deltoid Muscle in the Swifts.—In examining a number of Swifts recently I was struck with the fact that our common Chimney Swift (*Chaetura pelagica*) lacks the deltoid muscle. This is interesting as being

another instance of the specialization of the Swifts along various lines, and also as showing the structural variation among different members of the group. In *Macropteryx* the deltoid is well-developed and arises from two heads as in the Passeres. In *Cypseloides*, *Micropus*, *Collocalia*, and *Tachornis*, the deltoid is single and reduced in size, being proportionally smallest in *Tachornis*. Finally, as stated above, the deltoid is quite absent in *Chætura pelagica*, this being a step beyond what is found among the Hummingbirds, where the deltoid is present though small. It would be interesting to know if other members of the genus *Chætura* lack the deltoid, and also what is the condition of this muscle in *Hemiprocne*.

Dr. Shufeldt's figure of the wing muscles of *Chætura* (Linn. Soc. Journ. Zool. XX, pl. 22, fig. 29) shows that he too found this muscle absent, although nothing is said about it in the text.

I would be extremely grateful to any one for alcoholic specimens of *Hemiprocne* or any species of *Chætura* save *pelagica*.—F. A. LUCAS, Washington, D. C.

The Scissor-tailed Flycatcher in Virginia and Maryland.—My friend, Mr. P. Henry Azlett, of Azlett, King William County, Virginia, recently sent me for identification an adult specimen of this bird (*Milvulus forficatus*) which was shot by a farmer near that place on August 31, 1895. The bird is in poor, half moulted condition. This is, I believe, the fourth record of this bird for Virginia, and it is of course possible that some or all were escaped cage birds. The late Mr. O. N. Bryan of Bryan's Point, Maryland, on the Potomac River just below Washington, once told me that in August of a year about the close of the war while he was in a deep ravine near his home, called Johnson's Gully, he was overtaken by a severe storm, and saw one of these birds which had evidently sought the decision of the same place for shelter.—WILLIAM PALMER, Washington, D. C.

The Raven in Illinois.—I wish to place on record the capture of a specimen of *Corvus corax principalis*, at Mendosia, Ill., Oct. 23, 1892. I was at that time making a collection of birds for the State, and was living with the crew of the United States Fish Commission. The bird had been seen for a week or more previous to this time, flying about Lake Mendosia, a body of water opening into the Illinois River. The lake is seven miles long and three quarters of a mile wide. A number of attempts had been made by market shooters to obtain the bird for me, but they could not get within gunshot, and so were unsuccessful.

One day, however, as I was passing through a herd of cattle, the bird flew very low and I obtained it with a charge of number five shot. The specimen, a female, had been feeding upon carrion, and the odor from the body was as disagreeable as that from *Cathartes aura*. The plumage is exceptionally fine; the body is deep blue black; from the secondaries to the primary coverts, the color is rich brownish bronze. The following

measurements were taken: extent of wings, 4 feet 3 inches; length, 23 inches; tarsus, 2.20; tail, 10.00; culmen, 3.00; lanceolate feathers of throat, 2.70.

The specimen was sent to Mr. Ridgway for positive identification, and is, so far as known, the only *C. c. principalis* captured in Illinois. The specimen is now in the collection of the Chicago Academy of Sciences.—FRANK M. WOODRUFF, *Chicago, Ill.*

The Ipswich Sparrow.—A Correction.—Dr. Jonathan Dwight, Jr.'s, interesting monograph of the Ipswich Sparrow¹ brings into prominence a boyish and ill-advised note on this bird which I published in the 'Bulletin' of the Nuttall Ornithological Club (Vol. II, pp. 27, 28). I regret that I have left the note so long unexpunged; but it is not too late to mend the matter, and I withdraw the record now.—NATHAN CLIFFORD BROWN, *Portland, Me.*

Second Occurrence of the Lark Sparrow in Virginia.—While collecting on the 'Dry Isaacs' (one of the sandy islets on the ocean side of Cape Charles) on August 24, 1895, I flushed from the grass an immature male *Chondestes grammacus*, which after considerable trouble, owing to its wildness, I secured.—WILLIAM PALMER, *Washington, D. C.*

The Cape May Warbler (*Dendroica tigrina*) in the Maritime Portions of South Carolina.—On September 13, 1895, I shot an adult male Cape May Warbler from the top of a live-oak tree. It was in company with many other Warblers, all being busily engaged searching for insects. The next day I procured another male which I shot from the same tree. Previous to this date there was much stormy weather accompanied with heavy rain which lasted for eight days. The Cape May Warbler is a very rare bird in the maritime districts of South Carolina, and these two are the only individuals which have ever been taken on the seaboard.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Carolina Wren in Connecticut.—While collecting in a grove about five miles from Bridgeport, April 20, 1895, Dr. E. H. Eames and the writer found two Carolina Wrens (*Thryothorus ludovicianus*) occupied in running about a stone wall. On June 13, we found both old birds and shot two young ones. The young, which had probably been out of the nest a week, had only a faint chirp and were not as active as the adults.—H. H. TAYLOR, *Bridgeport, Conn.*

The Red-breasted Nuthatch (*Sitta canadensis*) on Long Island, South Carolina.—I shot a beautiful adult male of this Nuthatch within ten yards of the front beach on November 14, 1895, on Long Island, S. C. It was

¹ Memoirs of the Nuttall Ornithological Club, No. II. Cambridge, Mass., August, 1895.

about one o'clock P. M., when, as I was sitting on some drift wood where the tide was coming in, I heard just over me *hink, hink, hink*. I had never heard this note before but I remembered Audubon's description, and truly there was the Red-breasted Nuthatch, which I had looked for in vain for twelve years, directly over me. There were two of them. The male I secured, but the female, which I badly wounded, I could not find. This species has never been taken in the maritime districts before, but has been recorded from Chester County, and my friend Mr. Ellison A. Smyth, Jr., shot one many years ago in Clarendon County. I have seen Mr. Smyth's bird and I believe it was recorded in 'Random Notes on Natural History.'—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Dwarf Thrush in Colorado.—A specimen of the Dwarf Thrush (*Turdus aonalaschkeæ*) was taken October 6, 1895, at Magnolia, a small mining town some eight miles west of Boulder, Colorado. This is the first record of the species for this State. To make sure of the identification the bird was sent to Mr. Ridgway, who pronounced it a typical example of this species.—U. A. SPRAGUE, *Boulder, Col.*

Food of Woodpeckers and Flycatchers.—Southern California seems well adapted to the birds of the family Picidæ. I have been at Claremont, Los Angeles County, less than two years, and have had little time to work with birds, yet I have secured the following species: *Dryobates villosus harrisii*, *Xenopicus albolarvatus*, *Sphyrapicus ruber*, *Sphyrapicus thyroideus*, *Melanerpes formicivorus bairdii*, *Melanerpes torquatus*, and *Colaptes cafer*. In the stomach of all these I have found insects, and often more or less bark. *Melanerpes formicivorus bairdii* has the habit of storing acorns in trees, presumably for future use as food. They gather the acorns and place them in holes which have been previously chiseled out by use of their bills. I have heard reliable observers state that they have frequently seen them eating these acorns during the winter months. *Sphyrapicus ruber* is the Sapsucker of southern California. It taps fruit trees, especially prune and apricot, and evergreens. Its mischief seems much more serious than that of its congener of the East, as trees are frequently killed by reason of its punctures, although these latter are more distant and less numerous. I never knew a tree to be killed by the Sapsuckers in Michigan. The evil in California is wrought in summer when the dry season has enfeebled the tree, and this is a possible explanation of the more serious harm to the trees of this region.

I have also been interested in the species of the family Tyrannidæ. I have taken at Claremont and the adjacent cañons the following species: *Tyrannus verticalis*, *Tyrannus vociferans*, *Myiarchus cinerascens*, *Sayornis sayi*, *Sayornis nigricans*, *Contopus borealis*, *Empidonax pusillus*, and *Empidonax difficilis*. In the stomach of all these were found insects; but

twice I found a strange exception to the usual food of the birds of this family. In two cases I found green olives in the stomach of *Tyrannus verticalis*, and in nearly all birds of the common species *Sayornis nigricans*, killed in winter, I have found pepper berries. *Tyrannus verticalis* is the Bee-martin of California. It flies from its perch near the apiary, captures its prey, then flies back to its perch, making some rapid motion, after which it swallows the bee. I have seen a toad swallow five bees in quick succession; then have killed the toad to find five bee stings sticking to its throat, and as many stingless bees in its stomach. Does the throat of the Kingbird become a sort of pin-cushion for bee stings, or does this bird extract the stings as it manipulates the bee before swallowing? I am eagerly waiting to settle this interesting question. I have taken worker bees from the stomach of the eastern Kingbird (*Tyrannus tyrannus*) but never noticed regarding the disposition of the stings. None of the Kingbirds which I have taken in California have had bees in their stomach, though I am told by good observers that this bird does capture and swallow bees.—A. J. COOK, *Claremont, Cal.*

Rare Visitors to the Connecticut River Valley in Massachusetts in 1895.—*Seiurus motacilla*.—On the 28th day of July, a Louisiana Water Thrush was found dead, on the piazza of a house in the central part of Springfield, undoubtedly having been killed by flying against a window. The capture of a specimen by Dr. J. A. Allen on Mount Tom in April, 1869, is the only other record of its occurrence here.

Rallus elegans.—October 19, a young King Rail was taken in Longmeadow. It was found in the *Zizania aquatica* which grows so profusely along the banks of the Connecticut River. The presence of this species in this part of the valley, I believe, has never before been noted; and the Clapper Rail (*Rallus longirostris crepitans*) has been captured here but twice.

Calcarius lapponicus.—A Lapland Longspur was shot in Longmeadow, November 28.—ROBERT O. MORRIS, *Springfield, Mass.*

A Correction.—In 'The Auk' for April, 1892 (Vol. IX, p. 144), in a note on the 'Habits of the Black-bellied Plover in Massachusetts,' I stated it as my conviction that the *adults* do not assume the gray and white winter plumage after having attained to the full adult spring plumage. I also expressed the same opinion in regard to the plumage of the *adult* Knots in 'The Auk' for January, 1893 (Vol. X, p. 32) in 'Observations on the Knot, *Tringa canutus*.' I now desire to withdraw both of these opinions, as I am inclined to doubt, although not yet *certain*, the correctness of such views, but believe it much better to so state, rather than let a probable error remain to misguide others.—GEORGE H. MACKAY, *Nantucket, Mass.*

Notes on Long Island Birds.—*Melospiza lincolni*.—In the Parkville woods along the edge of a thicket, a small, active sparrow was seen on the morning of Sept. 28, 1895. A recent moderate fall of temperature made the morning an animated scene of bird-migration, and this bird would hardly have attracted attention among many other small birds had it not been for his alert and ill-at-ease manner. This fact alone led me to think him not a Song nor a Savanna Sparrow, either of which he might readily have been mistaken for. He made no sound by means of which aid could be gained in his identification, but stood on the horizontal limb of a small tree, with jerking tail and erected occipital feathers, as though resenting the gaze of an intruder. It proved a Lincoln's Sparrow. The specimen is an adult female.

Vireo gilvus.—On the morning of Sept. 16, 1895, while on the Boulevard just beyond Prospect Park, Brooklyn, I was attracted by a sustained melodious warble, which for the moment I was unable to place, but which I afterward remembered having been formerly fairly familiar with in New Jersey as the supposed song of the Warbling Vireo. I had never verified this supposition as it had always been heard in the shade trees of village streets. In this case the bird was in one of the outer of the four rows of shade-trees which extend the length of the Boulevard. At my approach it flew into one of a cross row of maple trees, about forty yards from that in which it had first been heard, where it was secured. It proved to be an adult male Warbling Vireo—a bird which on Long Island I had often searched and listened for in vain. For some reason, this bird on Long Island is either rare or often overlooked. The latter seems the less likely in that its song is very characteristic, as well as being one of the sweetest, and most apt to attract attention of all our singing birds. Its song is a refrain of trilled notes, varying up-hill and down in harmonious modulations, with only the merest pause between each effort of, it must be, twenty-five or thirty notes.

Helminthophila peregrina.—On the same morning on which the Lincoln's Sparrow was obtained (Sept. 28, 1895), and but a few minutes later, a specimen quite as rare was captured; namely, the Tennessee Warbler. This bird was in the woods and when first seen was on the ground, from whence it flew into the low pendant branches of a tree, about four feet from the ground. No bird-note that I could identify as his was heard. The specimen is an adult male.

Dendroica tigrina.—At Canaïsee Village, Sept. 12, 1894, a Warbler of rather obscure markings was taken in the edge of a little grove of trees which stands back but a few yards from the salt-grass meadows. This and a male Black-throated Blue Warbler were seen in the lower branches of a thickly foliated tree overhanging a heavy undergrowth of blackberry brambles and tall weeds. It was rather carelessly labeled as a Magnolia Warbler, which, of course, it does not in the least resemble. It was rediscovered and my diagnosis of it as the Cape May Warbler was kindly verified by Mr. Chapman. The specimen is an adult female.

Dendroica castanea.—In the outskirts of the village of Flatbush, now a part of Brooklyn, on the morning of Sept. 24, 1895, a number of Warblers, chiefly Black-polls, was seen in a row of shade trees, not far from the Boulevard. Among them was a Bay-breasted Warbler, which was secured. It is an immature male with the buffy markings on the sides well developed.—WILLIAM C. BRAISLIN, *Brooklyn, N. Y.*

Nantucket and Muskeget Island Notes.—**Falco sparverius.**—Nantucket, Sept. 22, 1895, I observed eight American Sparrow Hawks, in pairs, migrants; none noted before this season. Usually see a few about this time.

Asio accipitrinus.—Muskeget Island, June 2, 1895. Mr. John R. Sandsbury informs me that he discovered the nest of a Short-eared Owl on the northeast side of the island containing three young birds in the down. The nest was placed at the foot of a bunch of beach-grass (*Ammophila arundinacea*) and partially concealed. It was raised about four inches above the sand; only one old bird was seen, it having been frightened off the nest. On July 7 Mr. Sandsbury and I saw one adult bird.

Symphemia semipalmata.—Nantucket. On May 2, 1895, Mr. Charles E. Snow informed me he saw five Willets at the Hummock Pond.

Totanus solitarius.—In the vicinity of the Hummock Pond, more Solitary Sandpipers have been noted this season than for a number of years. On Aug. 29, 1895, one female was taken; on Sept. 9, three more; Sept. 10, another; on Sept. 29, I saw still another. They were formerly quite abundant, but are now scarce.

Ereunetes occidentalis.—Aug. 29, 1895. Four birds taken at the Hummock Pond, three of which proved on dissection to be females. These are the only ones I have observed here.

Macrorhamphus scolopaceus?—Aug. 29, 1895. A male bird (by dissection) was taken at the Hummock Pond. This being a young bird of the year, it is next to impossible to *certainly* identify it. *M. griseus* is not uncommon here, but this is the *first* instance in which I have taken what I suppose to be *M. scolopaceus*.

Micropalama himantopus.—On Aug. 29, 1895, a female was taken at Hummock Pond. On Aug. 31, I shot another at the same place. This pond is a very large one. On Aug. 29, with some friends, aided by a horse and scoop, I dug a trench to the ocean, thereby draining it, hoping that the margins thus exposed would offer an inducement for some of the migrants to tarry.

Oidemia deglandi.—Sept. 28, 1895. A very large flock of White-winged Scoters were observed on the edge of Squash Meadow Shoal.

Larus argentatus smithsonianus.—Muskeget Island, Nov. 1, 1895. The very large increase in the number of Herring Gulls in this vicinity has been remarked by all; nothing similar has been observed for years. The northeast point of Muskeget, as also the shoals about Gravelly Island, are covered with them in the morning, indicating that they roost there.—GEORGE H. MACKAY, *Nantucket, Mass.*

Gätke's Birds of Heligoland.—No work since the days of Audubon has come to my notice which has interested me to the same extent as this wonderfully instructive book. One reason for this is that the knowledge I have acquired regarding some of our birds has been gleaned during my long experience as a sportsman on the Atlantic seaboard. (It is now many years since I learned that the most successful way of securing birds is through a knowledge of their habits.) I cannot therefore fail to recognize and appreciate how dwarfed become the observations of the ordinary observer in comparison with the life work of Mr. Gätke, who has for half a century so patiently gathered the facts he now sets before the ornithologists of both continents. It seems impossible to read Gätke's book without being impressed with the importance of his many years of painstaking research, and his originality and boldness of thought. As Dr. Coues has rightly written in his review of this book in the last number of 'The Auk' (Vol. XII, p. 322), 1895: "There is no Heligoland but Heligoland, and Gätke is its prophet." It is nevertheless equally true that all of the statements contained in this work cannot be accepted as facts, as far as they relate to North American birds. For this reason I desire to call the attention of American readers of the book, as well as others, to certain of the author's claims regarding some American birds which he refers to in illustration of certain of his statements. I do this with the greatest deference.

On page 16, five lines from the foot of the page, we read: "When one thinks of numbers of individuals such as these, which cannot be grasped by human intelligence, it seems absurd to talk of a conceivable diminution in the number of birds being effected through the agency of man." In North America, such a statement, in my opinion, can scarcely be assented to, as witness the destruction of American Golden Plovers (*Charadrius dominicus*), Eskimo Curlews (*Numenius borealis*), and Bartramian Sandpipers (*Bartramia longicauda*), as also other species, in the Mississippi Valley during the spring migration to their northern breeding grounds. Also witness the fabulous quantities of eggs of the Water-birds taken in the far Northwest, as also on the Northeast coasts of North America.

On page 44 he says: "We have stated in the course of this chapter that birds perform the journey from their winter quarters to the breeding stations, if possible, in one uninterrupted flight." In North America, as far as my observation shows, the reverse is the case with some of the Water-birds. The American Golden Plovers, Eskimo Curlews, Bartramian Sandpipers, and Black-bellied Plovers (*Charadrius squatarola*) all linger in the Mississippi Valley, and the last named on the Atlantic coast, on their way to their breeding grounds.

On page 51, in writing of Diving Ducks, etc., he says: "All these birds when alive and undisturbed (as also do their carcasses) float so lightly on the water that they scarcely make any noticeable depression in it." I have always regarded the three varieties of Scoters (*Oidemia americana*,

O. deglandi, *O. perspicillata*), the American Eider (*Somateria dresseri*), Double-crested Cormorant (*Phalacrocorax dilophus*), Canvas-back Duck (*Aythya vallisneria*), and Loon (*Urinator imber*), as well as some others, as noticeably deep swimmers, and not very buoyant when dead and floating.

On page 69: "The distance between the coasts of the two countries [Labrador and northern Brazil], amounts to three thousand two hundred geographical miles, and since there is along this whole stretch of route not a single point on which the travellers could alight for rest, they are obliged to perform the whole length of this enormous journey in one uninterrupted flight." After coming down from the shores of the Arctic Ocean and the region above forest growth, their breeding home, the American Golden Plovers (as do also the Eskimo Curlews) collect in the vicinity of Labrador, where they rest a while, becoming very fat. From there they set out on their prolonged southern migration, steering boldly out to sea after leaving Nova Scotia. I believe they can, under favorable conditions, make the entire distance to their objective point, the Argentine Republic and Patagonia, in practically one flight, but if during such passage they require rest, they can easily obtain it by alighting on the ocean. This they do, being good swimmers. Neither are they exceptional in this respect, many others doing the same. As an instance in illustration one of my shooting acquaintances while fishing one day about three miles off the coast of Massachusetts observed a flock of a dozen or fifteen Pectoral Sandpipers (*Tringa maculata*) passing; on whistling to them they abruptly turned from their course in response to his call, and flying towards his boat, whirled up into the wind and *alighted on the ocean*. After swimming around a short time they arose without effort, and, each bird giving its feathers a shake, proceeded on their way.

On page 101, he quotes Palmen as saying: "Direct observations in nature have yielded the result that among flocks of migrants the older and stronger individuals are in general the leaders of the migratory host"; and adds: "He [Palmen] could not, however, have begun the treatment of this question with a more unfortunate assertion; for there is no one who has ever made observations which might support this view." I have made observations for a good many years on the Atlantic coast of North America, and I have particularly noticed many times during the migration northward of the Surf Scoters (*Oidemia perspicillata*) in April, that many of the larger flocks of fifty to one hundred birds, are led by a full plumaged adult drake. The white markings on the head and neck, highly colored bill, and glossy black plumage render a mistake in identification unlikely.

Page 102, he thus formulates his conclusions on this subject: "1. That under normal conditions in the case of the three hundred and ninety-six species occurring here, with the exception of a single one, the autumn migration is initiated by the young birds, from about six to eight weeks after leaving their nests. 2. That the parents of these young individuals

do not follow till one or two months later." Taking the American Golden Plover again as an illustration, I must say that without a single exception my observations show results directly opposite, the adults always preceding the younger birds, usually from one to three weeks. It is not unusual for the adults and young to migrate together, but I have no knowledge of the young arriving first on the New England coast. A few examples from my note book may not be out of place. On the night of Sept. 11, 1889, amidst rain, fog, and southeast wind, Eskimo Curlews and Golden Plovers, with a few young birds of the latter, landed on Nantucket Island, Massachusetts. On August 25, wind fresh south by east, and night of the 26th, 1892, there was a large flight of adult American Golden Plovers (the second large flight of this month), some two hundred and seventy-five of which were shot. It was not until September 1 that the first young bird of the season was noted; the first flock (about 25 birds) was noticed on September 3, two of which were shot. On September 15, I noticed two flocks of young birds containing thirty and twenty-five birds respectively. The larger flock, after mounting high up in a spiral way and circling, headed southwest on migration. There was not one black and white breasted bird in that flock, and this goes to prove that these young birds can, if necessary, migrate by themselves. But according to my observations, most of the flocks of young birds that land on the island of Nantucket while on their southern migration (they never return via the Atlantic coast in the spring) contain one or more adults, that is, until *late* in the season and the old birds have passed by, at which time we find few, if any, adults in the flocks with the young birds. Neither do the young birds seem to care to join at this later date with the adults, if there are any living in the vicinity. On September 11, 1894, I shot eleven young birds, the first noted that season. They must have landed the previous night, as all those previously seen were black and white breasted birds, of which I shot fifteen on the 27th of August. In 1888, up to September 8, a friend and I had shot seventy-three black and white breasted birds, but did not see a young bird until that date. On the night of September 24 or 25, 1882, over one thousand young Golden Plovers (Palebellies) landed on Nantucket Island during a northeast rain storm. I shot forty-nine of them the next day. Not a single black and white breasted bird passed me that day, nor did I hear of one being shot. I instance this out of regard for Mr. Gätke's view, that the young birds can and do migrate by themselves. I might give many more instances of the case in point, but they would be only repetitions with other dates.

Again, page 471, with reference to his statements respecting *Charadrius squatarola*, I may say that with us, the adults arrive first in the middle of July, while it is not usual to see more than scattering young birds before the first week in September (see Auk, Vol. X, p. 79). Again (see Gätke, page 499), the adult Knots (*Tringa canutus*) with us precede the young, the former appearing during the latter part of July, the young from the latter part of August to September 10.

On this coast, as far as I know, the adults of the Eskimo Curlew (*Numenius borealis*) arrive first. I merely mention it, as this bird is very closely allied to the Whimbrel (*Numenius phaeopus*) (see Gätke, page 460). This is also the case with the Hudsonian Curlew.

Judging from the twenty-five years' shooting experience of one of my friends at one of the larger fresh water ponds in Massachusetts, where the shooting of Canada Geese (*Branta canadensis*) has been made a specialty, it appears that they migrate in broods. It makes little difference how many birds may be travelling in company, for on alighting in the pond (unless in very stormy weather) they separate, each gander and goose with their young keeping together, the gander leading.

My observations in relation to rate of speed and length of flight lead me to believe that under very favorable conditions, such as flying before a very strong wind, such birds as the American Golden Plover and Eskimo Curlew for instance, will attain a speed of one hundred and fifty to two hundred miles an hour. It is consequently not inconceivable to me that under such favorable conditions they are able to reach the Argentine Republic or Patagonia in one flight, or with a possible rest on the ocean. Hence I cannot regard a flight, under favorable circumstances across the Atlantic ocean, as any great hardship to many of our birds.—
GEORGE H. MACKAY, *Nantucket, Mass.*

CORRESPONDENCE.

The Soaring of Birds and Currents of Air.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs,—Allow me to call the attention of ornithologists to the following question in which ornithology and meteorology join hands.

In recent years, wind vanes have been devised to indicate the vertical component of the wind's motion, and it has been shown that there is a significant variation in the strength of this component in various kinds of weather. It has long been known that the diurnal variation of wind velocity on land was due to local convectional ascending and descending currents, these varying greatly at different times and places, according to the nature of the land surface, the strength of sunshine, etc.

In recent years, attention has frequently been called to the importance of vertical currents in air movement as an aid in the flight of birds, Professor Langley's studies being perhaps the most important in this direction.

Now the question that I should like to have jointly considered by ornithologists and meteorologists, is whether there is a correlated variation in the flight of soaring birds and in the activity of local convectional movements, or other vertical movements. Do soaring birds float for a longer time without flapping wings in weather when convectional ascending currents are indicated, or in localities where disorderly ascensional currents, prompted by irregularity in the land surface, may be expected? A pair of observers, one attending to the behavior of birds, the other following out the processes of the winds, might perhaps discover some interesting correlations in this field of study. The work might be commended to semi-invalids, who are sent South in search of mild weather and gentle occupation. Could anything be more genially lazy than lying on one's back in the sun, and counting the turns of a Turkey Buzzard?

Very truly yours,

W. M. DAVIS.

Cambridge, Mass.

November 3, 1895.

NOTES AND NEWS.

THOMAS HENRY HUXLEY, an Honorary Member of the American Ornithologists' Union, died June 29, 1895, at his home in Eastbourne, England, in the 71st year of his age, having been born at Ealing, Middlesex, England, May 4, 1825. His early education was obtained partly at home and in part "at the semi-public school at Ealing, of which his father was one of the masters." In 1842, he entered the medical school of Charing Cross Hospital, and in 1845 passed the first M. B. examination at the University of London. The following year he joined the medical service of the Royal Navy, and was soon after assigned to the post of assistant surgeon to H. M. S. 'Rattlesnake,' which sailed from England late in the year 1846 for a surveying cruise in the Southern Seas, and thence around the world, returning to England in 1850. In recognition of his scientific work during this voyage, he was elected in June, 1851, a fellow of the Royal Society. He left the naval service in 1853, and in 1854 was appointed naturalist to the Geological Survey, and also made professor of natural history in the Government School of Mines, which latter position he occupied till 1885. From 1863 to 1869 he was Hunterian professor at the Royal College of Surgeons. He was president of the Geological Society of London in 1869 and 1870, president of the British Association for the Advancement of Science in 1870, and of the Royal

Society in 1883. Between 1870 and 1885, when impaired health compelled his retirement, he filled numerous government positions, including, from 1881 to 1885, that of Inspector of Salmon Fisheries.

To quote from Professor Haeckel's memorable notice of Professor Huxley's work, published in 1874 (*Nature*, IX, Feb. 5, 1874, pp. 257, 258): "Indeed if at the present we run over the names distinguished in the several sciences into which Natural Knowledge may be divided—in Physics, in Chemistry, in Botany, in Zoology—we find but few investigators who can be said to have mastered the whole range of any one of them. Among the few we must place Thomas Henry Huxley, the distinguished British investigator, who at the present time justly ranks as the first zoologist among his countrymen. When we say the first zoologist, we give the widest and fullest signification to the word 'zoology' which the latest developments of this science demand. Zoology is, in this sense, the entire biology of animals; and we accordingly consider as essential parts of it the whole field of Animal Morphology and Physiology, including not only Comparative Anatomy and Embryology, but also Systematic Zoology, Palæontology and Zoological Philosophy. We look upon it as a special merit in Prof. Huxley that he has a thoroughly broad conception of the science in which he labors, and that, with a most careful and empirical acquaintance with individual phenomena, he combines a clear philosophical appreciation of general relations.

"When we consider the long series of distinguished memoirs with which, during the last quarter of a century, Prof. Huxley has enriched zoological literature, we find that in each of the larger divisions of the animal kingdom we are indebted to him for important discoveries. From the lowest animals, he has gradually extended his investigations up to the highest, and even to man. His earlier labors were, for the most part, occupied with the lower marine animals, especially with the pelagic organisms swimming at the surface of the open sea. . . . But it is the comparative anatomy and classification of the Vertebrata which, during the last ten years, he has especially studied and advanced. . . . After Charles Darwin had, in 1859, reconstructed this most important biological theory, and by his epoch-making theory of Natural Selection placed it on an entirely new foundation, Huxley was the first who extended it to man, and in 1863, in his celebrated three Lectures on 'Man's Place in Nature,' admirably worked out its most important developments. With luminous clearness, and convincing certainty, he has here established the fundamental law, that, in every respect, the anatomical differences between man and the highest apes are of less value than those between the highest and the lowest apes."

Huxley's work on birds may be regarded as an incident in his general work on the morphology and classification of Vertebrates, although his contributions to ornithological literature place him in the front rank among investigators of the affinities and relationships of the various groups of birds to each other, and of birds as a class to other Vertebrates;

for in the ordinary sense of the term Huxley was not an ornithologist. As early as 1864 he marshalled birds with reptiles under one grand division, or 'province' of the Vertebrata under the name Sauropsida, opposed on the one hand to the Mammalia, and on the other to the Ichthyopsida, consisting of fishes and amphibians. His principal and epoch-making ornithological memoir appeared in 1867, entitled 'On the Classification of Birds; and on the Taxonomic Value of the Modifications of certain of the Cranial Bones observable in that Class' (P. Z. S., 1867, pp. 415-472, with 36 figs. in text; see also *Ibis*, 1868, pp. 357-362). This was followed in 1868 by his important paper 'On the Classification and Distribution of the Alectoromorphæ and Heteromorphæ' (P. Z. S., 1868, pp. 294-319, with a map and 16 figs. in text). These two papers may be considered as his principal special contributions to the literature of ornithology. While a synopsis of these papers is perhaps uncalled for in this connection, it is of interest to note the insistence—then a novel idea—here made (P. Z. S., 1867, p. 415) "that in all the essential and fundamental points of their structure" birds so nearly approach reptiles "that the phrase 'Birds are greatly modified Reptiles' would hardly be an exaggerated expression of the closeness of that resemblance." Professor Huxley's classification, as is well known, was based primarily, and, in case of many of the minor groups, almost solely on the palatal structure, thus giving prominence to an unquestionably important set of characters previously almost overlooked. As is inevitably the case with any classification based on a single set of characters, the allocations here and there are bound to be more or less unnatural, and Huxley's scheme is not an exception. Yet the importance of his memoirs can scarcely be overrated, and their influence has been far-reaching.

In common with most of the learned societies of the world, the American Ornithologists' Union has honored itself in its attempt to show respect to Professor Huxley by enrolling him in its list of Honorary Members,—as much perhaps in recognition of his eminent attainments in all fields of biological research as in the special field of ornithology.

Any notice of this great man would be reprehensibly incomplete without some further reference to his wonderful influence upon the scientific thought of his time, and his rare gifts as a writer and lecturer. In his battles for evolution he has upheld unflinchingly what he believed to be scientific truth, and with a boldness and efficiency that has no parallel. As a fitting conclusion to this brief notice may be added the following selections from his own words: "To promote the increase of natural knowledge and to forward the application of scientific methods of investigation to all the problems of life to the best of my ability, in the conviction which has grown with my growth and strengthened with my strength, that there is no alleviation for the sufferings of mankind except veracity of thought and of action, and the resolute facing of the world as it is when the garment of make-believe by which pious hands have hidden its ugliest features is stripped off.

"It is with this intent that I have subordinated any reasonable, or unreasonable, ambition for scientific fame which I may have permitted myself to entertain to other ends; to the popularization of science; to the development and organization of scientific education; to the endless series of battles and skirmishes over evolution; and to untiring opposition to that ecclesiastical spirit, that clericalism, which in England, as everywhere else, and to whatever denomination it may belong, is the deadly enemy of science.

"In striving for the attainment of these objects, I have been but one among many, and I shall be well content to be remembered, or even not remembered, as such."

MR. HENRY SEEBOHM, an Honorary Member of the American Ornithologists' Union, died at his home in London, Nov. 26, 1895, after a short illness, although he had been in weak health since an attack of influenza some six months previously. According to a recent notice in the London 'Times,' Mr. Seebohm "came of an old Quaker family, and was born at Bradford, in Yorkshire, where as a child he showed an extraordinary love of natural history, and used to study every kind of animal which was to be met with on his father's property. He was educated at the Friends' School at York, where his love of nature still showed itself in the collections of ferns, birds, and their eggs, which he began to make at the time. For many years afterwards he was immersed in business at Sheffield, where he became very successful as a steel manufacturer; but all through his business struggles he never lost his attachment for ornithology, and made short expeditions to various parts of Europe to gain an original experience of the habits of birds for his 'History of British Birds,' which he had in contemplation. In the course of these studies he visited most of the countries of Europe, Greece, Asia Minor, Russia, Norway, Denmark, Heligoland, many parts of Germany and Austria, the Engadine, Holland, and parts of France. In company with Mr. J. A. Harvie-Brown he undertook, in the summer of 1875, his celebrated expedition to the valley of the Lower Petchora, in northern Russia, in quest of the eggs of the Gray Plover and the Little Stint, both of which they managed to find, though they did not succeed in discovering the eggs of the Curlew Sandpiper. In 1877 he went alone to the valley of the Yenisei, in Siberia, and again obtained important ornithological results. On this occasion his ship was wrecked, and he built another, which he named the 'Ibis,' and in which he successfully returned to England by the North Cape."

In addition to numerous important papers in various scientific journals, Mr. Seebohm is the author of several monographs and faunal works of high value, among which are his 'Catalogue of the Turdidæ' (1881), forming Volume V of the British Museum Catalogue of Birds¹; 'A His-

¹ Cf. Bull. Nutt. Orn. Club, VII, pp. 99-104.

tory of British Birds' (2 vols., 1883-84)¹; 'The Geographical Distribution of the Charadriidæ, or the Plovers, Sandpipers, Snipes, and their Allies' (4to, 1888)²; 'The Birds of the Japanese Empire' (1 vol. 8vo, 1890)³; 'Classification of Birds: an attempt to diagnose the Subclasses, Orders, Suborders, and some of the Families of existing Birds' (1890).⁴ His two chief works of travel—'Siberia in Europe' and 'Siberia in Asia'—have attained well-merited popularity, on account of the interest of the regions visited and the pleasant manner in which the narratives are presented.

Mr. Seebohm was an earnest and original investigator and a vigorous and at times a somewhat aggressive writer. He was also untrammelled by precedents and traditions, which to some extent detracted from the utility of his work, but on the other hand gave him an independence that favored the development of new lines of thought and the adoption of new methods.

MR. HENRY T. WHARTON, a Corresponding Member of the American Ornithologists' Union, died recently at his home in Hants, England. Mr. Wharton was a well-known expert on British birds, an important list of which was published by him in 1877. Mr. Wharton was also Secretary and General Editor for the B. O. U. Committee, appointed in 1878 to draw up a list of British Birds, which was finally published in 1883. Mr. Wharton not only acted as editor, but contributed the etymological notes relating to the scientific names.

WE REGRET to learn that Volume II of Major Bendire's 'Life Histories of North American Birds,' although in type since last July, is not likely to be issued for several months, owing to delays in the Government Printing Office at Washington.

Two courses of ornithological lectures are to be given as the third series of Biological Lectures at Columbia College, New York, during January 1896, the courses being respectively by Mr. Frank M. Chapman, Assistant Curator of Ornithology in the American Museum of Natural History, and by Professor C. Lloyd Morgan, F. R. S., of University College, Bristol, England, author of 'Animal Life and Intelligence.' The courses will consist of four lectures each, and will be given in the Hall of the Academy of Medicine, 17 West 43d Street at 5 P. M. on Tuesdays and Fridays. Mr. Chapman's course will be on 'The Distribution, Migration, Nesting, Colors, and Structural Adaptations of Birds,' and will occur on January 7, 14, and 28, and February 4. Professor Morgan's course is entitled 'The Instincts of Birds in Relation to Habit and Inheritance,' and will be given on January 10, 17, 24, and 31. Tickets for the two courses may be procured at the College offices or at the Biological Department of the University.

¹ Cf. Auk, II, pp. 88-91.

³ Ibid., VIII, pp. 99-101.

² Ibid., V, pp. 189-194.

⁴ Cf. Ibis, 1890, pp. 379-381.

THE KENT ORNITHOLOGICAL CLUB was reorganized at Grand Rapids, Mich., on Dec. 12, 1895, under the name of the Michigan Ornithological Club. The following officers were elected for 1896: A. B. Durfes, President; R. R. Newton, Vice-President; W. E. Mulliken, Secretary; Prof. C. A. Whittemore, Treasurer; Leon J. Cole, Librarian.

The Club will take up a systematic study of the birds of the State and it is hoped all Michigan ornithologists will address the Secretary, 191 First Avenue, Grand Rapids, Mich., for particulars at once.

AT THE Thirteenth Congress of the A. O. U. Mr. William Dutcher, in behalf of the 'Committee on Protection of North American Birds,' stated that the same precautions had been taken during the breeding season of 1895 as in 1894, regarding the protection of Terns on Great Gull Island, New York. A special game protector had been employed, several of the Natural History Societies of New York City contributing toward the payment of his salary. Absolutely no shooting had been done and parties who visited the island during the summer were prevented from collecting eggs. As Great Gull Island is the property of the United States Government it will always be a breeding ground for Terns, if properly protected. The number of birds now in the colony on this island was estimated at 3500—a large increase from the previous year. Mr. Dutcher thought that the numerous cottages now built and being erected on all portions of the New York coast would prevent the Terns from again nesting there.

Mr. William Brewster said that the Terns on Muskeget Island, Mass., had increased from year to year, the result of protection. No birds had been shot on or near the island the past year and very few eggs had been collected. A notable increase was seen also in the colony of Laughing Gulls at the same place. Great credit is due Mr. Geo. H. Mackay for his continuous efforts in saving the Gulls and Terns on this island from destruction.

Mr. Witmer Stone knew of only one colony of Terns on the New Jersey coast. As the birds nested back in the meadows and away from the coast, it was difficult to protect them, but he did not think they decreased in numbers. In recent years the 'egggers' (so-called) had destroyed immense numbers of the eggs of the Clapper Rail which nested in favorable localities along the coast of New Jersey. This Rail had increased the past season, as game wardens had watched the meadows and arrested several marauders.

Mr. Leverett M. Loomis remarked upon the wholesale destruction of birds and their eggs on the California coast during 1895.

A new 'Committee on Protection of North American Birds' was appointed, as follows: William Dutcher (Chairman), Ruthven Deane, Witmer Stone, Leverett M. Loomis, and Geo. H. Mackay.



A. Horn & Co. Lithocautic, Baltimore

FLORIDA BURROWING OWL.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XIII.

APRIL, 1896.

NO. 2.

ON THE FLORIDA GROUND OWL (*SPEOTYTO FLORIDANA*).

BY WILLIAM PALMER.

Plate II.

UNIQUE, even among the many unfamiliar birds that a northern visitor sees in Florida, it is not strange that this bird should be always known, wherever it is found, by the distinctive appellation that I have used above and not by the usual *book* name of Burrowing Owl.

The habitat of the species lies some distance off the usual course of tourist travel, and to visit their haunts one has to tramp many miles over otherwise very uninviting prairie; thus few visitors to Florida have ever seen the birds, and even among the residents very little information can be obtained regarding its distribution and habits.

The Ground Owl is found in varying degrees of abundance throughout the central prairie portion of the southern half of the State, from Lake Kissimmee southward through the Kissimmee Valley. Westward its range extends as far as the prairies allow, even in the southwestern portion, to the vicinity of salt water. In some localities they are quite common, while elsewhere,

where the conditions are apparently similar, few or none can be found.

Of the bird but little concerning its habits has been written; few naturalists having had the opportunity of seeing it alive, and then only for a very limited time. Mr. S. N. Rhoads,¹ Mr. W. E. D. Scott,² and Mr. Walter Hoxie³ are the only writers who have recorded any extended experience with the species. Some additional information is also given by Major Bendire.⁴

During March of last year, in company with Mr. Robert Ridgway and Mr. E. J. Brown, I collected a series of these owls from about the central part of the western bank of Lake Kissimmee and on both sides of the Kissimmee River in Polk and Osceola Counties to near Fort Kissimmee in De Soto County. No eggs were found, our last date for collecting the birds — March 20 — showing several burrows nearly finished.

Upon comparing the papers of Messrs. Rhoads and Scott various contradictions and agreements regarding their observations of the local habitats and habits of these birds will be noticed. They appear each to have found the birds in quite different situations, hence the differences between their observations. My own journey took me over both kinds of ground mentioned by these writers, and I am thus enabled to agree with both as to the correctness of their statements and to present something additional. Both writers, Mr. Rhoads especially, have given very interesting and perfectly correct descriptions of the peculiar topography of the region inhabited by these birds, and I shall content myself by adding but slightly to their accounts.

My first meeting with these birds was on the evening of February 26. While walking at dusk toward camp on the sand ridge bordering the shore of Lake Kissimmee, I noticed an owl standing near the mouth of a burrow placed about the center of the ridge *and less than thirty feet from the lake shore*. Almost at the same moment I saw another, its companion, flying low and alighting on

¹ Auk, Vol. IX, Jan., 1892.

² Auk, Vol. IX, July, 1892.

³ O. & O., Vol. XIV, 1889, p. 33.

⁴ Life Histories of N. Am. Birds, No. I, 1892, p. 400.

the short grass a little way out on the prairie. I secured both birds and they proved to be a pair. No others were seen at the time and there was only one burrow at the place. Shortly after daylight the next morning, I again visited the spot, and secured another pair which I surprised out of the *same burrow*. The female of this pair is a very dark bird in fine unworn and unfaded plumage, much darker than any of many specimens subsequently secured (No. 150, 150, U. S. N. M. Coll.). A few hundred yards up the same ridge and above our camp, Mr. Ridgway secured three pairs from about five burrows. All these burrows were placed at about the center of the highest and driest parts of the ridge and were within forty paces of the lake shore. The highest parts of the ridge were hardly four feet above the lake level.

Mr. Scott says¹: "The highest parts of the open prairie, away from the wooded 'islands,' the sloughs and ponds, seemed to be the places chosen by the birds for their burrows. I found none nearer than a quarter of a mile to any pond or slough." Again he says: "The situation of a burrow was always high, dry ground, and where there was some considerable growth of a kind of huckleberry." He thus found none in low wet places. Rhoads found all his burrows in entirely different situations; as he says,² "in the margins of flat, grass-grown sand, of varying width, between the swamp and the saw palmettoes, and extending indefinitely in the direction of the stream." I found burrows and secured birds in both kinds of places mentioned by these gentlemen.

The Kissimmee Valley region is used almost entirely as cattle ranges, and in order to decrease the abundance of dead grass and other undesirable vegetation, and at the same time to increase the possibility of a new growth of grass for the cattle, the cowboys frequently, as the wind allows, set fire to the prairies in many places. Thus during our entire visit we could always see fire or smoke at several points on the horizon. It thus naturally happens that when the sandy areas of the prairies are a little higher and thus drier than the surrounding parts, these frequent fires prevent almost entirely any vegetation from taking root on such places.

¹ Auk, Vol. IX, 1892, p. 217.

² *Ibid.*, p. 4.

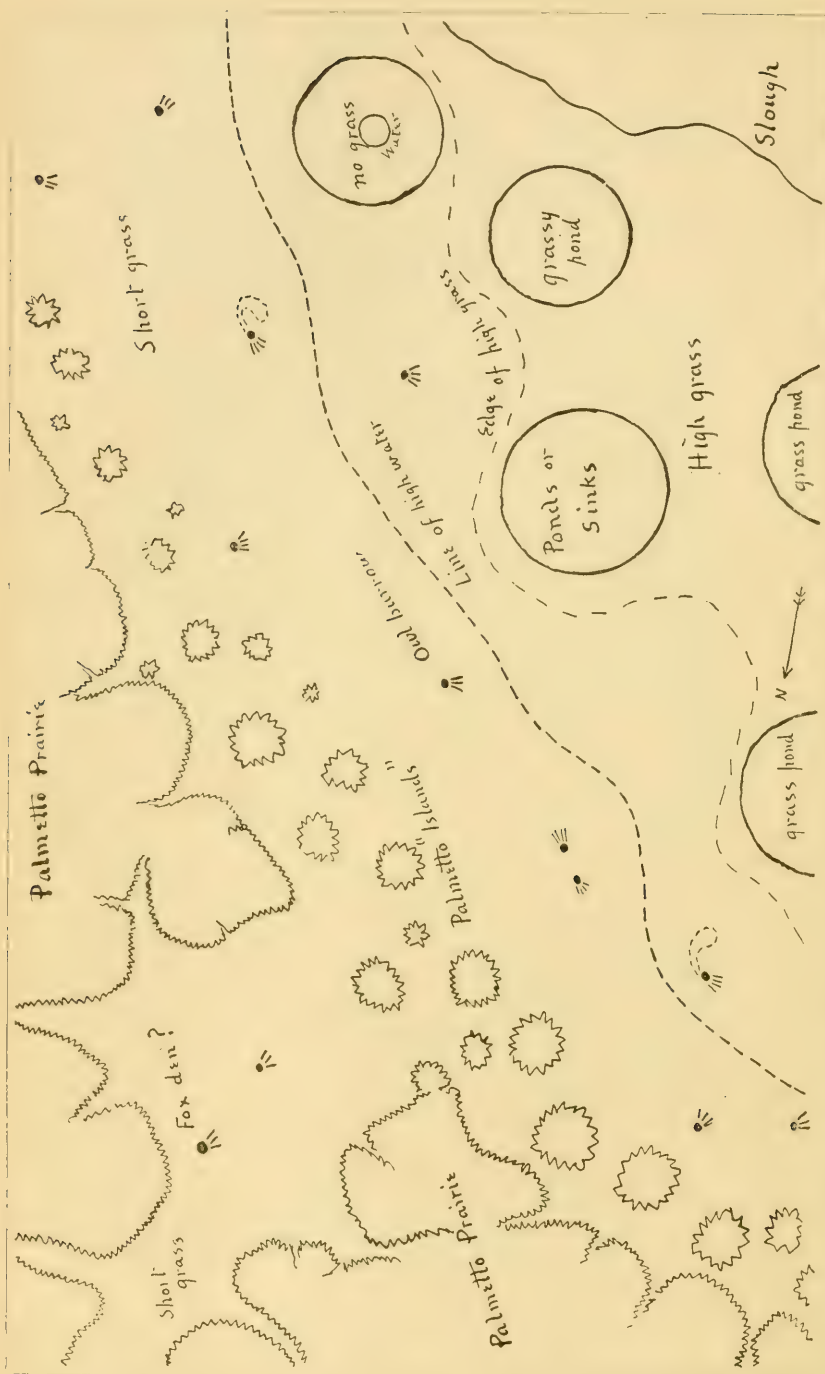


DIAGRAM SHOWING LOCATION OF A COLONY OF GROUND OWLS NEAR KISSIMMEE RIVER, FLORIDA.

These irregular patches of open sandy areas are found in various parts of the prairies but always on the higher ground, though I must confess that these last words seem out of place when describing a country where one can travel many miles without noticing a three foot rise of the ground. Such more elevated ground, when originally overgrown with saw palmettoes, are the usual burrowing places of foxes and skunks. The burning drives out these animals to more secluded quarters, and thus, as I believe, in time the Ground Owls take possession of their burrows. As the bareness of such places increases, other burrows are dug by the owls, thus accounting for the various shapes and sizes of these excavations. The strong odor of the mammals in some burrows from which I had just driven the owls, and their size as compared with burrows undoubtedly dug by the birds themselves convinced me of these facts. Within a few feet of some burrows was a shallower one but a foot or two deep, while about one I noticed a dozen or more shallow depressions, possibly the dusting places of Quails.

The commonest and I believe the original burrows of the Ground Owls are placed, as described by Mr. Rhoads, in the low, wet, grassy areas between the edges of the sloughs and ponds and the margins of the prairies. Such suitable breeding grounds extend for many miles, are rarely more than a few hundred yards wide, and follow the contour line of very high water. The diagram will show the character and general shape of these places. It is drawn from memory of a place near the Kissimmee River in Osceola County, where my friend Brown and myself secured eleven owls out of the burrows represented. On the left is an extensive prairie of scrub saw palmetto interspersed with open areas of grass and ponds with here and there at long intervals an 'island' or 'hammock' composed of two or more cabbage palmettoes, live oaks and gums separately or mixed, scattered or densely crowded, and sometimes growing in the water, but usually on a little elevation surrounded by a ring of water. At intervals through this prairie are the drier elevations before mentioned. At the edge of the prairie are many round 'islands' of saw palmettoes, from five to about fifty feet in diameter, and perhaps four to eight feet high. On the right, at a slightly lower level,

are many circular shallow ponds, usually a hundred or more feet in diameter, while beyond is the slough, extending irregularly parallel with the edge of the prairie.

Between the ponds and the palmetto 'islands' is the line of very high water, an almost flat sandy area densely carpeted with very short grass. About the center of this grassy area are the burrows of the owls, and here we found them in different stages of completion and at very irregular distances. At intervals offshoots of this grassy area extend irregularly into the prairie, and usually contain one or more burrows at or near their centers; in fact it is usual for the owls to locate at a spot about equidistant from the surrounding taller vegetation. In February these grassy flats are very wet, and many of them contain water, but as the water rapidly lowers by drainage and evaporation, the owls select a location and excavate in the wet sand. One place visited on March 4 contained water. On March 15, I secured a pair of birds from a new and unfinished burrow placed near the center and lowest part. The birds also undoubtedly re-use old burrows as was shown by the new deposits of sand on the old hills and through which grass was growing. That the owls dig out their own burrows here is very evident. Many examined on March 20 were in various stages of construction, some just begun, others fully excavated, while a few were finished, as was evidenced by the presence of pieces of dry cow droppings, grass roots and other rubbish in the tunnels and about the entrances of the burrows. Owing to their situation, the high water of the rainy season floods to some extent the sites of these burrows so that the owls are only able to inhabit the locality as the waters are receding. This flood line is shown by the debris of washed up grassy matter, and is indicated on the diagram. Thus at our visits the bottoms of the burrows were in very wet sand; indeed, owing to the flatness and the heavy dews, even the surface sand is very damp. As the season advances the burrows become drier and exactly suit the conditions necessary for the purposes of the birds. The rubbish carried into the excavation also tends to improve its habitable qualities. That the birds were pairing and seeking suitable breeding grounds during our visits is shown by the fact that several times when we secured one or both of the occupants of

a burrow, in a few days (in one case the same night) it was again reoccupied by a pair. Where the owls spend the time between the close of one breeding season and the beginning of another, I am unable to say. That they withdraw from their summer quarters is evident from the statements of people living in the vicinity.

Mr. Rhoads, in his paper cited before, says on page 6: "Every action of this species bespeaks a bird of eminently diurnal habits, but I have no reason to believe that they cannot range with equal freedom at night. From the nature of their food, however, I conclude they are more active in the daytime." Mr. Scott says also in his paper, page 218: "For I believe these birds to be strictly diurnal, doing most of their hunting, however, in the early morning and evening." As these gentlemen visited the haunts of these owls at the height of the breeding season, when many of the burrows contained young, the old owls were evidently forced by the demands of their numerous progeny to hunt in the daytime. In no instance did we find an owl away from the burrows except when frightened off by ourselves. Also I cannot agree with Mr. Rhoads that from the nature of their food they are more active in the daytime. All the stomachs examined contained remains of crayfish and beetles, which are certainly not animals whose season of activity is the daytime. In the tunnel of one burrow I found some feathers of a Savanna Sparrow. In the scratchings from the burrows, especially the old ones, minutely broken remains of crayfish were abundant, and in some cases we found about the mouths of the burrows what were certainly pellets, consisting of crayfish and beetle shells somewhat broken up. The nature of the material, containing no hair or feathers to bind it together, accounts for the rarity of pellets and for the abundance of the scattered remains in and about the tunnels.

Most writers mention that the male usually keeps watch at the mouth of the burrow and on the appearance of an intruder warns his mate with a low note of alarm. This was our invariable experience. My own observations convinced me that in every instance at the time of our visits to the owls (usually in the middle of the morning), the female was in the burrow while the male stood guard in the tunnel at the entrance. Upon slowly and quietly approaching a burrow, which could always be distinguished

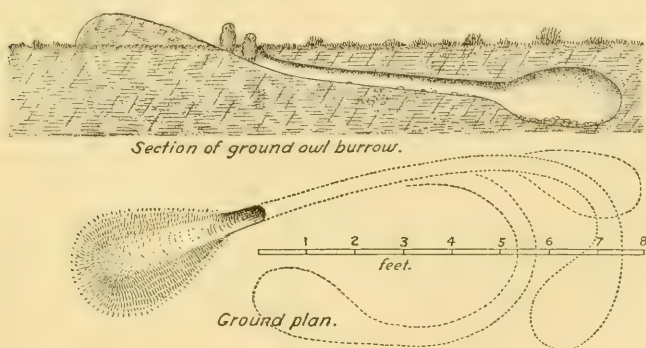
by the hillock of usually white sand at one side, the first seen of its occupants was the upper part of the head of one bird intently gazing in our direction. Upon a nearer approach a second head appeared at the burrow side of the first watcher while he moved up a little higher. Getting nearer they would move up more and more, when suddenly the first one, the male, would fly off for perhaps thirty yards. The female would remain a little longer and would sometimes run out of the tunnel and take a position facing us on the opposite side. If we remained stationary both birds would continue together, watching us intently as long as we stood unmoved, but it was always the first watcher that showed the most discretion by putting distance between himself and us upon our closer approach. In whichever direction they alighted they would instantly turn and, facing us, bow with the utmost gravity once or several times, as has been well told by Mr. Rhoads in his paper. If followed and flushed they usually returned to the burrow or some other, but rarely re-entered them unless wounded. In one instance a bird seeing the struggles of its mate flew directly into the burrow and disappeared, but an hour afterwards was found again on watch. A few of the male birds becoming alarmed would fly off into the palmettoes and hide, hence we collected more female than male birds. We saw no birds at work; possibly the female excavates the burrow while the male removes the accumulation of sand to the hillock. I doubt if any work is done while the sun is high.

That the males watch all day in the tunnels is perhaps shown by a comparison of the plumage of the sexes. Laying my series of skins in two rows, backs up, each row containing but one sex, it is noticeable at once that the females are much darker than the males (sepia brown¹) and show extremely little buffy color on the back and wings. The males, on the contrary, are lighter colored (olive with a very slight yellow wash¹). A few of the darker males approach the paler females in tint, but the darker wings and breast markings of the females readily serve to distinguish the sexes. Several specimens collected by Mr. Brown are quite blackish, but this was evidently caused by the birds having sought

¹ Ridgway's. Nomenclature of Colors.

out beetles, etc., in the newly burnt prairie. Nearly all of the males and but few females show wearing of the outer edges of the secondaries and tips of the primaries and also of the wing-coverts. This wearing of the feathers is evidently caused by abrasion with the sides of the tunnel, and as the male spends most of his time during the day within the narrow limits of the tunnel, and perhaps has frequent cause for moving, it is but reasonable to suppose that his plumage should be more abraded, which is found to be the case upon comparing our specimens. This habit of the males of standing guard in the tunnels undoubtedly results in a bleaching of the plumage. The darkest and finest plumaged birds that we collected are all females, while the lightest colored and most worn and dingy specimens are all males.

There is some difference between the statements of Messrs. Scott and Rhoads regarding the direction in which the burrows open. Those found by us had no regular direction, but more perhaps opened to the westward than to any other point, which was perhaps due to the ground sloping slightly that way. In the diagram (p. 102) the location of a colony of owls is shown by the



burrows being marked as a black spot, the lines radiating on one side representing the direction in which the scratched out materials have been piled. In a few I have indicated the shape and direction of the burrow as examined by us. The distance from the first to the last burrow, as shown on the diagram, is about half a mile. Nearly all the burrows were occupied by a pair of birds, and were in various stages of completion, though none

contained eggs. The birds had evidently selected such a situation not only for ease of digging, but also for ease of observation against their natural enemies, skunks, rattlesnakes and such like. All burrows found except one had no vegetation except short grass immediately about the tunnel. This exception had on one side several tall, thin clumps of bunch grass. The burrows represented in the diagram may, in a sense, be said to form a community, though by using this expression I do not intend to convey any idea that these owls are really gregarious. Usually a community or colony contains about three to six burrows, and generally they are from thirty to over one hundred yards apart, though occasionally two will be found about fifteen or twenty feet from each other. Occasionally, also, a burrow will be seen at a considerable distance from any other, and again, many miles may intervene between colonies; in short, the birds seem to require peculiar conditions of environment, as indicated above, and also to have in slight degree some gregarious feeling, which leads them to locate with their fellows if there is adequate room.

A comparison of the color of the feet of thirteen specimens, all collected at the same place and at the same time, presents considerable contrast. In about half of them the feet and lower portion of the tarsi were uniformly dark and but slightly paler beneath. The remainder showed a variety of changes from one which had the feet and lower third of the tarsi a dullish lemon yellow to the other extreme in which the yellow was confined to the soles. As this color is evanescent it does not show in dried specimens.

My use of a binomial name for this bird requires perhaps some explanation. A comparison of about sixty specimens of *floridana* with an equal number of *hypogæa* shows them to be distinct. As the habitat of the Florida bird does not approach that of *hypogæa* nearer than about eight hundred miles, and is also separated from its relatives in the West Indies and South America by vast areas of water, and as intergrading forms are unknown, I see no good reason why *floridana* should not rank as a species.

Again, as the use of a trinomial implies direct relationship with the specific form, through known intermediate and intergrading specimens, which certainly do not exist in this case, I can see no reason why *floridana* should be made a subspecies of the South American *cunicularia*.

THE TAXONOMIC VALUE OF THE TONGUE IN BIRDS.

BY FREDERIC A. LUCAS.

A RECENT paper of mine on the tongues of Woodpeckers concluded with the statement that "altogether the evidence favors the view that (external) modifications of the tongue are directly related to the character of the food, and are not of value for classification." Dr. Allen, in noticing this paper in 'The Auk' for October, 1895, says: "Granting that the facts are as stated, we are reluctant to agree with Mr. Lucas's conclusions, for on the same grounds we should have to rule out of the list of taxonomic characters any structural feature adaptively modified to special modes of life, and these involve, in a more or less marked degree, every part of the organism."

In writing thus, Dr. Allen has drawn attention to what is perhaps the greatest of the many difficulties which beset the ambitious taxonomist who would venture upon the classification of birds, since, as Dr. Allen says, every part of a bird's organism, whether external or internal, bears marks of modification for some purpose.

Consequently it is practically impossible to use in classification those characters alone which are due to morphological variations, but it is a truism that those characters which rest on a good morphologic basis should have precedence over those which are solely due to adaptation to some particular purpose. Now it is by no means easy to certainly discriminate between these two things for a physiological adaptation may be of such long standing as to have taken on the guise of structural modification. Thus the absence of a keel to the sternum, the openness of the angle formed by the scapula and coracoid, and the fusion of these last two bones are all secondary characters, and yet they have been accorded a high, if not the highest, rank in classification.

To illustrate the extent to which adaptive features may obscure the relationships of a bird, it may be worth while, for the benefit of the younger readers of 'The Auk,' to recall that on the evidence of the tibia Owen put *Cnemidornis* with the Moas, while Parker, guided by the sternum, assigned it a place near the Rails. Each of these eminent anatomists was led astray by purely adaptive

characters, the development of the legs of this great goose being due to its terrestrial habits, while the abandonment of flight had led to the degeneration of the shoulder girdle and the consequent cutting away and smoothing down of its various prominences, causing an appearance of relationship where none existed.

If habit can thus influence the deeper and more substantial parts of the body, it is only natural to expect that more superficial, softer structures would yield still more readily to external influences and adapt themselves to the requirements of daily life. Among such parts is the tongue, which in the majority of birds is so intimately concerned either in the getting of food or in its subsequent manipulation. Just here it will perhaps be best, in sporting parlance, 'to hedge' a little and to say that I have made only a beginning, and a small one at that, in the study of the tongue of birds, and that I am quite ready to retract my statements in the face of better evidence. At the same time the testimony so far is so completely on one side that it does not seem probable that evidence in rebuttal will be forthcoming. Let it be recalled, too, that it was the *external* modifications of the tongue which were considered to be due to adaptations to food or feeding. As for the hyoid, its modifications, slight though they are, appear to be partly adaptive and partly morphological. For example, while the tongues of Woodpeckers vary immensely in length, and in the extent and character of their barbs and horny papillæ, their underlying hyoids agree in the fusion of the cerato-hyals, the complete absence of a basi-branchial, and the fact that the basi-hyal does not extend to the cerato-branchials¹ which abut squarely upon it. This last might appear a good morphological character were it not apparent that this mode of attaching the cerato-branchials to the basi-hyal is the best possible in a tongue which is used as a spear or probe. And yet we find the same condition in the short tongue of the Rhea, and it is hard to see the adaptation in this case. Also there are many birds, obviously not closely related, whose hyoids are similar, so that we are forced to the conclusion that the value of the hyoid for classification is not very great, and that it must be used with caution.

¹ "These be hard words, my masters," but unavoidable.

Coming finally to the tongue¹ we would expect, if my conclusion were correct, to find a pretty constant relation between the shape of the tongue and the nature of the food, to find the same general style of tongue in birds belonging to different groups but eating the same kind of food, and, conversely, to find that birds undeniably closely related might have quite different tongues.

The simplest tongues are naturally found in those birds which use them least. In the big-throated Pelicans and Cormorants which bolt their food whole, they are rudimentary, while in fish-eating or flesh-eating birds, they are quite simple. The various groups of Ducks which differ as to their diet possess corresponding differences in the pattern of their tongues. The Canada Goose has a rather simple, flattened tongue, slightly barbed along the edge, while the fish-eating Red-breasted Merganser has the serrations on its slender beak matched by a series of sharp, reverted, horny barbs on the slender tongue, whose obvious purpose is to help in holding and swallowing slippery prey. The Teal and other species of more varied diet, which eat a multiplicity of little things, such as seeds, snails and worms, have a thick, fleshy tongue with several series of slender projections of various degrees of fineness, serving the double purpose of a rake and a sieve. The Honey-eaters have tubular and truly suctorial tongues, formed by the upturning of the edges until they lap, being so closely pressed together that it is a difficult matter to part them. The Meliphagidæ, the Drepanididæ and members of the genus *Cæreba* (formerly *Certhiola*) have a brushy tongue which probably serves to collect pollen, nectar and small insects from the bottom of flowers, and the flower-frequenting Parrots of the genus *Trichoglossus* also have a brushy tongue. In the Ducks then we have a variation in the tongue keeping pace with a variation in the bill of fare, while in the brush-tongued birds just noted we have a similarity of tongue correlated with similarity of food or method of obtaining it. A still better instance of similarity of tongues in widely separated birds, and one in which

¹ I would like here to express my indebtedness to my friend, Mr. William Palmer, for his kindness in supplying me not only with much material, but information on many points regarding the food and habits of birds.

there seems to be no call for any special adaptation, is that shown by the Swifts and Swallows. Structurally these birds are very dissimilar¹; the pterylosis, skeleton, muscles and digestive tract of each group has its own distinctive features, and yet their tongues are almost identical, as a glance at the figures (p. 114), where the tongues speak for themselves, will show. More than this, the only Trogon's tongue I have examined is also much like that of the Swallows,² and those of *Sayornis* and *Ampelis* are not far removed, so that were birds classified by their tongues all these would be placed near one another. Surely the similarity of all these can scarcely be due to kinship.

On the other hand, the species of the genus *Melospiza* exhibit very considerable differences in their tongues, that of Lincoln's Sparrow being perfectly plain and that of the Song Sparrow the most elaborately fimbriated I have yet met with among thick-tongued birds. The tongue of the Swamp Sparrow is intermediate between the two, though most resembling that of the Song Sparrow. Two specimens of *Melospiza georgiana* are shown, the simpler being from a fresh specimen with a much worn tongue, the other from an alcoholic with a very perfect tongue, and the difference between them is striking, though probably entirely due to wear. I hardly venture the suggestion that the covering of the tongue is regularly moulted, although such may be the case, but it is certainly subject to great changes caused by use. The Woodpeckers have been treated at some length elsewhere, and it is only necessary to repeat that among them the relation between food and tongue seems obvious.

¹ I do not know whether or not Dr. Sharpe is quite serious when he expresses a wish that some competent anatomist would point out the differences between the Swifts and Swallows, but although I might hesitate to call myself a "competent anatomist," I can readily point out these differences, and would do so most willingly.

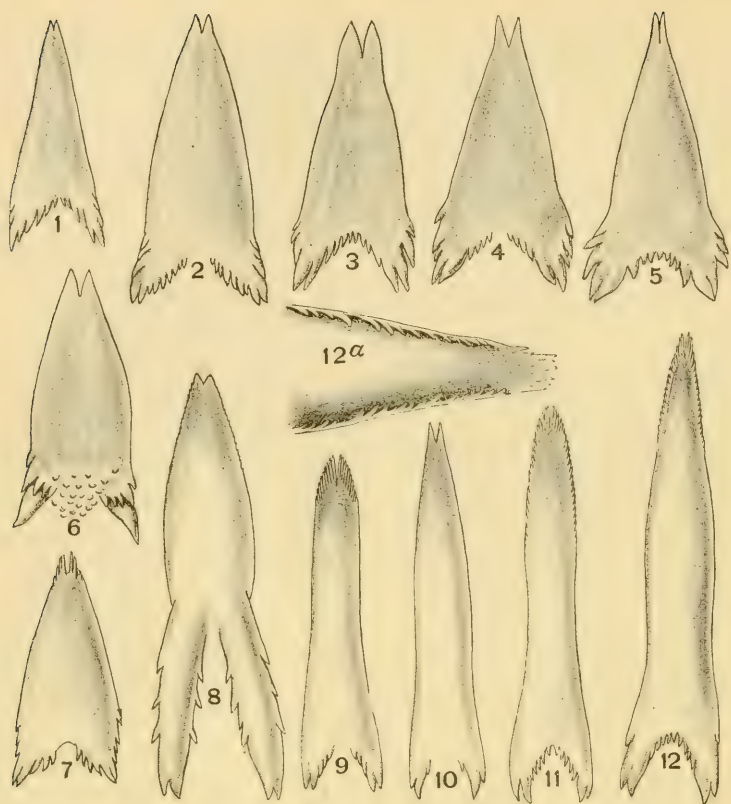
² It would be unfair not to point out that there is a decided difference between the tongue of *Priotelus* and that of the others figured. What may be called the primary lateral barbs of *Priotelus* are single, while in the other birds they are double; moreover, in *Priotelus* the primary barbs are overlaid by a second series of smaller barbs, while in the Swifts and Swallows all barbs start from the same level.

All Hummingbirds examined by me, or those whose tongues have been described by others, have identically the same style of tongue, and the members of this wonderfully homogeneous group, so far as I am aware, feed on the same kind of food and take it in the same manner. If any Hummingbird is known to depart widely from his brethren in the character of his food or method of taking it, I venture to say that his tongue will also be found to have some peculiarity.

The facts herein noted are few in number and our knowledge of the tongues and food of birds is far from complete, but, to sum up, what conclusions do we seem justified in drawing from the evidence so far advanced?

If we were to be guided by the tongues as they are found in our North American Woodpeckers, we might say that while they are clearly modified according to food or habits, yet they have a certain taxonomic value, since, in spite of their varied adaptations, it is still possible to recognize each and every one as the tongue of a Woodpecker. If, on the other hand, we based our conclusions on the Swifts and Swallows we would be justified in saying that the tongue is of no value since birds belonging to totally different orders may have precisely the same kind of tongue. Noting the differences that exist between the tongues of *Spinus tristis*, *Passer domesticus*, *Loxia*, *Habia*, and *Melospiza*, we would be forced to conclude that the tongue gives no hint even of family affinities, while a study of *Melospiza* would cast doubts even on its generic value.

But if we find that differences in the tongues of closely related birds are correlated with differences of food, and that birds widely separated by structure, but of similar habits, have similar tongues, and if we find that many tongues of peculiar form seem to bear a direct relation to the nature of the food, I think we are warranted in concluding that the evidence favors the view that modifications of the tongue are directly related to the character of the food and are not of value for classification.



EXPLANATION OF FIGURES.

1. *Macropteryx coronata*.
2. *Collocalia* sp.
3. *Tachycineta bicolor*.
4. *Tachornis gracilis*.
5. *Hirundo puella*.
6. *Priotelus temnurus*.
7. *Ampelis cedrorum*.

8. *Passer domesticus*.
9. *Melospiza georgiana*.
10. *Melospiza lincolni*.
11. *Melospiza georgiana*.
12. *Melospiza fasciata*.
- 12 a. *Melospiza fasciata*. Tip of tongue much enlarged.

These figures have been drawn with the camera lucida, all being enlarged to about the same absolute size to facilitate comparison.

[Reference having been made by Mr. Lucas to some remarks of mine on the subject here under discussion, I trust he will pardon me for adding a few words to his excellent paper on the taxonomic value of birds'

tongues, in which he has set forth the subject with great fairness and excellent judgment, and with whose conclusions I fully agree. It seems, however, pertinent to call attention to the fact that what is true of the tongue is equally true of many other parts of the avian structure, as the bill, the feet, the wings, the tail, the sternum, the principal bones of the limbs, various internal organs, etc. In some cases the bill, the foot, or the sternum, as in the case of the tongue of a Woodpecker, would suffice for the reference of the owner to its proper order, or family, or even genus, while in other cases such parts, when isolated from the rest of the bird, would give no certain indication of its affinities. Particularly is this true of the bill, which, like the tongue, is so intimately concerned with the nature of the food and the manner of its procurement. Indeed, in the case especially of conirostral and dentirostral birds, one might easily be in doubt as to any one of half a dozen quite distinct groups, as witness the old genera *Muscicapa*, *Turdus*, *Fringilla*, *Emberiza*, *Sylvia*, etc., under which species of entirely different families were combined until long after the close of the Linnæan period.

All this simply goes to emphasize again the well-known fact that no single organ, or even a single set of characters, osteological or otherwise, can be taken as the basis of a system of classification, or even be relied on to furnish sure evidence of relationship, unless within narrow limits. Probably Mr. Lucas could quite as easily show that the taxonomic value of almost any other organ was nearly if not quite as small, when taken by itself, as that of the tongue.—J. A. ALLEN.]

NOTES ON SOME OF THE BIRDS OF SOUTHERN CALIFORNIA.

BY FLORENCE A. MERRIAM.

THE following notes were made during the spring migration and nesting seasons of 1889 and 1894, at Twin Oaks, San Diego County, California. Twin Oaks is the post-office for the scattered ranches of a small valley at the foot of the Granite Mountains, one of the coast ranges. It is forty miles north of San Diego, and twelve miles from the Pacific. As the surrounding country is mainly treeless, its fauna is restricted, but this valley has a

natural system of irrigation in numerous side cañons that ditch down the spring rains from the hills, and as a result has a rich growth of sycamores and live oaks along the lines of the spring streams, with water near enough the surface to feed the vineyards, orchards and eucalyptus groves, and the grain and alfalfa fields that cover its floor. Moreover, the enclosing hills and the uncultivated parts of the valley are overgrown with chaparral, which offers a cover for many species that would not live out in the open; so that the valley not only affords a rich food supply to a great number of individual birds, but its vegetation is sufficiently varied to attract an unusual number of species for such a small section, in the arid west.

The orchards, eucalyptus groves, grain and alfalfa fields have largely been planted within the last six years, and must exert an important influence upon the future valley fauna. But unless the economic value of the birds is soon demonstrated and understood there is danger that the ranchmen, moved by the too obvious harm the birds do the fruit, may check the incomers or actually exterminate the more obtrusive species.

Callipepla californica vallicola. VALLEY QUAIL.—In 1889, Quail were so numerous that the dust of the roads was printed with their tracks, and it was an every-day matter to have them start out of the brush and run ahead of the horses quite unconcernedly, pattering along in their stiff, prim way, with their top knots thrown forward over their beaks. In fact the Quail were so abundant as to be a pest. For several years great flocks of them came down the cañons to Major Merriam's vineyard, where they destroyed annually from twenty to thirty tons of fruit. In one season, July to October, 1881, one hundred and thirty dozen were trapped on his ranch. The result of this wholesale destruction was manifest when I returned to the valley in 1894. The birds were then rarely seen on the roads, and seldom flushed in riding about the valley.

Carthartes aura. TURKEY VULTURE.—MR. W. W. Merriam watched two of the Buzzards eating skunks. They began by pulling the skin from the head and ate till they came to the scent gland, which was left on the ground.

Falco sparverius deserticolus. DESERT SPARROW HAWK.—March 30, 1889, a Sparrow Hawk was feeding its mate at the nest. The mouth of the nest was so small that it was difficult for the brooding bird to get in or out. It would fly against the hole and attempt to hook its bill over the edge to pull itself in, but its shoulders were too broad for the space and the only way it succeeded was by raising its claw to clasp the edge of

the hole, by that means laboriously drawing up its body and wedging itself through. June 2, 1894, I found young Sparrow Hawks nearly ready to fly.

Strix pratincola. AMERICAN BARN OWL.—April 5, 1889, I found one nesting in the charred hollow of a sycamore limb. Edwin Merriam told me that he had known the birds to change places on the nest in the daytime, and both birds to stay in the hole. They seemed to fly into any dark hole they could find to protect them during the day. A number were found in a partially covered well in the valley, and three were taken from a wind-mill tank in the neighborhood in about a month. In a mine at Escondido a number were found sitting in a crevice where the earth had caved, and about a dozen more at the bottom of the mine shaft, fifty to a hundred feet underground.

Bubo virginianus subarcticus. WESTERN HORNED OWL.—Found a nest with young, April 9, 1889. Saw another brooding, April 23, 1894.

Speotyto cunicularia hypogæa. BURROWING OWL.—The Owls, besides using ground squirrel holes, built in old badger holes in the red lands of the San Marcos grant. I once saw nine sitting around one burrow.

Geococcyx californianus. ROAD-RUNNER.—In May, 1894, I found a nest in a eucalyptus grove, about seven feet from the ground. It was partly lined with horse manure, which I was told the birds often used in their nests in the vicinity. The Road-runner is so protectively colored that when crossing a bare field it does not attract the eye, but when it stops and raises its long neck and tail, it looks like two sticks in the meadow.

Melanerpes formicivorus bairdi. CALIFORNIA WOODPECKER.—May 12, 1894, I found a pair of the Woodpeckers nesting. June 16 I heard the weak voices of young. July 6 the old Woodpeckers were found dead and I had the young taken from the nest, apparently just about ready to fly. The old birds were very shy at the nest, but at their hunting ground, nearly half a mile away, where they went to get food for the young, they were indifferent to spectators. They perched on a sycamore limb and made sallies over the alfalfa or out in the air. They also hunted from the posts of the wire fence. They seemed to light indifferently on top of the posts or against their sides, and I often saw them perch on a horizontal limb of the sycamore. They seemed more like Flycatchers than Woodpeckers, they spent so much time on the wing catching insects. In general habits they closely resemble our eastern *Melanerpes erythrocephalus*. Their cries and calls are almost identical.

Edwin Merriam told me that the Woodpeckers excavate nests a foot and a half to two feet deep, often making several elbows, changing the angle to the excavation to follow the soft wood. He said the birds seem to prefer the white oak for building, as for storing acorns; and use the same hole year after year, for the outer shell of the white oak—unlike the live oak—is very durable. The century plant grows wild on the ridges of the hills near the San Luis Rey mission, and he has found the

Woodpeckers filling their stalks with acorns, from six to fifteen feet up. As there were no oaks within five miles, the tall stalks of the agaves were the most convenient storehouses for the birds. In the Julien Mountains he found the pines and the dead deciduous oaks girdled with holes. The Flickers at one time made holes in the thin walls of a neighbor's honey house, and the Woodpeckers used the holes for their acorns. Mr. Merriam was at work in the house one day when they came, and the acorns dropped on the bench by his side. Dozens were also lying on the floor.

Colaptes cafer. RED-SHAFTED FLICKER. — April 8 and 18, 1889, I found Flickers excavating nests in sycamores. June 20, 1894, a pair were brooding in a charred hollow of a small oak. One of the sycamore nests was in the under side of a branch that slanted at an angle of forty-five degrees. The Flicker hung with claws planted in the hole, and with its tail braced at an angle under it, leaned forward to excavate. Using its feet as a pivot, it gradually swung in farther and farther; and when it had gone so far that it had to reach back to throw out its chips, it swung in and out on its feet like an automatic toy wound up for the performance. When it had been building for a week, only the tip of its tail protruded from the nest hole as it worked.

One September Mr. Merriam found Flickers storing acorns in the Julien Mountains. He says they often tried several holes before they found one that the nut would fit.

Trochilus alexandri. BLACK-CHINNED HUMMINGBIRD. — March 23, 1889, I found a nest in an oak with nearly fledged young. April 2, 1889, found a Hummingbird building in a sycamore, about ten feet from the ground. April 29, 1889, found one building near the tip of a hanging oak branch, about five feet from the ground. April 3, 1894, found nearly grown young in an oak nest fifteen feet above the ground. April 28, 1894, found a Hummingbird feeding young—just hatched—in a nest three to four feet high. May 17, 1894, found one brooding in an oak fifteen to twenty feet from the ground. May 22, 1894, found a nest just begun in an oak four to five feet from the ground. May 26, 1894, found a bird brooding on a nest in a eucalyptus grove, six or seven feet up. June 2, 1894, found a nest being built at the end of an oak spray three to four feet from the ground. June 20, 1894, found a Hummingbird feeding young out of the nest in a eucalyptus grove. The oak nests were in low, hanging, drooping branches or in oak tops. They were made of yellow, spongy down from the under side of sycamore leaves, and when built among green oak leaves had flakes of light green lichen on the outside. The eucalyptus nests did not have the lichen. One of them was fastened on the curve of a drooping branch, and to make it set true was deepened on the lower side so that it measured an inch and three quarters.

The peculiar feature of the building was the quivering motion of the bird in moulding. When the material was placed she moulded the nest like a potter, twirling tremulously around against the sides, sometimes

pressing so hard she ruffled up the feathers of her breast. She shaped the cup as if it were a piece of clay. To round the outside she would sit on the rim and lean over, smoothing the sides with her bill, often with the same tremulous motion. When she wanted to turn around in the nest she lifted herself by whirring her wings.

May 24, 1894, I saw a female Hummingbird sit on an oak twig, while a male, with the sound and regularity of a spindle in a machine, swung back and forth in an arc less than a yard long. He never turned around, but threw himself back at the end of the line by a quick spread of the tail.

May 19, 1894, I saw two different males go through a similar performance, though I could not discover the females. They flew backwards and sidewise, not turning around. They dove with gorgets puffed out and tails spread, making a loud whirring sound. April 26, 1889, while riding along the chaparral, I stopped a few moments and a Hummingbird shot down at my horse, darted up in the air and shot down again about a dozen times. It stopped itself in going up by suddenly closing its wings, then it turned around, opened its wings and darted down, "all sound." When hovering around oak trunks and feeding from flowers, I have seen the birds throw themselves up by giving a toss with their tails.

Selasphorus rufus. RUFOUS HUMMINGBIRD.—In April, when the wild gooseberry bushes are in bloom, they are fairly alive with the Rufous Hummingbirds, who find food in the red tubular blossoms. The whizzing and whirring lead you to the bushes from a distance and as you approach, the birds dart out, shoot up into the sky, sweep down and, pell mell, chase after each other through the air. The Rufous Hummingbirds must have been migrants at Twin Oaks, for they disappeared entirely.

Tyrannus vociferans. CASSIN'S KINGBIRD.—April 28, 1889, I found a Flycatcher's nest in a sycamore. The birds also built in the oaks near the house, making a bulky untidy nest, with string dangling from its sides. May 30, 1894, a pair were still building in a sycamore. Mr. Merriam told me that when he was plowing and the Blackbirds were following him, two or three of the 'Beebirds,' as he called them, would take up positions on stakes overlooking the flock; and when one of the Blackbirds got a worm that he could not gulp right down, a Beebird would dart after him and fight for it, chasing the Blackbird till he got it away. For the time the Flycatchers regularly made their living off the Blackbirds as the Eagles do from the Fish Hawks.

Myiarchus cinerascens. ASH-THROATED FLYCATCHER.—Seen in the chaparral and in the orchards hunting low for insects. Their calls closely resemble those of the eastern Great-crest, *M. crinitus*. Some are like *quir' r' r*, *quirp'* and *quir' r-rhea'*. The bird also says *hip'*, *hipl'*, *ha-wheel'*, the *hip* emphasized with a vertical flip of the tail, the *wheel*, with a side-wise dash. The Flycatcher has besides a low call of *hip* and *ha-whip*. Mr. Merriam told me that the birds nest in old Woodpecker holes, and line their nests with hair.

Sayornis nigricans. BLACK PHÆBE.—April 30, 1889, I found three eggs in the nest of a Black Phæbe five feet down in a deserted well. Before the eggs hatched, a pump was put down the well and water pumped up every day, but the birds did not desert the nest. In 1894 a pair of Phæbes built inside a whitewashed lath chicken house. The nest, made of large pellets of mud like a Swallow's, was plastered against a board in the peak of the chicken house.

Contopus richardsonii. WESTERN WOOD PEWEE.—June 29, 1894, a Wood Pewee was brooding in a small oak, having moved from its first attempted nest in the top of a high oak, probably driven away by Blue Jays.

Aphelocoma californica. CALIFORNIA JAY.—The flight of these Jays is often undulating. Mr. Merriam told me that he had frequently seen them carrying acorns. One year they took them from the oaks by the house to a side cañon half or three-quarters of a mile distant. Forty or fifty of them were at work, straggling along a few at a time, all day long for a period of a week or more. Sometimes they had two acorns in their bills. In Moosa Cañon the Jays carried the nuts from the bottom of the cañon to the sides of the hills above; and at another place, near Ocean-side, they carried them four miles, from the oaks of the valley to the chaparral of a mesa.

Xanthocephalus xanthocephalus. YELLOW-HEADED BLACKBIRD.—I saw large flocks of them on the mustard seven miles west of the valley, and found one in the vineyard with Brewer's Blackbirds and Redwings.

Icterus cucullatus nelsoni. ARIZONA HOODED ORIOLE.—April 23, 1889, a pair were building in an oak beside a ranch-house. They made their entire nest of the orange-colored parasitic vine, the dodder of the meadows.

Scolecophagus cyanocephalus. BREWER'S BLACKBIRD.—They usually began building about March 25. They nested familiarly in the oaks beside a house and also in sycamores. When the vineyard was being cultivated, all the Blackbirds of the valley, both Brewer's and Redwings, assembled to follow the plow.

Mr. Merriam told me that he had seen flocks of perhaps five hundred Blackbirds, of both species, fly down and light upon the backs of a band of grazing sheep. At such times a few of the birds would pick out wool for their nests, bracing themselves on the backs of the sheep and pulling where the wool had been loosened by the scab. He had also seen the birds ride hogs, horses and cattle, but he said the horses usually switched them off.

Carpodacus mexicanus frontalis. HOUSE FINCH.—The commonest bird in the valley, building about the houses more familiarly than Robins.

Chondestes grammacus strigatus. LARK SPARROW.—Seen frequently in the orchards. Its song resembles that of the Song Sparrow, but is richer and has a purring quality that characterizes it. Saw one carrying building materials, April 9, 1889.

Habia melanocephala. BLACK-HEADED GROSBEAK.—The Grosbeak has a marked habit of song flight. At its best, with the exception of the

Thrush, his song excels that of any bird I have ever heard. It is singular in its exquisite finish, and remarkable for its rich musical quality. It is a long song, greatly varied. It begins with the ordinary Grosbeak swinging pendulum phrase which is followed by a soft low measure, after which the pendulum and the low phrase are repeated. Then come a series of thrills precluding the most beautiful part of the song—a clear tender whistle, each note of which is drawn out so slowly and is so liquid and well rounded that it seems as if the bird were consciously perfecting it. Sometimes after this the Grosbeak, with a grace note, goes on to a final low trill and whistle: and then, after a momentary pause, begins all over again.

Passerina amœna. LAZULI BUNTING.—April 30, 1894, I found a pair building in the mallows. May 12, the female was brooding. May 29, the male was feeding the young. May 30 the nest was empty. June, 1894, I found a Lazuli's nest, made largely of oat stalks, in a tree in a eucalyptus grove, a great contrast to the gray nest in the weeds out in the fields.

Petrochelidon lunifrons. CLIFF SWALLOW.—Saw a large number of them getting mud from a temporary pond early in April, 1889.

Lanius ludovicianus excubitorides. WHITE-RUMPED SHRIKE.—April 10, 1889, there was one egg in a nest made in a clump of willows. June 1, 1894, a pair were feeding young in a nest made in a ball of mistletoe in the top of an oak. June 16, I found a family of young being fed in the chaparral.

Helminthophila celata lutescens. LUTESCENT WARBLER.—A very quiet minute workman, hunting among the golden tassels of the oaks with whose color it harmonizes perfectly. It will lean over the tip of an oak bough to examine a tassel, stretch up to reach a blossom hanging over its head, hop along a twig, and then flit up to cling head down to a spray of leaves, or flutter like a Hummingbird under a yellow tassel.

Dendroica auduboni. AUDUBON'S WARBLER.—One of the most abundant birds in March. It is as restless and active as the eastern *D. coronata*.

Harporhynchus redivivus. CALIFORNIA THRASHER.—April 29, 1889, I found a family of young, three quarters grown. In song and general habits the Thrasher is much like our eastern *H. rufus*. The bird uses its curved bill most skilfully. Instead of scratching with its feet as the Chewinks and Sparrows do, it uses its bill almost exclusively. I once watched one hunt for food. It cleared a space by scraping the leaves away, moving its bill through them rapidly from side to side. Then it made two holes in the earth, probing deep with its long bill, and after taking what it could get from the second hole returned to examine the first one as if to see if anything had come to the surface there.

Thryothorus bewickii spilurus. VIGORS'S WREN.—April 18, 1889, a pair of these Wrens had young in an old nose bag hanging on a peg in a shed. April 23 a Linnet's nest with one egg was in the nose bag on top of the dead nestling Wrens.

Troglodytes aëdon aztecus. WESTERN HOUSE WREN.—April, 1889, I found a number of nests in sycamore holes and about buildings. One was in a grape crate, and twigs were strewn loosely over one end of the box, covering a space nearly sixteen inches square. The compact high body of the nest measured eight by ten inches, and came so near the top of the crate that the birds could just creep in under the slats. Some of the twigs were ten inches long. April 28, 1894, I found a pair of Wrens carrying twigs to a sycamore hole. June 4 the young were being fed rapidly; but the birds did not leave the nest till June 16. Both the old birds had a striking habit of moving their wings tremulously at their sides, and sometimes the male, when singing to his mate, would raise his quivering wings till they almost met over his back.

Parus inornatus. PLAIN TITMOUSE.—March 24, 1889, I found a pair building; on May 12, they were feeding the young in the nest. June 15, 1894, I saw a pair feeding young out of the nest. The nests I found were in the crack of an oak, about four feet from the ground, and in the under side of a decayed branch, fifteen or twenty feet above the ground. When hunting, the birds flattened their high crests to small points at the back of the head.

Chamæa fasciata henshawi. WREN-TIT.—April 3, 1889, I saw two Wren-tits carrying material, but could not find their nest. June 8, 1894, I saw a family of young in the brush. The birds live in the cover of the chaparral. Their long tails tilt up and down as they fly, and sometimes rise over their backs when they light. In looking for food the Wren-tits often hold their tails up and hunt in the careful way of the Wrens. Their scold, which is a loud chatter, is also wrennish in character.

The song is the most striking thing about the Wren-tit. From it the people of the valley call him the 'scale bird.' He is not seen unless you go to the brush to look for him, but wherever you are you will hear the clear ringing voice running down the scale, the bell-like tones now coming from the chaparral of the valley, now from the bowlder-strewn hillsides above. The Wren-tit seems timid about singing in sight and it was a long time before I connected the quiet obscure bird with the loud beautiful voice. But one day when watching a Wren-tit it puffed up its throat till its feathers stood out in layers, and brought out the slow distinct notes of the descending scale, its tail shaking with each note.

Although the general character of the song remains the same, it varies somewhat in the notes and their relative rapidity. I have heard the whole song given on one note, the first four uttered very slowly, the last four faster, but a commoner form has nine notes, the last five running down the scale. At times the first four notes are given alone, as *keep, keep, keep, keep*; at others, as two syllables, *keep'-it, keep'-it, keep'-it*—three repetitions of the same note. A common form is a scale of seven two-syllabled notes—*tip'-it, tip'-it, tip'-it, tip'-it, tip'-it, tip'-it, tip'-it*. Again one hears a combination of the one and two-syllabled notes, the first four on one

note, the rest going down the scale, as *keep, keep, keep, keep, keep'-it, keep'-it, keep'-it*. There is also a rapid run with a rolled *r*.

The Wren-tits are hard birds to study because it is so difficult to penetrate the brush where they live; but one gets occasional glimpses of them outside. I once saw one break up a Gnatcatcher's nest in an oak on the edge of the chaparral, and afterwards came on one that was persistently feeding the fledgling of a Lazuli Bunting, although both parent birds were on the spot.

***Psaltriparus minimus californicus*.** CALIFORNIA BUSH-TIT.—In March and April, 1889, and April, 1894, I found a number of the birds building. One of the nests I was watching pulled down of its own weight, closing in the entrance. Its wall, made of fine gray moss and oak blossoms, was half an inch to an inch thick, and had a wadding of feathers inside. I counted three hundred, and there were a great many more. There must have been several dozen chicken feathers, each from two to three inches in length. The builders profited by experience in an interesting way. Their second nest, to begin with, was not nearly so long as the first one, although that may have been from the additional labor the extra length would entail. They hung the nest between the forks of a twig whose cross twig could support the top. At first they put the entrance about half an inch below this supporting cross twig, but afterwards moved it up above the twig so that the roof could not possibly close the hole as it had done in the first nest. This time the hole itself, which was usually the girth of the bird, was made much larger than in the old nest. The birds used the materials of the deserted nest to make the new one. In building, they began at the top of the open pocket—at the cross twig—leaving the roof till the last, though they made the first entrance while the lower part of the nest merely hung in loose fibres—was not formed at all. In making the body of the pocket they would light on the cross twig and swing themselves down inside, hanging by their claws while they placed their material and moulded and shaped the pocket from the inside. When the nest was completed it had a quantity of brown oak tassels around the entrance, which was finished neatly with lichen.

The Bush-tits are rapid workers. I found a nest begun one day, only a filmy spot in the leaves, and the next day it had grown to be a gray bag over eight inches long, though I could still see daylight through it. The birds work together and give their fine call of *schrüt, schrüt*, as they go and come about the nest. Their long tails give them a long tilting flight. The Bush-tits are very abundant at Twin Oaks. I have often found two of their nests in one oak. In 1889 I found eight nests in oaks, from seven to fifteen feet from the ground, but none in 'low bushes.' Mr. Merriam told me that out of dozens of nests, he had found only one in a bush. He thought the live oak nests averaged from eight to nine feet from the ground. He said the birds often weighted the nests with sand and sometimes built a projecting roof over the entrance.

***Polioptila cærulea obscura*.** WESTERN GNATCATCHER.—April 29,

1889, I found a nest in a small oak, containing two eggs. May 4, 1894, I found a pair brooding. May 16, a pair were building in an oak, fifteen to twenty feet above the ground. May 28, the birds seemed to be through building and were flitting about warbling and apparently taking a rest before time to begin brooding. May 31, after a Blue Jay had created an excitement in the oak, the Gnatcatchers began taking their nest to pieces, and went to work putting it up in a low oak a few rods away. June 7 the birds were still building. June 11 they were brooding, changing places in the nest. June 25 the young were being fed. July 4 the young were out, being fed in the brush. From May 16, or more accurately May 14—for the nest had been begun at least two days before I found it—from May 14 to July 4, those birds were working to get one brood launched. The first nest took them two weeks, the second one about ten days. Their method of work was interesting. The nest was laid on a horizontal branch. Their plan seemed to be twofold, to make the walls compact and strong by using only fine bits of material and packing them tightly together—drilling them in—and at the same time to give the walls form and keep them trim and shipshape by moulding inside and smoothing the rim and the outside. Sometimes the builder would smooth the brim with its neck and bill like a Redstart, as a person sharpens a knife on a whetstone, a stroke one way and then a stroke the other. The birds usually got inside to work, but there was a twig beside the nest that served for scaffolding, and they sometimes stood on that to work on the outside. They both worked, flying rapidly back and forth with material. The second nest rested lightly on a horizontal limb, but was supported mainly by two twigs which forked so as to enclose it. It was a beautiful nest, covered with lichen and lined with feathers. The birds were not at all shy. They let me come so near that I saw the black lines bordering the blue forehead of the male.

Sialia mexicana occidentalis. WESTERN BLUEBIRD.—Mr. Merriam told me he had seen the Bluebirds build in the mud nests of Swallows in trees; but most frequently in knot holes and in the abandoned nests of the small Woodpeckers.

THE LAW WHICH UNDERLIES PROTECTIVE COLORATION.

BY ABBOTT H. THAYER.

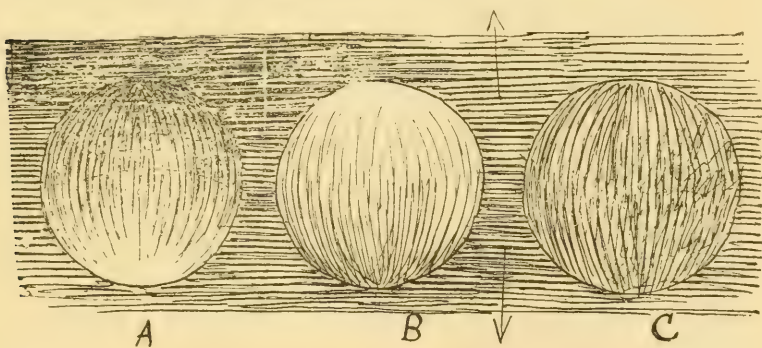
THIS article is intended to set forth a beautiful law of nature which, so far as I can discover, has never been pointed out in print. It is the law of gradation in the coloring of animals, and

is responsible for most of the phenomena of protective coloration except those properly called mimicry.

Naturalists have long recognized the fact that the coloring of many animals makes them difficult to distinguish, and have called the whole phenomenon protective coloration, little guessing how wonderful a fact lay hidden under the name.

Mimicry makes an animal appear to be some other thing, whereas this newly discovered law makes him cease to appear to exist at all. The following are some examples of true mimicry. The Screech Owl, when startled, makes himself tall and slim, and with eyes shut to a narrow line simulates a dead stub of the tree on which he sits. Certain Herons stretch their necks straight upward, and with head and green beak pointed at the zenith, pass themselves off for blades of sedge grass. Certain harmless snakes spread their heads out flat, in imitation of their poisonous cousins, and rattle with their tails in the leaves. Many butterflies have stone or bark-colored under sides to their wings, which make them look like a bit of bark or lichen when they sit still on a stone or tree trunk with wings shut over their backs.

The newly discovered law may be stated thus: Animals are painted by nature, darkest on those parts which tend to be most lighted by the sky's light, and *vice versa*.



The accompanying diagram illustrates this statement. Animals are colored by nature as in A, the sky lights them as in B, and the two effects cancel each other, as in C. The result is that their gradation of light and shade, by which opaque solid

objects manifest themselves to the eye, is effaced *at every point*, the cancellation being as complete at one point as another, as in Fig. C of the diagram, and the spectator seems to see right through the space really occupied by an opaque animal.

Fig. 1 of a Ruffed Grouse shows this arrangement of color and light. This bird belongs to the class in which the arrangement is found in its simplest form, the color making a complete gradation from brown above to silvery white beneath, and conforming to every slightest modelling; for instance, it grows light under the shelving eyebrow, and darker again on the projecting cheek.

When he stands alive on the ground, as in Fig. 2, his obliteration by the effect of the top light is obvious.

Writers say "he is so nearly like the color of his surroundings that you cannot see him." Fig. 3 is to show that they ascribe the concealment to the wrong cause. I merely took the bird shown in Fig. 2, and accurately tinted his under parts with brown to match his back, and in less degree tinted his sides, till I had reduced him to uniformity of color all over; but I did not, of course, change his upper surfaces at all. In short, I extended his 'protective' colors all over him.

Now observe the effect on replacing him in a life-like position. He is completely unmasked. The reader has but to compare the distance at which he can distinguish a bird in No. 2 and in No. 3 respectively, to see whether simple 'protective coloration,' as ordinarily defined, is the true cause of this concealment, or whether this compound gradation of color and light is the true cause.

Fig. 4 and Fig. 5 show that his colors are powerless to conceal him in any position except the upright one which he holds when alive, and Figs. 6 and 7 do the same for the Woodcock.

In Figs. 5 and 6, notwithstanding the fact that we have even the strongest 'protective' colors towards us, the bird is by no means concealed.

The Woodcock series corresponds to that of the Ruffed Grouse. Fig. 8 shows a female on her nest, very difficult to find. In Fig. 9 the bird has been treated exactly as I treated the Ruffed Grouse in Fig. 3. Observe that she is essentially more conspicuous, though not a feather of her upper parts has been artificially painted.



FIG. 1. SIDE VIEW OF DEAD GROUSE TO SHOW COLOR GRADATION.



FIG. 2. GROUSE POSED ON THE GROUND AS IN LIFE.



FIG. 3. GROUSE POSED AS IN FIG. 2 BUT WITH COLOR GRADATION PAINTED OUT.



FIG. 4. GROUSE ON SIDE, EXPOSING BREAST.



FIG. 5. GROUSE ON SIDE, EXPOSING BACK.



FIG. 6. WOODCOCK ON SIDE, EXPOSING BACK.



FIG. 7. WOODCOCK ON SIDE, EXPOSING BREAST.

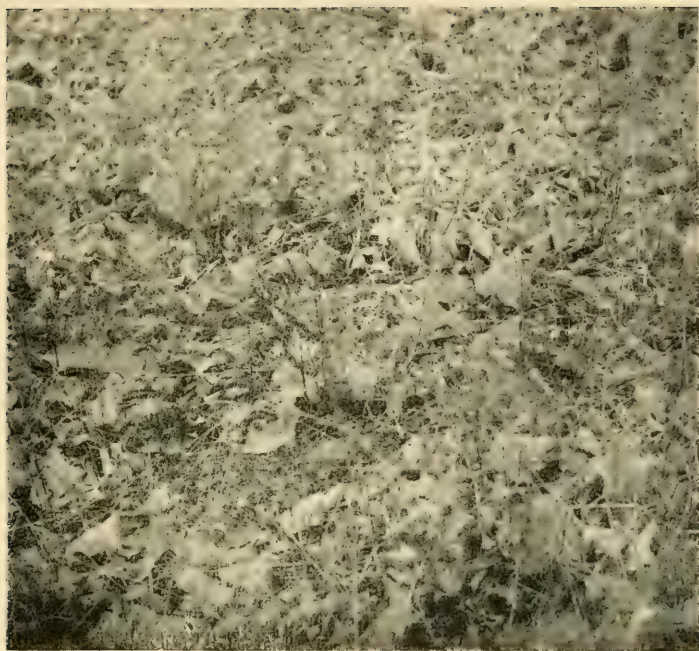


FIG. 8. WOODCOCK ON NEST.



FIG. 9. WOODCOCK ON NEST, COLOR GRADATION PAINTED OUT.

The reason of her visibility is that I have artificially extended her top colors down her sides, thereby destroying her counter-gradation and forcing her solidity to manifest itself.

The reader, I think, must try these experiments for himself before he can believe that in Fig. 3 and Fig. 9 I tinted the under surfaces exactly as dark as the upper, and no darker. But I beg him to look at any horizontal branch in the woods which is either on the level of his eye or below it. He will see that although it has exactly the color of its surroundings, it is not in the least concealed, because, being of uniform color above and below, like the birds after I had painted their under sides, it wears that universal attribute of a solid, namely, a gradation of shading from its light side to its dark side.

I leave to the reader the pleasure of discovering for himself that this principle of gradation in color is almost universal in the animal kingdom. In certain classes of birds and of flying insects, however, the principle gives place, more or less, to the device pointed out by Bates; namely, the employment of strong arbitrary patterns of color which tend to conceal the wearer by destroying his apparent continuity of surface. This makes, for instance, the Mallard's dark green head tend to detach itself from his body, and to join the dark green of the shady sedge; or the ruby of the Hummingbird to desert him and to appear to belong to the glistening flower which he is searching. Yet many other cases of color applied apparently at random conform essentially to the law stated above. The dark patches are on top, the light ones beneath.¹ The dark breast-mark, so widely used by nature on birds, usually has the effect of putting out a conspicuous and shining rotundity of some bright or light color, as in the Meadow-lark and the Flicker; because it comes just where the breast, in its usual position, rounds upward and faces the sky. The dark collars of the males of most species of Duck are absolute counter-shading to the light from the sky, when the birds sit in their characteristic positions. For most female Ducks

¹ I have proved, by experiments with painted decoys, that even brilliant top-colors, however strongly contrasted to surroundings, scarcely tend to betray the wearer, if his ensemble be a gradation from dark above to light below.

nature uses the complete gradation, like that of Grouse and Sandpipers. Ground birds in general, such as Grouse, Sandpipers and Sparrows, are usually clothed throughout in colors graded according to this principle. But the males of many species of Pheasant are notable exceptions to this last statement.

Now there is still one more very beautiful phenomenon to record. If the animal itself is obliterated by this mechanism of nature, for what useful purpose beyond considerations of sexual selections do his *markings* exist, since *they* are not obliterated? The answer is that the markings on the animal become a picture of such background as one might see if the animal were transparent. They help the animal to coalesce, in appearance, with the background which is visible when the observer looks past him. In many birds, for instance, those colors, which would be seen by an enemy looking down upon them, are laid on by nature in coarser and more blotchy patterns than are the colors on their sides, so that when you look down on them you see that their backs match the mottled ground about them; whereas, when you assume a lower point of view nearer their level, and see more and more of their sides, you find them painted to match the more intricate designs of the vegetation which is a little farther off, and which, from this new stand-point of the observer, now forms the background. In this latter position, the head of the animal, being the highest part of its body, is seen against the most distant part of the background, whose details are still more reduced by perspective. To correspond with this reduction of strength in the more distant background, the details on the sides of the animal's head are likewise reduced in their emphasis, and like the more distant details are smaller in pattern.

It is a most significant fact that throughout the animal kingdom the highest development of the arrangement of color and light described in this article, and the highest development of the habit of standing or crouching motionless in full daylight to avoid discovery, seem to coincide very closely. For instance, Gallinaeous birds, most Waders, and the Cat tribe have both the color arrangement and the standing or the crouching habit highly developed. Contrasted with these, for example, are the skunks

and the bears. Neither of these quadrupeds has the gradation of color, nor the standing or crouching habit. They are both nocturnal, and therefore do not need either gradation or crouching for concealment.

It is plain, then, that while nature undeniably completes the concealment of animals by pitching their whole color-gradation in a key to match their environment, the real magic lies in the gradation itself from darkest above to lightest below, wherever this gradation is found. This is why it is so hard to see the Partridge in the tree, the Sandpiper on the mud, or the tiger crouching in the jungle.

DESCRIPTIONS OF A NEW HORNED LARK AND A NEW SONG SPARROW, WITH REMARKS ON SENNETT'S NIGHTHAWK.

BY LOUIS B. BISHOP.

THE birds upon which this paper is based were collected by Mr. W. H. Hoyt and myself in Towner and Rolette Counties, North Dakota, during the spring and summer of 1895. Both counties belong to the prairie region, are practically treeless, cultivated only partially, and dotted with lakes and sloughs of varying extent. The Turtle Mountains, part of which lie in the northern part of Rolette County, and through which passes the Manitoba boundary, are utterly different in character. They consist of hills rising a few hundred feet above the rolling prairie, contain numberless small lakes and ponds, and are covered with a dense growth of deciduous trees.

My thanks are due to Mr. Hoyt for the use of his series of skins of the races described, and to Dr. Allen and Mr. Chapman of the American Museum of Natural History, and to Mr. Ridgway of the Smithsonian Institution, for the privilege of comparing my birds with the collections of the respective museums.

Otocoris alpestris hoyti. new subspecies. HOYT'S HORNED LARK.

Subspecific characters.—Similar to *Otocoris alpestris* but with the upper parts generally paler and more gray, the posterior auriculars gray rather than brown, and the yellow of the head and neck replaced by white, excepting the forehead, which is dirty yellowish-white, and the throat, which is distinctly yellow, most pronounced toward the center.

Type, ♂ ad. (No. 1447, collection of L. B. Bishop), Cando, Towner County, North Dakota, April 22, 1895; L. B. B.

Length, 7.35; wing, 4.54; tail, 3.01; bill from nostril, .41; tarsus, .89.

The adult female in spring plumage (No. 1529, collection of L. B. Bishop, Rock Lake, Towner County, North Dakota, May 1, 1895) differs in a similar manner from the female of *alpestris*, but in the female of *hoyti* the yellow on the throat is much paler than in the male.

Two forms of Horned Larks are common in Towner County, North Dakota, in April: a small, pale variety most nearly allied to *O. a. arenicola*, which is already breeding, and a larger, darker bird found in flocks with the Snowflakes and Lapland Longspurs, whose reproductive organs are only slightly enlarged. This latter bird disappears early in May, and is apparently heretofore undescribed. From *leucolæma* it may be separated by the darker upper parts and yellow throat, characters constant in all the specimens I have seen. The black of the malar region is broader than in skins of *alpestris*, but this difference may not always obtain. In size and color this form is intermediate between *alpestris* and *leucolæma*, or rather between *alpestris*, which bounds its probable breeding-range on the east, *praticola* on the southeast, *arenicola* on the southwest, and *leucolæma* on the west (*cf.* Dr. Dwight, Auk, VII, p. 144, line 14 et seq.). It can be distinguished from *arenicola* by its larger size and darker upper parts, and from *praticola* chiefly by its size, although in the latter the black markings of the jugulum and malar region are generally if not always more widely separated.

Ten adult males in breeding plumage from Towner County agree very closely with the type, differing only slightly in the intensity of the yellow on the throat, the purity of the white on the forehead, and the extent and prominence of the dark markings on the posterior part of the breast. One bird shows an

TABLE OF MEASUREMENTS OF *Otocoris alpestris hoyti*.

No. of Specimens.	Sex.	Locality.	Season.	Wing.			Tail.			Tarsus.			Bill from Nostril.		
				Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.
10	♂	North Dakota.	Spring.	4.35	4.54	4.22	2.98	3.08	2.93	.90	.92	.88	.40	.42	.37
2	♂	Depot Island.	Spring.	4.37	4.38	4.36	3.01	3.04	2.98	.90	.91	.89	.405	.41	.40
4	♂ ?	North Dakota.	Winter.	4.32	4.47	4.22	2.89	3.05	2.79	.89	.92	.86	.365	.38	.35
4	♀	North Dakota.	Spring.	4.06	4.13	4.01	2.70	2.85	2.62	.88	.89	.86	.38	.39	.37

approach to *alpestris* in a yellow tinge to the supraorbital line and auriculars. The dark centers of the scapulars and interscapulars are also slightly more conspicuous in some specimens than in others.

Two adult male Horned Larks in worn breeding plumage in my collection, said to have been taken by George Comer, at Depot Island, Hudson Strait, in May 1894, differ from the type of *hoyti* chiefly in having the yellow of the throat a trifle paler, and the posterior auriculars browner and slightly yellowish. They are much nearer this form than to *alpestris*, and probably mark its eastern limit.

Four Horned Larks (probably males) taken at Cando, February 13, 1891, for which I am indebted to Mr. E. T. Judd, differ from spring birds in the following particulars: the yellow of the throat is paler,—in one specimen hardly perceptible,—the gray tips of the feathers longer, quite concealing the white and black of the forehead, and partially the black crescent on the chest, and the scapulars and interscapulars browner with more conspicuous dark centers. These birds might possibly be referred to *leucolæma*, as has been done with similar specimens by Dr. Dwight (Auk, Vol. VII, p. 143), but I am inclined to consider them representatives of the winter plumage of *hoyti*, principally on account of their dark upper parts, and somewhat smaller size.

I am very glad to have the opportunity of naming this race in honor of my friend Mr. William H. Hoyt of Stamford, Connecticut.

***Melospiza fasciata juddi*, new subspecies. DAKOTA SONG SPARROW.**

Subspecific characters.—Similar to *Melospiza fasciata* but with the ground color of the upper parts paler, especially the superciliary streak and sides of neck, and the white of the lower parts clearer; the interscapulars with the black center broader, the reddish-brown portions narrower, and the gray edgings paler; the dark markings on the breast restricted, and more sharply defined against the ground color.

Type, ♂ ad. (No. 1674, collection of L. B. Bishop), Rock Lake, Towner County, North Dakota, May 11, 1895; L. B. B.

Length, 6.75; wing, 2.62; tail, 2.78; tarsus, .81; culmen, .51; bill from nostril, .36; depth of bill, .31.

A small series of Song Sparrows taken in Towner and Rolette Counties, North Dakota, during the spring and summer of 1895, may be separated from the eastern bird by the above characters. In general measurements, and in size and shape of the bill, this form is indistinguishable from *M. fasciata*, and shows no approach to *M. f. montana* in these respects, or in coloring. In general appearance it is characterized by a marked contrast between the light and dark portions of the plumage, most conspicuous in the interscapular region, while in *fasciata* the colors are more softly blended. From *samuelis* and *heermanni*—perhaps its nearest allies after *fasciata*—it can easily be distinguished by a much paler ground color and less intense dark markings. Song Sparrows in the collection of the American Museum of Natural History, taken near Fort Snelling, Minnesota, during the spring, are intermediate between the Dakota bird and that inhabiting the Atlantic coast, but more closely resemble the latter.

In habits the Dakota Song Sparrow resembles the eastern bird, living in the brush which grows along the banks of the 'coulées.' It arrives in Towner County the latter part of April, but is by no means common on the prairie. One or two pairs nested at Rock Lake on a small island, which was covered with a tangled growth of willows, hawthorns and rose-bushes. We found it, however, quite common during June and July in the Turtle Mountains, inhabiting both the brush of the clearings and the reed-grown margins of retired lakes. The song is quite different from that of *fasciata*, being clearer, sweeter and more powerful. The first one I heard singing I could not believe was a Song Sparrow until I had the bird in my hand.

Two nests were found in the Turtle Mountains: the first on June 14, containing three young, one egg, and one egg of the Cowbird. This nest was composed of grass, and completely concealed in some high, dry and matted grass, on the borders of a small and secluded lake. The other nest was taken by Mr. Hoyt on July 11, and, thanks to his kindness, three of the four eggs which it contained are now in my collection. This nest was similar to the other, and hidden in the high grass of a hay slough.

The eggs, which average .75 in. in length by .60 in. in breadth, show a tendency to a sub-pyriform outline—a shape certainly

unusual in *fasciata*: otherwise, with their greenish-white ground color and profuse markings of reddish-brown, they are indistinguishable from eggs of the latter.

I take pleasure in naming this form in honor of Mr. Elmer T. Judd of Cando, North Dakota, to whom the success of our trip was largely due.

Average measurements (with extremes) of ten specimens (6 ♂, 4 ♀): length, 6.54 (5.75–6.75); wing, 2.66 (2.49–2.81); tail, 2.78 (2.69–2.91); tarsus, .81 (.77–.87); culmen, .51 (.49–.55); bill from nostril, .35 (.32–.37); depth of bill, .30 (.28–.31).

Chordeiles virginianus sennetti. SENNETT'S NIGHTHAWK.

A series of ten adult male Nighthawks from Towner and Rolette Counties, N. D., serve at least as an argument in favor of the validity of this subspecies. All closely resemble the type specimen (No. 4927, collection of George B. Sennett), now in the American Museum of Natural History, and differ from each other only slightly in the amount of buff or ochraceous, which replaces the white irregularly in different portions of the plumage. In all buff replaces the white to some extent, but no one of this series could be mistaken for *henryi*. The general pallor of the plumage is the chief characteristic of these birds, and serves to distinguish them from *virginianus* at a glance.

Three females from the same locality taken in June and July — one of them a breeding bird taken with a typical male and two eggs — are similar but with the upper parts darker and the entire lower parts tinged with buff, which becomes ochraceous-buff on the throat. Two other female Nighthawks from the same region, one taken on June 11, and the other with two eggs on June 24, are quite different, the prevailing tint of the entire plumage, except the greater wing-coverts, wings and tail, being ochraceous-buff. These birds might readily be referred to *henryi*, but all the males taken or seen during the breeding season were unmistakably *sennetti*. Two males of *virginianus* were taken by Mr. Hoyt during the migration in the latter part of May, but none were seen during the breeding season.

Two downy young taken by Mr. John Schaler from the same nest at Rock Lake, on July 17, have an interrupted black bar across the breast, black at the base of the mandible, and the entire upper parts mottled with black, but while the ground color of one is pure white, that of the other is pale ochraceous-buff, becoming white only in the center of the abdomen. This difference may be one of sex, or, taken in connection with the ochraceous females mentioned, connect *sennetti* with *henryi*.

Wherever we went about the prairies we found this bird a rather common summer resident, especially in the neighborhood of water. It arrives the last week in May, and begins laying about the twentieth of June. The pale colors of the male protect him admirably, harmonizing with the dull gray of the fences and rocks, perched on which he passes the day, while the darker colors of the female render her less conspicuous when seated over her eggs on the black soil. Six eggs in my collection from Towner County average 1.67 in. in length by .88 in. in breadth, and are perhaps a trifle paler with somewhat smaller markings than eggs of *virginianus*.

Average measurement (with extremes) of thirteen specimens (10 ♂, 3 ♀): length, 9.53 (9.25-9.81); wing, 7.61 (7.08-7.87); tail, 4.68 (4.53-4.79).

AN APPARENTLY NEW *CHORDEILES* FROM COSTA RICA.

BY GEO. K. CHERRIE.

It is with much hesitation that I present the following as characterizing a new Nighthawk of the *C. virginianus* group,—that is, the species or subspecies in which the white wing-patch is posterior to the tips of the secondaries.

***Chordeiles virginianus aserriensis*,¹ subsp. nov.**

Type, No. 4261, collection Geo. K. Cherrie, San José, Costa Rica, Nov. 2, 1893. Smaller and much lighter colored (both above and below) than the true *virginianus*. Above, grayish predominating; decidedly dusky in center of back where feathers are mostly blackish basally, tipped and edged with grayish and crossed by irregular broken subterminal bands of the same color. Scapulars blackish basally, the edges with grayish mottlings and buffy blotches. Wing-coverts grayish, finely mottled with dusky. Below, upper breast grayish irregularly barred with narrow blackish bands. Lower breast, sides and flanks lightly buffy whitish regularly barred with blackish, the white and black bands being of about equal width. Center of abdomen immaculate white; under tail-coverts slightly buffy, the longer ones showing imperfect blackish bands.

Length (skin), 8.40; wing, 6.96; tail, 4.40.

This bird agrees with *C. v. chapmani* in size and in the white unmarked abdomen,² but differs greatly in color above, as it does from a large series of *virginianus* and from examples of *virginianus henryi* with which it has been compared.

The type is a male bird, but the tail does not show the broad white band near the tip found in the males of other species of *Chordeiles*, but has exactly the same tail as the females.

Whether this be constant or not, or whether in the male possessing a tail marked like that of the female it is a character of immaturity, I am not in a position to state with certainty. One of the specimens received for examination from the National Museum³ (No. 128,373, U. S. N. M., Escondido River, Nic., Oct. 28, 1892, Chas. W. Richmond) apparently pertains to this new race. It is a male and has the tail markings similar to those of the type. However, in this example the terminal white band on the third pair of rectrices, from the outside, is wider than on the other feathers. In this specimen the general color above is considerably darker than in the type, approaching much nearer to *C. virginianus* proper.

¹ From the valley of the River Aserri, San José, C. R.

² Comparison is made with the type of *chapmani*, recently acquired by the Field Museum as a donation from Prof. C. B. Cory.

³ I am indebted to the authorities of the Smithsonian Institution and to those of the American Museum of Natural History for the loan of specimens used in the preparation of this paper.

GÄTKE'S 'HELIGOLAND.'¹

BY J. A. ALLEN.

HERR GÄTKE'S 'Heligoland' is beyond question a remarkable book. Its author and the island from which it takes its name are both unique in the annals of ornithological literature. It is not therefore surprising that the work has been received with almost unexampled interest by bird lovers and bird students the world over. 'Heligoland' was originally published in German in 1892, and has now received the compliment of being made accessible to English readers.

Heligoland is a small island at the mouth of the Elbe in the North Sea, about fifteen miles distant from the mainland. It is triangular in outline, slightly over a mile in length, but much less than a square mile in area. Being treeless and almost destitute of shrubbery, it affords slight chance of concealment for the birds which visit it, often in enormous numbers. But its bird population is mainly transient, only one species of land bird, the ever-present House Sparrow, being a regular breeder in any numbers. The island is thus a resting place merely — 'Die Vogelwarte Helgoland,' to borrow the expressive German title of Herr Gätke's book — for migrants, that make it a temporary place of refuge in their long journeys, in most cases tarrying for only a few hours. It also lies at the intersection of two prominent lines of migration, the one a north and south route, the other an east and west route. Here Herr Gätke for fifty years, aided by fowlers, taxidermists, and bird catchers of all sorts, has kept an incessant watch upon the ever-fluctuating bird population of this "bare and rugged isle," with the result of chronicling as visitants to Heligoland not less than 398 species, including a large number of waifs and strays from distant and in some instances most unexpected quarters of the globe. As a result, as already said, Heligoland and Herr Gätke have long been famous in the annals of orni-

¹ Heligoland as an Ornithological Observatory, the Result of Fifty Years' Experience. By Heinrich Gätke. Translated by Rudolph Rosenstock. Edinburgh: David Douglas. 1895. 8vo, pp. xii, 599.

thology. Hence it is natural that his book of over 600 pages, giving a detailed record of his observations and experiences, and of his views on bird migration, its causes and methods, should be hailed with delight by a wide circle of ornithological readers. As Herr Gütke has been awarded honorary membership in all of the leading ornithological societies of the world, it is perhaps not strange that his utterances on the 'mysterious' problems of bird life should be accepted as little short of oracular, and his statements taken at nearly their face value, without special scrutiny or criticism, by a large majority of his readers.

Indeed, 'Heligoland' has been pronounced by an ornithologist of high standing to be "one of the most original, most remarkable, and most valuable books ever written about birds." That it is original and remarkable no one will deny; as to its value there is easily room for difference of opinion. Herr Gütke's observations, it may be well to remember, have been limited to an almost barren island of less than a square mile in extent, with conditions necessarily exceptional, but of such a character as to give highly favorable opportunities for the study of certain features of the migratory movements of birds. But the fact that the conditions are unusual, and the field extremely limited, renders it questionable whether or not the conclusions of a single observer based thereon should outweigh the sum of all other observations made elsewhere, and the inferences and hypotheses of hundreds of excellent observers who have investigated the subject in other lands. Yet if we take Herr Gütke at his own estimate, observations made outside of Heligoland are to be discredited as in some way faulty or erroneous, if they fail to agree with those of the Oracle of Heligoland. At least, as one of his admirers puts it, "the most conspicuous result of his insistence upon the facts in the case is rank iconoclasm. He smashes our idols right and left; he leaves us at the mercy of our fables, helpless for lack of gods to supplicate, for he sets up none of his own in their places" (Auk, XII, p. 343). In other words, on most points he takes issue with what may be termed the general consensus of opinion of ornithologists, affirming that they are wrong while he must be right, or else declaring that all previous opinions and hypotheses are not only without foundation, but the point at issue is a riddle

beyond the power of man to solve. Hence we are led to a rather close scrutiny of evidence and arguments so universally iconoclastic.

'Heligoland' is indeed a remarkable book, and an important contribution, from many points of view, to the literature of ornithology; but it contains much that is set forth as fact which on close examination proves to be mere conjecture. On many points which Herr Gütke treats with great positiveness his knowledge is obviously as limited as the little field which has been the scene of his life-long labors.

Herr Gütke's book consists of three parts, entitled respectively 'Migration of Birds' (pp. 3-148), 'Changes in the Color of the Plumage of Birds without Moulting' (pp. 149-164), and 'Account of the Birds observed in Heligoland' (pp. 165-588). Part I is divided into eleven chapters or sections, relating to as many phases of the general subject of bird migration. The first chapter treats of the 'Course of Migration generally in Heligoland,' and gives a history of bird movements at the island chronologically by months from January to December. In style of treatment it is not unlike accounts that have been given of many other localities by various local observers, being a sort of calendar of the bird year at Heligoland. Its special interest is therefore due to the peculiar nature and geographic position of the island in relation to the migration routes of birds, and the long period of observation on which the account is based.

Chapter II (pp. 24-45) treats of the 'Direction of Flight.' Here his observations and conclusions are quite at variance with those of most observers at other points. He scouts the idea of 'Zugstrassen,' or restricted lines of migration, or concentrated migration by favorite routes, and affirms that "the migratory movement is performed by a broad front," which corresponds to the breadth of the breeding area. He says, for example: "The view, much discussed in recent years, that migrants follow the direction of ocean coasts, the drainage area of rivers, or depressions of valleys as fixed routes of migration, can hardly be maintained. Too many facts are directly at variance with this assumption" (p. 24). In proof of his view he cites the east and west migration of many species which, breeding in northeastern

Asia, pass Heligoland, and later turn southward to reach their winter quarters in southwestern Europe, crossing in their westward autumnal journey, nearly at right angles, all the principal mountain chains and rivers of northern Asia and Europe. River valleys being "generally endowed with a very varied vegetation and a rich insect life" are consequently "welcomed by the majority of migrants as most desirable feeding-places," and they are hence used as halting stations for "rest, food, or water,"—which fact, Gätke claims, has given rise to the idea, in the minds of superficial observers, that the migrants here met with are following the courses of the streams.

Herr Gätke recognizes at Heligoland two distinct lines of autumnal migration,—one from east to west, and another, of equal importance, from north to south (p. 37). The spring migration, in the case of the east to west migrants, differs markedly from the autumnal movement, in that the spring journey is much more rapid and made along the shortest line between the winter quarters and the breeding stations, whereas in the fall migration it describes two sides of a triangle,—namely, from eastern Asia to the coast of central Europe and thence abruptly south to northern Africa. It is further affirmed that "birds perform the journey from their winter quarters to the breeding stations, if possible, in one uninterrupted flight." That such is not the case in North America is amply proven, were there no other evidence, by the data given in Cooke and Merriam's 'Bird Migration in the Mississippi Valley,' where the daily progress of some sixty species has been traced from the Gulf of Mexico to Canada and has been found to be only from about fifteen to thirty miles per day, according to the species, and whether the species is an early or a late migrant. This seems much better evidence than the avowed basis of Herr Gätke's assumption, namely, "observations made here [at Heligoland] incidentally during the capture of birds at night at the lighthouse" (p. 44).

Chapter III (pp. 46–62) is devoted to 'Altitude of the Migration Flight.' On this point, in speaking of "migration proper," or "those large, extensive movements" which on the one hand conduct our migrants from their breeding homes to or very near their winter quarters in one uninterrupted flight, "and on the other

hand, in spring, convey them in the opposite direction from their winter quarters to their breeding haunts,—the uninterrupted continuity of the flight being still more marked in this latter phase of the migratory phenomenon,”—he says: “Observations extending over many years have led me to the conclusion that, as long as migration proceeds under normal conditions, this elevation is, in the case of by far the larger number, so great as to be completely beyond the powers of human observation; while we must regard as disturbances and irregularities of the migration movement proper, due to meteorological influences, such portions of it as are brought within our notice” (p. 46). Apparently he would place the height of the migration flight as high as 15,000 to 30,000 feet, and brings forward evidence to show that some birds attain at will a height of even 35,000 to 40,000 feet. He might have brought much stronger evidence to support his conclusion than any he cites had he been more familiar with the literature of the subject, for the observations made repeatedly in this country with telescopes directed toward the disk of the full moon during migration nights, demonstrating the fact that birds reach an altitude of from one to three miles in their migratory flights, is not mentioned.¹ In this connection he dwells upon the fact that birds must be very differently constituted from man or any other warm-blooded creature to be able to sustain life in such rarefied air-strata and under the low temperature of such elevations. He also comments at length on the ability possessed by many birds to vary apparently the specific gravity of their bodies, as in the case of various diving birds, and as must also be the case with birds that rise to great altitudes in flight.

The main purpose of the high altitude of the migration flight, he believes, is that these high strata of the air offer, for the time being, the most favorable conditions for migration, and render the migrating hosts independent of the numerous meteorological disturbances that affect the lower regions of the atmosphere, but that also the rarefied air of the upper regions presents less resistance to their progress.

¹ See Scott and Allen, Bull. Nutt. Orn. Club, VI, 1881, pp. 97-100, 188; Chapman, Auk, V, 1888, pp. 37-39.

In Chapter IV (pp. 63-73) the 'Velocity of the Migration Flight' is considered. On this subject there is unfortunately very little positive information; hence the field is a tempting one for conjecture and inference, and Herr Gütke has not neglected to make use of it. The actual data bearing on the subject which he is able to cite does not by any means favor the high rate of speed he assigns to migrating birds; namely, 180 to 240 geographical miles per hour, not for a single hour but for many hours consecutively! The character of his proof of this proposition is fairly shown by the following. His crucial test, and the main basis of his assumption, is the spring migration of the Red-spotted Bluethroat (*Cyanecula suecica*), a bird which winters in Egypt and the neighboring countries and breeds mainly north of the 60th parallel in northern Europe. On the negative evidence that it has not been recorded as occurring anywhere in numbers in spring between the Nile Valley and Heligoland, it is assumed as beyond question that the majority of the individuals of this species, "under normal conditions, and in the absence of meteorological influences of a disturbing nature, accomplish their migration in one uninterrupted nocturnal flight, . . . thus accomplishing a distance of at least 1600 geographical miles within the space of nine hours" (pp. 65, 266), hence maintaining an average rate of speed of 180 miles an hour. The Bluethroat is cited as positive proof that other birds having the same winter quarters and breeding range must also migrate in the same way (p. 67). But he goes even further than this, citing as "the most striking and incontestable proof" of his assumption the American Golden Plover (*Charadrius dominicus*), which, he affirms, migrates in autumn from Labrador to northern Brazil in a single uninterrupted flight, over a distance of 3000 geographical miles. He says, "we may probably assume fifteen hours as the longest spell during which a bird is able to remain on the wing without taking sustenance of any kind"; and the velocity of flight of these birds would, on this assumption, "amount to 212 geographical miles per hour" (p. 69). Even this astonishing rapidity of flight he believes is not to be regarded as "either exceptional or isolated," and that the same birds "may be able to accomplish even greater feats during the spring migration." Indeed, recurring again to the Bluethroat, he believes that those

individuals which pass on from Africa to the Scandinavian peninsula, including the majority of the representatives of the species, "accomplish during the same May night a distance of 2000 to 2400 geographical miles. This would," he adds, "of course, give as a result a velocity of four miles a minute," or 240 miles an hour!

Whatever the Bluethroat may really do, the kind of migration ascribed to it is not that well known to characterize the majority of birds during the spring migration; indeed, Herr Gätke finds it necessary to explain away the observations of others, or to disregard such of their testimony as may be known to him, as of no special importance when weighed in the scale with his own "fifty years' experience" on the little island of Heligoland. Thus he says: "It has been supposed that birds are in the habit of breaking their migration journey without any very powerful disturbing cause both in autumn and spring, at the former season on reaching latitudes not so far south as those of their normal winter quarters, and in spring before they have arrived at their breeding stations. *With this assumption, however, my own experiences on this island, accumulated for many years, are at variance.*" This quotation, especially the portion here italicized, shows the attitude and spirit in which Gätke approaches the many general questions he discusses,—his own little island of a few acres in extent, nearly woodless and barren, and his own experiences limited thereto, being placed in opposition to the accumulated experience of thousands of observers scattered over the greater part of the earth.

It is quite possible that many birds, the Plovers among them, attain not unfrequently a speed of 100 to 150 miles per hour, and are able to maintain that rate for a number of consecutive hours, but that birds as a rule fly at this rate, or make the journey between their winter stations and breeding grounds "in one uninterrupted flight" is not by any means the rule, if indeed it be the case in any instance. To marshal the well-known proof of this would be almost to insult the intelligence of the experienced ornithologist. Let it suffice to say that where trustworthy observations have been made regarding the ordinary flight of Ducks, Pigeons, Hawks, and some other species, the rate of speed has been rarely found to exceed 35 to 60 miles per hour.

Again, in regard to the American Golden Plover, which he believes makes the journey from Labrador to northern Brazil "in one uninterrupted flight," it may be worth while to mention that this species is a well-known autumn migrant all along the Atlantic coast of the United States, and in the West Indies, during a period of from four to six weeks, varying in abundance, and in the length of stay of any particular flock, according to the weather, being common at numerous well-known points for from a few hours to a few days, in the case of heavy easterly storms, and rare during continued fair weather.¹ Because there is a record of flocks passing the Bermudas without stopping, it does not follow that these flocks may not afterwards have stopped at some of the many islands of the West Indies, or that flocks that pass the Massachusetts coast without stopping may not halt at points on the coast further south; for, as said above, the species is of frequent occurrence as an autumnal visitor all along the Atlantic coast from New England to Florida and in the West Indies.

Chapter V (pp. 74-99) considers the 'Meteorological Conditions which influence Migration,' as the force and direction of the winds, the state of the atmosphere as regards moisture, cloudiness, temperature, etc., all of these influences being intelligently discussed, and their effects illustrated by reference to the author's experiences at Heligoland.

In Chapter VI (pp. 100-113), on the 'Order of Migration according to Age and Sex,' the author's dogmatism and disregard of whatever occurs outside of Heligoland stands prominently forth. "The question," says Gätke, "as to the order of age and sex in which migrants take up their annual journeys is one on which, up to the most recent time, there have prevailed more serious errors than on any problem connected with the migration phenomenon. It was generally supposed that the old birds acted as the leaders, teachers, and guides of the young ones on their migrations; and although this view was not based on any observations whatsoever in Nature, it seemed so natural and reasonable that it was accepted in pure good faith, without subjecting it to

¹ See Mackay, Auk, VIII, 1891, pp. 17-24 — record of the autumn migration of this species in Massachusetts for thirty years. *Ibid.*, IX, 1892, p. 199; X, 1893, p. 79; XI, 1894, p. 75; XII, 1895, p. 78; XIII, 1896, pp. 89-92, *passim*.

the test of observation and experiment [p. 100]. . . . But this representation . . . is really nothing more than a plausibly sounding fable, in which — quite after the manner of a fable — the old and wise individuals represent the teachers and guides of simple youth: In reality, however, this explanation of the question not only lacks all support of actual facts, *but is entirely at variance with every observation hitherto made in Nature*" (p. 102). While there is perhaps a taint of the fabulous in the case as here put, if taken too literally — namely, that the young are led and guided by the old and experienced — it is difficult to understand the arrogance and dogmatism of the portion of the above extract here printed in italics, since numberless observers of the widest experience and utmost trustworthiness take the opposite view from Herr Gätke on this matter. While Gätke's experience may exceed that of most other observers as regards length of time, it is confined to a minute locality and to exceptional conditions, whereas the published evidence he so loftily declares not to exist is based on the experiences of observers whose field of research includes vast areas and more normal conditions.

Speaking of Heligoland, he thus summarizes the "incontestable result of all the numerous phenomena" there observed as follows: "1. That under normal conditions in the case of the 396 species occurring here, with the exception of a single one [the Cuckoo], the autumn migration is initiated by the young birds, from about six to eight weeks after leaving their nests. 2. That the parents of these young individuals do not follow till one or two months later. 3. That of these old birds again, the most handsome old males are the last to set out on the migratory journey. In spring this order is inverted" (p. 102).

This explicit statement that in the case of these 396 species (with the one exception noted), "the autumn migration is initiated by the young birds, from about six to eight weeks after leaving their nests," seems at first sight to carry great weight, and we naturally turn to Part III of the book to learn what these species are and their status as Heligoland birds. An examination of the list soon reveals the fact that over 200 of the 396 species must be classed as merely stragglers to Heligoland,¹ more than one half of

¹ See Coues, 'The Auk,' Vol. XII, 1895, pp. 322-346.

which have been detected in Heligoland only once each, in a period of fifty years, and half of the remainder but twice each! Furthermore that in many instances these records are spring records, the species having never been taken in Heligoland in autumn. A further examination of the list shows that not more than one-third of these 396 species are really in evidence as regards the autumnal migration. Notwithstanding this misleading statement as to the extent of the evidence, we cannot suppose that Gütke is mistaken in regard to the order of appearance of the old and young birds at Heligoland after the breeding season in the case of such familiar species as the Starling, the Wheatear, the Pied Flycatcher, the Whinchat, the Redstart, Willow Warbler, the Ortolan Bunting, etc., the young of which are reported as appearing in Heligoland from the last of June or early part of July onward till September, weeks in advance of the old birds. As these birds all breed commonly on the adjoining mainland, it is doubtful whether these early visits of young birds indicate anything more than local movements of young birds prior to the season of true migration. As only one land bird, the ubiquitous House Sparrow, breeds regularly in numbers on this little unfortified island, any visitors from the neighboring mainland after the breeding season appear to be entered in Mr. Gütke's list of fall migrants. Indeed it is evident that these young birds, only a few weeks from the nest, must be many of them still in nestling plumage, and hence unfitted to start on their regular autumnal migration.

The case, however, is different with the young Golden Plovers (*Charadrius plumialis*) recorded as arriving at Heligoland the first week in July, since the breeding grounds are more distant. It goes to show, however, that allied (congeneric) species of birds may behave very differently at different places, for it is a well established fact that on the eastern coast of North America the adult birds arrive first in the case of the American Golden Plover.¹ Also it is almost the uniform testimony of our best American observers that as a rule, among song birds as well as

¹ See especially Mackay, Auk, XIII, 1896, pp. 90-92; also Feilden, Ibis, 1889, p. 491.

shore birds, the adults precede the young in the autumnal migration.

In Chapter VII (pp. 114-130), under the head of 'Exceptional Migration Phenomena,' are grouped many facts of interest respecting the season and character of occurrence and sources of origin of the numerous waifs and strays, or chance visitors, which have been taken or observed on Heligoland.

Chapter VIII (pp. 131-142) is devoted to a consideration of the question 'What Guides Birds during their Migrations?' and Chapter IX (pp. 143-148) to 'The Cause of the Migratory Movement.' These are principally made up of destructive criticism of the theories and suggestions of previous writers, his conclusion being that the former question "presents to the savants of our day as great a riddle as it did to the first observer in ages before the dawn of history" (p. 132). He concludes Chapter VIII by saying: "Having thus examined the many various attempts made to explain the wonderful faculty possessed by migrants of discovering the right path of their migration, and shown how insufficient most of them are when confronted with actual facts, observed directly in nature, in the course of more than fifty years' investigations and at a spot so favoured as Heligoland, I cannot say that I feel encouraged to add further to the number of such attempts by others of my own" (p. 142). As he has during the previous chapters advanced theories of his own to explain the various phenomena of migration, usually in direct opposition to those of other students of the subject, and has not hesitated to reject as not worth considering observations made elsewhere if they do not tally with his "fifty years' investigations" on his "favoured little isle of Heligoland," it seems almost remarkable that he should content himself in the present case—after proving (to his own satisfaction) everybody else wrong—with this modest confession of inability to explain this old-time riddle. He discards the idea of definite routes of migration; of topographic features of the landscape,—coast lines, river courses, and mountain chains,—serving as landmarks; and discredits the possibility of a hereditary transmission of knowledge derived from experience. He erroneously assumes that because birds migrate principally by

night it is impossible for them to distinguish the nature of the country beneath them, and that hence if they were possessed of a highly developed local sense of direction it would be of no service to them on such journeys.

In regard to the "immediate cause of the departure of birds on their migrations," he believes "we are confronted with a riddle which has hitherto defied every attempt at a solution, and which indeed we may hardly expect will ever be likely to receive a final explanation. . . . In thus abstaining from setting forth new theories, I have been guided by the conviction, rendered firmer with increasing knowledge of the phenomena, that what at present has been ascertained in reference to the migration of birds furnishes us with no clue, by the aid of which we are enabled to penetrate the depths of this wondrous mystery" (p. 148).

In reality, great light has unquestionably been thrown upon the causes of migration, the manner of its performance, the conditions which influence it, and the factors that aid in guiding birds on their migrations, by the systematic observations so extensively carried on in Europe and in America, during especially the last ten or twelve years. Yet the love of mystery is so inherent in the popular mind, and the habit of viewing the migration of birds as the "mystery of mysteries" in bird life is so firmly fixed, that it is perhaps not strange that a reasonable explanation of all the principal phenomena of the subject should be received as unwelcome iconoclasm on the part of one who clings tenaciously to life-long modes of thought. The "several very ingenious and plausible hypotheses," resulting from "long and profound study," find no favor with Herr Gütke, though favorably received by the newer school of migration observers, who consider the subject as no longer invested in "impenetrable mystery."

In Part II (pp. 151-164) he takes up the subject of 'Changes in the Colour of the Plumage of Birds without Moulting,' in the discussion of which the author displays a depth of ignorance and a misapprehension of simple facts that ill comports with his claim of "having for many years devoted the most unremitting attention" to the subject. He evidently knows little about the way birds

moult, or he would not, as on page 110, consider it "singular how such a bird [as the Hooded Crow] could lose so many of the flight feathers of *both* wings" at the same time, or fail to recognize a spring moult in so many of the species he cites as changing to the breeding dress without any renewal of the plumage.

He says: "The change from the winter plumage to the breeding dress *without moulting* is accomplished in three different ways. The simplest of these consists in the shedding of the edges of the feathers of the winter plumage." This he correctly describes, citing numerous species in which it is exemplified,—a change well known to intelligent ornithologists the world over. The second method, he says, "consists, so far as I have been able to determine without the help of a microscope, in a peeling off of the separate barbs of the feathers, whereby these are stripped of a thin inconspicuously coloured envelope, so that the purer and finer colour previously concealed beneath the latter becomes exposed" (p. 152). In reality this is in part a less marked wearing off of the edges of the feathers mentioned under his first method of change, and in part a slight alteration of colour due to the exposure of the plumage to the influence of the elements. The "peeling" process is an original discovery of Herr Gütke, and doubtless exists largely, if not solely, in his fertile imagination.

"The last and most wonderful process in the colour changes of the plumage of birds, not attended by a renewal of the feathers themselves, consists in an actual, complete, and very striking change in the colour of the feathers, without such alteration being brought about, or even assisted, by any change in their texture. As illustrating the climax of this process," he continues, "we may probably point to the change from pure snow-white to an intense glossy black or blackish brown" (p. 153), as he avers occurs in the head and neck of the Little Gull and in the fore-neck and upper breast of the White and Pied Wagtails, and in the heads and necks of Guillemots and Auks. The manner of this change he describes with a minuteness that seems to bar all cavil at its correctness, were it not for the utter improbability of the case, and the known fact that in the same or allied American species this spring change from white to black is due to moult and a complete renewal of the plumage of the parts involved!

His remarks on the changes of colour in various species of

Limicolæ, and especially in the Sanderling and Golden Plover, is equally absurd and erroneous, although the changes are described with a minuteness of detail that would seem to imply a careful examination of specimens. In fact, he seems to have made such examinations, as he says his observations are based "on fresh examples, in which, by examination of the inner cutaneous surface, it was possible to determine with certainty whether moulting actually took place or not. . . . Where the change of colour proceeds by gradational stages in this manner, the bird under examination completely gives one the impression of being fully in the moulting state, and, in fact, examples of this kind have been sent me by ornithologists of repute in proof of a moulting process. A close and exact examination, however, at once reveals the fact that all these scattered and newly coloured feathers are of perfectly normal size; nor do we find among them any others of half or more than half their full growth, still within the dermal quill [sheath], as would be the case if one were dealing with a moulting individual" (p. 163). On this point it must be said that Gätke was very unfortunate in selecting his material, or very careless in his observations; as ordinarily it is by no means difficult to find in such specimens as he describes plenty of feathers in all stages of growth. How he could have failed to discover them is hard to conceive. His interpretation of the markings and changes he so minutely describes must be due to so strong a preconceived notion of what ought to occur that he was blinded to the real facts in the case. Indeed, according to Gätke, in speaking of the Sanderling, not only does the color of the feathers change but "at the same time the serrated indentations [due to wear] of the worn posterior flight feathers, the abraded tips of the barbs which formed the light lateral markings" are restored. "When this [transformation] is complete, the feathers are of a dusky black colour, the large triangular spots at their margins nearly white, the serrated indentations of the edges of the feathers are filled out, and the whole plumage has the appearance as if it had just been renewed by moulting," — which, in fact, is just what has happened! ¹

¹ In this connection see 'The Changes of Plumage in the Dunlin and Sanderling,' by Frank M. Chapman (Bull. Am. Mus. Nat. Hist., VIII, 1896, pp. 1-8), written with special reference to Gätke's remarkable statements.

If his statements are true, not only does an old, long-worn feather receive an influx of pigment, but has its worn and ragged edges restored by the addition of new growths to the edges,—“a restoration of the worn and blunted barbs to their previous entirety.” In other words, we must suppose that a feather after months of wear is capable of rejuvenation to the extent of not only developing a system of circulation for the transmission of pigment through the shaft and out into the ultimate divisions of the barbs, but also solid matter for the restoration of the structural parts of the feather which have been worn away by abrasion! Thus, in speaking of the Spotted Redshank, the Marsh and Wood Sandpipers, he says the light triangular spots on the margins of the flight feathers and larger feathers of the upper parts “are so little able to stand wear, that by the end of the winter they have almost or entirely disappeared, as a result of which the remaining portions of the feathers have acquired jagged edges something like the cutting edge of a saw. It is this edge which, in the course of the colour changes, is restored” (p. 157).

That such statements can be made seriously by any intelligent ornithologist, and still more be quoted with approval by prominent authorities on bird matters (see *Auk*, XII, p. 346, and *Ibis*, Jan., 1896, p. 142), is almost beyond belief. In short, it would be hard to find a greater amount of error in an equal space than is crowded into Herr Gätke's fifteen pages on ‘Change in Colour of the Plumage of Birds without Moulting,’ or more astonishingly absurd statements.¹

If this is the result of “the most unremitting attention for many years” to this subject at Heligoland, which “supplies us with an abundance of material for observation,” we may perhaps reasonably feel a little distrust of some of Herr Gätke's observations and conclusions based on “fifty years of investigation” at

¹ It may be added here that this chapter was published in substance by Herr Gätke in 1854, in the ‘*Journal für Ornithologie*,’ pp. 321–327, in an article entitled ‘*Einige Beobachtungen über Farbenwechsel durch Umfärbung ohne Mauser.*’

For further comment on this paper of Gätke's, and on others of similar character by other authors, see *Bull. Am. Mus. Nat. Hist.*, VIII, 1896, pp. 13–44.

this favored island on the general subject of migration, when, as is so often the case, they run counter to the observations of ornithologists at large, with more favorable opportunities for getting at the general facts of migration as displayed over wide areas. It is not an agreeable task to pick flaws in a work received in many quarters almost as oracular,—a work, moreover, so pleasantly written, and apparently with such sincerity of purpose, and containing so much of real value; yet to let such errors pass unchallenged is not the way to promote truth, or to advance the science of ornithology.

Part III (pp. 167–588) gives an 'Account of the Birds observed in Heligoland.' These number 396 (+ 1 added at p. x = total 397),—an extraordinarily large number for a locality of such limited area. A careful synopsis of the list (see Coues, Auk, XII, 1895, pp. 324–342), however, shows that fully one-half are stragglers. Thus, during fifty years, 97 species have been taken or observed only once each; 33 species, only twice each; and 70 species, three times or more. About 130 species are regular migrants either in spring or fall or during both seasons, while about 50 are more or less regular winter residents. Some 16 species have been known to breed, but some of them in only one or two instances, the others, except one, more or less irregularly.

Among the stragglers, the occurrence of fifteen exclusively North American species is recorded, which Herr Gütke shows (p. 124) most probably in nearly every instance reached Heligoland by a journey across the North Atlantic. Other stragglers are casual visitors from the far North; many others, from the far East, and others still from the South, are species which have far overstepped their usual boundaries.

In commenting on the large number of 'casual visitants' that have been taken on the little island of Heligoland, Herr Gütke considers that their appearance in such numbers on so small an area is proof that an incomparably larger number must annually pass across Europe. If, he says "twenty, fifty, or even a hundred examples of Richard's Pipit occur here in one day [of course an exceptional occurrence], these numbers can only represent a minute fraction of the quite incomputable quantity of these birds

which are travelling at the same period from Daüria to Western Europe."

Gütke's list is copiously and interestingly annotated, the annotations often occupying several pages, the records being in most instances very fully and satisfactorily given. The nomenclature, however, is antiquated, being for the most part that of Naumann, and hence dating almost from Gütke's boyhood. In the English translation the equivalent modern names are given in footnotes, when different from those used in the text, as is usually the case. In a few instances the identifications may be open to question, especially in some of the few cases where the species was only observed and not actually taken.

With all its imperfections 'Heligoland' is a book of great interest and value, Part III being a particularly useful contribution to the literature of ornithology. It is also a work that is likely to do much harm, for it is its sensational and inaccurate parts especially that find their way into the current literature of the day, and particularly into magazines and books devoted to the popularization of natural history.

A REVISION OF THE NORTH AMERICAN HORNED OWLS WITH DESCRIPTION OF A NEW SUBSPECIES.

BY WITMER STONE.

IT is not a pleasant task to overthrow a scientific name long in use, but under certain circumstances it seems unavoidable, and the case of *Bubo virginianus subarcticus* (Hoy) is an instance of this kind.

Some years ago while engaged in cataloguing the Owls in the collection of the Academy of Natural Sciences of Philadelphia I found the type specimen of "*Bubo subarcticus* Hoy." The bird was mounted, and on the under side of the stand were written the

following data in the hand of John Cassin: "*Bubo subarcticus* Hoy, Racine, Wisconsin. Original specimen described by Dr. Hoy and presented by him 1853. J. C." The description is in the 'Proceedings' of the Academy for 1852, p. 211, and evidently refers to the specimen in question.

This specimen at once struck me as being much lighter in color than any examples of *subarcticus* that I had examined; in fact it seemed nearer to the description of *arcticus* as given in the books. Not having any specimens of undoubted *arcticus* for comparison, and the figure of this form in 'Fauna Boreali-Americana' being still lighter than the specimen in hand, I let the matter stand until I had an opportunity to make direct comparison.

Recently I showed the specimen to Mr. Leverett M. Loomis, who agreed with me that it must be very close to *arcticus*. A few days later, while together in Washington, we examined specimens of *arcticus* in the National Museum Collection and concluded that the type of *subarcticus* was identical with them.

To make matters sure, however, I sent the type specimen to Mr. Robert Ridgway, on my return to Philadelphia, and after making a careful comparison, he writes me: "The bird is unquestionably referable to *arcticus* Swainson, agreeing closely with specimens in our collection from Winnipeg. It is darker than the specimen described and figured in the 'Fauna Boreali-Americana,' which seems to have been an exceptionally light-colored example."

As a result of this investigation the name "*Bubo subarcticus* Hoy" will have to become a synonym of *Bubo virginianus arcticus* (Swainson), leaving the form from the Great Plains and southwestern United States, which was formerly known as *Bubo virginianus subarcticus* (Hoy), to be renamed. So far as I can ascertain, the only other name that has been proposed for the western Horned Owl is *pacificus* Cassin, 'Illustrations of the Birds of California, Texas,' etc., p. 178.

Cassin here recognizes three varieties of *Bubo virginianus*,—(1) *atlanticus*, the eastern bird, (2) *pacificus*, the western, and (3) *arcticus* Swains., the northern form. He very properly suggests that *subarcticus* Hoy is a synonym of *arcticus* Swains., which suggestion has been ignored by subsequent writers. The names *atlanticus* and *pacificus* were here proposed for the first time. The

former is of course a synonym pure and simple of *B. virginianus* (Gmel.), while under *pacificus* he apparently intended to include all western Horned Owls known to him and not coming under *arcticus* Swains. The diagnosis of *pacificus*, however, clearly applies to the light-colored owls. Mr. Ridgway apparently noticed this fact, and although he had at first used *pacificus* Cass. for the dark owl of the Northwest and Rocky Mountain region, he afterwards proposed the name *saturatus* for this form.

According to the laws of nomenclature *pacificus* Cass. cannot be ignored, and while its application to the light-colored western Horned Owls seems sufficiently clear, the separation of the dark western bird as *saturatus* Ridgw. emphasizes it still more.

Just here, however, there is another point to consider, *i. e.*, whether there are not two well marked races of these light-colored birds included under the old "*subarcticus*."

I have for some years past noticed that the Horned Owls from southern California differed from the light-colored examples from farther east in their uniformly smaller size and the increased mottling on the feathers of the tarsus. These differences I think are sufficiently well marked to warrant the separation of the two forms.

The name *pacificus* Cass. (Dwarf Horned Owl) I would restrict to the small southern California subspecies, as Cassin calls particular attention to the general small size of examples of this variety, and furthermore had California specimens in the series that he studied. For the large form from the Great Plains I would propose the name

***Bubo virginianus occidentalis.* WESTERN HORNED OWL.**

The several races would then be distinguished as follows, using in part the phraseology of Ridgway's 'Manual.'

a'. Color darker, with dusky markings more extensive or more numerous. Plumage much mixed with tawny or ochraceous.

b'. Moderately dark, face mostly rusty and plumage with an excess of tawny rufous. . . . *Bubo virginianus* (Gmel.).

b''. Extremely dark, face usually sooty brown mixed with whitish, plumage with less tawny, sometimes none.

B. virginianus saturatus Ridgw.

a''. Color lighter, gray and buff tints predominating over the darker markings; lower parts whiter.

b'. General aspect above grayish with more or less buffy admixture; dark markings below distinct.

c'. Size small, w. 13 in., tarsi, strongly mottled.

B. virginianus pacificus Cass.

c''. Size large, w. 16 in., tarsi with mottling much less distinct.

B. virginianus occidentalis subsp. nov.

b''. General aspect above white, ground color faded, beneath pure white with dark markings restricted.

B. virginianus arcticus (Swains.).

A specimen of *B. virginianus pacificus* Cass. before me (No. 27905, coll. Acad. Nat. Sci. Phila., San Bernardino, Cal., April, 1887, ♂, coll. by R. B. Herron) measures: wing, 12.95; culmen, 1.48; tarsus (to insertion of hind toe), 1.80; middle claw to sheath, .95.

The type of *B. virginianus occidentalis* (No. 26435, coll. Acad. Nat. Sci. Phila., Mitchell Co., Iowa, winter, 1880, coll. W. L. Abbott), probably a female, measures: wing, 16; culmen, 1.80; tarsus (to insertion of hind toe), 2.50; middle claw to sheath, 1.25.

The markings of *pacificus*, especially beneath, seem to average darker than in *occidentalis*, in such specimens as I have seen. The exact range of the two I cannot ascertain without examining a larger series.

RECENT LITERATURE.

The 'Birds' of 'The Royal Natural History.'¹—The last half of Volume III of 'The Royal Natural History' is devoted to Birds, Volumes

¹ The Royal | Natural History | Edited by | Richard Lydekker, B. A., F. R. S., Etc. | With Preface by | P. L. Sclater, M. A., Ph.D., F. R. S., Etc. | Secretary of the Zoölogical Society of London | Illustrated with | Seventy-two Coloured Plates and Sixteen Hundred Engravings | by W. Kuhnert, F. Specht, P. J. Smit, G. Mützel, A. T. Elwes, J. Wolf, | Gambier Bolton, F. Z. S., and many others | Vol. III. | London | Frederick Warne & Co. | and New York | 1894-95 | [All Rights Reserved.] Super Royal 8vo. Birds, Vol. III, pp. 289-576, Vol. IV, pp. 1-192 (*et seq.*).

I and II and the first half of Volume III being given to Mammals. The work is issued in fortnightly parts, consisting of about 100 pages of text, two colored plates, and numerous text figures. The birds begin with No. 16 (No. 4 of Vol. III), of which Nos. 16 (Dec. 15, 1895) to 20 (Feb. 15, 1896) are now before us for notice. The bird matter thus far includes pp. 289-576 of Vol. III, and pp. 1-192 of Vol. IV, and beginning with the Passeres, extends to about half way through the Diurnal Birds of Prey, and is divided into twelve chapters. Chapters II to VI (Vol. III, pp. 305-544), which include the order Passeres, are by H. A. Macpherson, with some assistance from the editor, Mr. Lydekker, in Chapter II (see footnote to p. 374). Chapters VII to IX (Vol. III, pp. 545-576, and Vol. IV, pp. 1-90), embracing 'The Picarians,' are by R. Bowdler Sharpe. The authorship of Chapter I, 'General Characteristics,—Class Aves' (Vol. III, pp. 289-304), Chapter X, 'The Parrot Tribe,—Order Psittaci' (Vol. IV, pp. 91-139), Chapter XI, 'The Owls and Ospreys,—Orders Striges and Pandiones' (Vol. IV, pp. 140-173), and Chapter XII, 'The Diurnal Birds of Prey, or Accipitrines,—Order Accipitres' (Vol. IV, pp. 174-192, et. seq.) is thus far not indicated. As is easily noticeable, the style of treatment varies in the different parts of the work, as regards symmetry, accuracy, and familiarity of the author with his subject.

The work is to be considered of course from the standpoint of a general popular treatise on the class Aves, with the limitations as to space necessarily entailed by such an undertaking. Hence a minimum of technicalities is to be expected, with perhaps a very unequal allotment of space in proportion to the numerical size of the groups treated. Yet, considering the high scientific standing of the editor, we have reason to expect at least accuracy, if not fullness and uniformity of treatment of the groups that must be marshalled in review. Judged by these standards the work, as a whole, well stands the test, and in general merits the generous patronage of the public. Many of the groups are admirably treated and indicate the work of a practiced hand, as especially the varied assortment of family groups here arrayed under the general term of 'The Picarians.' The same is true, in large measure, for the Parrots and the Birds of Prey.

The great group of Passeres presents greater difficulties, owing to their diversity and numerical abundance, in comparison to the other orders of the class, so that the question of what groups to mention and what to pass unnoticed with so limited a space for their treatment, is obviously one of great embarrassment, and the selection would here severely tax the skill of the expert. Yet it is easy to perceive that the author often finds himself in unaccustomed fields.

The introductory chapter is quite too brief for the satisfactory treatment of the generalities of the subject, but is fortunately supplemented to a considerable extent by the introductory paragraphs to the orders in the body of the work. Yet we think the general reader would have been profited by a few additional paragraphs on feathers,—giving something

for instance about their development, pigmentation, their coloration, and especially their structure in its relation to color. In regard to their nature and development we have only the absolutely erroneous statement (Vol. III, p. 290) that feathers correspond "in *essential structure* to hairs," and that they are "similarly developed," etc., which is also untrue. There is also looseness of statement (p. 299) regarding the barbules and hooklets, due perhaps to excessive effort at condensation of treatment, while the case is a little overdrawn (p. 291) in the statement that "it is impossible to kill a winged bird by compressing its windpipe." We regret also to see the Gätkean ideas introduced under the head of 'Migration' (p. 302), to the effect that "the configuration of continents and oceans" must be invisible to migrating birds, even in the daytime, owing to the great height at which they travel.

The classification followed is essentially that propounded some fifteen years ago by Dr. Sclater, on the ground that, owing to the present diversity of views on the subject, it is probably as good as any for a popular work like the present,—a statement we have no desire to controvert. In regard to the Passeres, the arrangement of Dr. Sharpe is adopted, which places the Corvidæ at the head,—an arrangement which at present seems to meet with wide approval.

It is of course easy to find fault with a popular work of this general character, however good it may be or however conscientiously prepared. Yet we may perhaps be pardoned for pointing to a few errors of statement or omission that would hardly be anticipated in the present connection. Thus (p. 309) the reference to *Xanthura* fails to indicate that this brilliant genus of tropical American Jays is remarkable for its yellow and green colors rather than for its blue and black markings. In speaking of the Siberian Jay (*Perisoreus infaustus*) as "a characteristic bird of the most northern parts of the Old World," it seems strange no reference is made to the fact that the genus *Perisoreus* is even more characteristic (as regards number of species) of the northern parts of North America. Again from the account of the Crossbills, one might infer that all were so closely related as to be probably referable to one species, no reference being made to the group with white wing-bars. In referring to the distribution of the Pipits (p. 432), the omission to note the occurrence of a considerable number of species in South America, taken with the reference to North America, leads to the inference that they are absent from that continent.

In speaking of the Baltimore Oriole (p. 357) there is either a bad jumble of the text of the two paragraphs headed respectively 'Cassiques' and 'The True Hangnests,' or else a most unpardonable lapse, for the Baltimore does not "build in large companies," nor have as many as forty nests on a single tree, nor breed in November, but these statements might well apply to some of the South American Cassiques. In the next paragraph we have the erroneous statement that the Bobolink "winters in Central America and the West Indies," whereas it merely passes through

these regions on its way to and from South America. That some species of Cowbirds (p. 358) "seize upon the nests of others birds, and having driven away the rightful possessors, proceed to rear their own young in their new home," must be a new discovery in the economy of these birds.

Weaver-Birds (Ploceidæ) are said to differ from Finches (Fringillidæ) in that some of the former undergo a partial spring moult; the fact being that many genera of Finches also moult in the spring. Indeed, in many families of birds, in genera closely allied, some have a spring moult and others do not.

Of the Rose-breasted Grosbeak (p. 381), its summer range, it is said, "extends to Labrador." We will not, however, dwell on the inevitable slips in a work of this nature. Among Passeres those inhabiting Europe and especially the British Islands, naturally receive the most attention, many of the more prominent species being noticed at considerable length; on the other hand, those of the two Americas receive little attention, even those of North America coming in for slight notice, and generally only when they belong to genera common also to the Old World. Thus of the great American Family Tyrannidæ, only two of the 400 species are distinctively mentioned, and only one member of the great Family Formicariidæ, the family itself, as a group, being unnoticed. Nor is there any reference to the interesting Family Pteroptochidæ, although the little group of Plant-cutters (Phytotomidæ) receives nearly a page. Of the great number of Sparrows inhabiting North and South America, only one is specially mentioned (that is, exclusive of so-called 'Buntings' and Finches, allied for the most part to Old World forms); and this in such a way as to be unrecognizable to American readers, except for the technical name given in parenthesis. Thus, says Mr. Macpherson, under the heading 'Allied Genera' (p. 416): "The Sparrow-bunting (*Zonotrichia albicollis*) belonging to a group of genera in which the tail is longer than the wing," etc.—four lines in all.

When North American birds are mentioned it is hard to understand why, by both Mr. Macpherson and Dr. Sharpe, vernacular names are given to them which no American reader would recognize, nor any ornithologist, if the technical names were omitted,—names apparently coined to suit the whim of the writer, regardless of the fact that the birds already have book names almost as distinctive and as stable as the technical names of the systematists. Why our White-throated Sparrow should be given the meaningless title of 'Sparrow Bunting,' or our Grackles be dubbed 'Troupials,' or our White-throated Swift be called 'Pied Swift,' to cite a few representative cases, it is hard to conceive.

While the text of Dr. Sharpe's portion of the work is generally much more free from lapses than that relating to the Passeres, there is a curious error on p. 43 (Vol. IV) where in speaking of different species of Night Jars he says: "And a fourth, the one represented in the accompanying figure (*C. virginianus*) tells you to *whip-poor-will!* *whip-poor-will!* in tones wonderfully clear and startling." A glance at the cut, labeled 'Vir-

ginian Nightjar,' shows at once that it is the Night-hawk (*Chordeiles virginianus*) and not the Whip-poor-will, as Dr. Sharpe seems to have supposed. As figures of both species are given in the work from which the figure is taken, it is evident that the wrong figure was accidentally selected.

As already said, the work as a whole is well worthy of the patronage of the public, for if it fails to tell all there is to know about birds, it gives a vast amount of interesting and trustworthy information in a small compass. The illustrations add greatly to its value and usefulness, but they are for the most part old acquaintances that have previously seen service repeatedly in other connections.—J. A. A.

Saunders and Salvin's Catalogue of the Gaviæ and Tubinares.—Volume XXV of the British Museum Catalogue of Birds¹ contains the Gaviæ, or the Terns, Gulls, and Skuas, by Mr. Howard Saunders, and the Tubinares, or the Petrels and Albatrosses, by Mr. Osbert Salvin. The authorities of the British Museum have thus been fortunate enough to secure the two leading specialists on these difficult orders of birds for their elaboration.

The Gaviæ, or the Longipennes of the A. O. U. Check-List, of which 115 species are here recognized, are arranged in twenty genera and two families—Laridæ and Stercorariidæ, the Rynchopidæ being treated as a subfamily of Laridæ and placed between the Terns and Gulls. It is not clear why the name Gaviæ, proposed by Bonaparte in 1850 for a rather extensive and heterogeneous group, should be preferred to Longipennes, as restricted and defined by Nitzsch in 1840, or forty years before the term Gaviæ was narrowed down to its present signification. Neither is it evident why the Skimmers should be interposed between the Terns and Gulls, especially as it is admittedly a difficult matter to draw a satisfactory dividing line between the Terns and Gulls. Yet we have in the present work a subfamily Sterninæ separated from a subfamily Larinæ by a group so distinct from either of these really coalescing groups as to be often of late given the rank of a distinct family.

Passing to details of special interest to American ornithologists, we note the following: *Hydrochelidon surinamensis* is separated specifically from *H. nigra*, on the ground probably that Mr. Saunders does not recognize subspecies; forms that are regarded as entitled to recognition being

¹ Catalogue of the Gaviæ and Tubinares in the Collection of the British Museum. — Gaviæ (Terns, Gulls, and Skuas) by Howard Saunders. Tubinares (Petrels and Albatrosses) by Osbert Salvin. London: Printed by order of the Trustees. Sold by Longmans & Co., 39 Paternoster Row; B. Quaritch, 15 Piccadilly; Dulau & Co., 37 Soho Square, W.; Kegan Paul & Co., Paternoster House, Charing Cross Road; and at the British Museum (Natural History), Cromwell Road, S. W. 1896. = Catalogue of the Birds in the British Museum, Vol. XXV. 8vo, pp. i-xv, 1-475, pl. i-viii.

treated as full species. *Gelochelidon anglica* (Montague, 1813) is preferred to *nilotica* Hasselq., 1762 (this edition of Hasselquist, by the way, is not cited), apparently because the date of *nilotica* is prior to 1766, since no names appear to be countenanced that antedate the 12th (1766) edition of Linné's 'Systema Naturæ.' *Sterna fluviatilis* Naum., 1819, is preferred to *S. hirundo* Linn., 1758, and *S. macrura* Naum., 1819, to *S. paradisæa* Brünnich, 1764, probably for a similar reason. Cabot's Tern is regarded as not separable from the Old World form, for which Mr. Saunders prefers the name *cantiaca* to the earlier *sandvicensis*. The American Herring Gull is also considered as not entitled to separation from the European; but Mr. Saunders's remarks on the subject are not likely to change the opinions of those who hold to a different view, since no new points are adduced, and the fact of an average and fairly constant difference between the two forms is admitted. *Larus barrovianus* Ridgw. is referred to *L. glaucus*, but the other recently described North American species of *Larus* have passed the present ordeal unscathed. The case is somewhat different with *Rissa*, of which only two species, *R. tridactyla* and *R. brevirostris*, are recognized; the slight differences in size and the relative development of the diminutive hind-toe being found inconstant for the two other forms that have sometimes been recognized as *kotzebui* and *policaris*.

Among the little group of North American Skuas the changes in nomenclature are confusing and disheartening. For reasons already given, in place of *Megalestris skua* (Brünn., 1764) we have *M. catarrhactes* (Linn., 1766); in *Stercorarius* the Long-tailed Jaeger receives the name *parasiticus* Linn., while *crepidatus* Banks is applied to the *parasiticus* of the A. O. U. Check-List. This of course is in accordance with views long held by Mr. Saunders on the subject, but against the general consensus of opinion.

Passing now to the Tubinares, Mr. Salvin divides them into four families,—Procellariidæ, Puffinidæ, Pelecanoididæ, and Diomedeidæ,—their constituents being fairly indicated by the names employed. The 109 species recognized are arranged under 25 genera. The three genera most numerously represented are *Oceanodroma*, with 12 species, *Puffinus* with 20 species, and *Estrelata* with 30 species. The following three species are described as new: *Oceanodroma tristrami* (ex Stejneger, MS., p. 354), *Pelecanoides exsul* (p. 438), *Diomedea chionopectera* (p. 443), and *Thalassogeron layardi* (p. 450).

As regards North American species, we note several important changes of nomenclature. Thus *Puffinus gravis* (O'Reilly, 1818) supercedes *P. major* (Faber, 1822); *Puffinus borealis* Cory is treated as a pure synonym of *P. kuhli*; *P. opisthomelas* Coues replaces *P. gavia*, which is considered as restricted to "New Zealand and Australian Seas"; on the other hand, *P. auduboni* is regarded as not separable from *P. obscurus*. *Puffinus stricklandi* Ridgway is referred to *Procellaria grisea* Gmelin, and hence becomes *Puffinus griseus*, the Atlantic and Pacific birds being con-

sidered as not separable. *Priocella* is raised to a full genus. *Fulmarus glacialis rogersii* and *F. g. glupischa* are given the rank of full species, while *F. g. minor* is referred as a pure synonym to *F. glacialis*.

The volume as a whole, despite the few criticisms of nomenclature in which we have indulged, easily takes its place as among the best of this admirable series, and for which ornithologists cannot be too grateful.—J. A. A.

Salvadori's Catalogue of the Chenomorphæ, Crypturi, and Ratitæ.¹—According to the arrangement adopted by Count Salvadori, the order Chenomorphæ consists of three suborders, Palamedææ, Phœnicopteri, and Anseres. The first, embracing the Screamers, consists of only two genera and three species, all South American. The second, containing the Flamingoes, includes three genera and six species, of which four species are American, one only extending northward to Florida. Hence the great bulk of the Chenomorphæ belong to the Anseres, consisting of the single family Anatidæ, here subdivided into 11 subfamilies and 64 genera. The total number of species recognized is 196. Among the Ducks, *Chaulelasmus*, *Mareca*, *Nettion* and *Querquedula* are recognized as full genera. Of the larger genera, *Anas* contains 17 species, *Nettion* 15, and *Querquedula* 5. The following new genera are recognized: *Asarcornis*, type *Anas scutulata* S. Müll. (p. 59); *Pteronetta*, type *Querquedula hartlaubii* Cassin (p. 63); *Nesochen*, type *Anser sandvicensis* Vigors (p. 126); *Elasmonetta*, type *Anas chlorotis* G. R. Gray (p. 287). Also three new species, —*Erismatura æquatorialis*, Ecuador (p. 450); *Merganetta frenata*, Chili (p. 458); *Merganser comatus*, Central Asia (p. 475).

As regards the treatment of North American species, it may be noted further that *Cygnus* is substituted for *Olor* for the Swans; *Chen hyperboreus nivalis* is given the rank of a full species; *Anser albifrons gambeli* is kept separate from *A. albifrons*, although "scarcely different"; under the genus *Branta*, *hutchinsi*, *occidentalis* and *minima* stand as full species. The same is true of *Anas maculosa* Sennett. *Nyroca* is adopted in place of *Aythya*; both date from 1822, but *Aythya* is here ruled out as a *nomen nudum*. *Fuligula* stands as a full genus; and *Aythya marila nearctica* is referred to *F. marila*, with the following remark: "According to Dr. Stejneger, the American form (*nearctica*) has the primaries, from the

¹ Catalogue | of the | Chenomorphæ | (Palamedææ, Phœnicopteri, Anseres),
| Crypturi, | and | Ratitæ | in the | Collection | of the | British Museum. |
By T. Salvadori. | London: | Printed by order of the Trustees. | Sold by |
Longmans & Co., 39 Paternoster Row; | B. Quaritch, 15 Piccadilly; Dulau &
Co., 37 Soho Square, W.; | Kegan Paul & Co., Paternoster House, Charing
Cross Road; | and at the | British Museum (Natural History), Cromwell Road,
S. W. | 1895. = Catalogue of the Birds in the British Museum, Vol. XXVII.
8vo, pp. i-xv, 1-636, pl. i-xix.

fourth quill, with a greyish — not white — area on the inner web. I must confess that I have been unable to appreciate the difference."

Clangula again replaces *Glaucion*, to which both *Glaucionetta* and *Charitonetta* Stejn. are referred as synonyms. The American form of the Golden-eye (*americana*) is not considered separable from true *clangula* (here called *glaucion*). Of course *Harelda* is used in place of *Clangula* for the Old-squaw; and, as specific names published earlier than 1766 are not recognized, *hiemalis* Linn., 1758, is ignored for *glacialis* Linn., 1766; so that the species stands as *Harelda glacialis*. By what rule *Histrionicus* Lesson, 1828, is set aside for *Cosmonessa* Kaup, 1829, is not evident, unless it be to avoid the terrible tautology of *Histrionicus histrionicus*! *Somateria mollissima borealis* is not separated from *S. mollissima*.

If our author is right, our Ruddy Duck must stand as *Erismatura jamaicensis* (Gmelin, 1788), instead of, as universally heretofore, *E. rubida* (Wilson, 1814).

Two species not included in the A. O. U. Check-List are attributed to North America, namely: (1) *Mergus albellus*, which, on p. 467, is said to occur "occasionally in North America," partly apparently on old records now discredited, but also positively on the basis of a specimen in the British Museum, entered (p. 468) as "*v*" ♀ ad. st. N. America, Hudson's Bay Co." (2) *Oidemia carbo* (Pall.), of which a specimen (p. 412) is thus doubtfully recorded from Alaska, "*q.* (?) Juv. sk. St. Michael's, Alaska, Oct. (E. W. Nelson). Salvin-Godman Coll." Also: "? Northwestern America, south in winter to California," with the following remark: "There are no adult specimens from Alaska in the British Museum, so that I am unable to decide Alaskan birds really belong to *Æ. carbo*."

The Crypturi, forming Order XX of the Carinate Birds in the system of the British Museum Catalogue, constitute a single family, with 9 genera and 65 species, of which latter 14 are here described for the first time. The group ranges from Mexico to Paraguay, and the species are exceedingly difficult to discriminate.

The volume concludes with the Ratite Birds, forming four orders and five families, but numbering only about 27 species.

As noted above, many changes from current nomenclature are introduced, most of which would have been needless if the author could have permitted himself to accept the 10th instead of the 12th edition of Linné's 'Systema Naturæ' as his starting point for specific names. This is the more to be regretted, since the 10th edition is now almost universally accepted as the starting point for binomial names in zoölogical nomenclature. We also observe certain lapses from consistency in the use of names in a specific sense which have also been adopted as generic names. Thus unless *Fuligula fuligula* (p. 363) is a lapsus, it would seem proper, in accordance with good modern usage, to employ also *Cygnus cygnus* in place of *Cygnus musicus* (p. 26); *Coscoroba coscoroba* instead of *Coscoroba*

candida (p. 42); *Anser anser* instead of *Anser ferus* (p. 89); *Tadorna tadorna* instead of *Tudorna cornuta* (p. 171); *Casarca casarca* instead of *Casarca rutila* (p. 177); *Querquedula querquedula* instead of *Querquedula circia* (p. 293), and especially in this case where *Querquedula* is often considered as not generically separable from *Anas*; *Nyroca nyroca* instead of *Nyroca africana* (p. 345); *Clangula clangula* instead of *Clangula glaucion* (p. 376); *Merganser merganser* instead of *Merganser castor* (p. 472); *Casuarius casuarius* instead of *Casuarius galeatus* (p. 592). Through some unexplained exception to the author's evident rule, in the case of *Rhea americanus*, Linné is taken at 1758 instead of 1766, which otherwise would give us also *Rhea rhea* (p. 578). Although Brisson's genera are in some instances taken, Brisson's *Anhima* is rejected for the later *Pulamedea* of Linné (p. 2).

Count Salvadori has expended an enormous amount of labor on this thick volume of nearly 600 pages. The bibliographical references are exceedingly full; the references to the anatomy are separated from the others, as are also the references to hybrids, which among the Ducks are so numerous as to form a striking feature of the bibliography. While the part of the work relating to the Anseres will prove so immensely valuable to the general student, the author's revision of the Crypturi will be hailed as a special godsend by those brought into relation with this exceedingly troublesome and difficult group.—J. A. A.

Chapman on Changes of Plumage in the Dunlin and Sanderling.¹—There is no uncertain ring about the present paper. It boldly challenges certain statements of an eminent European authority, Herr Gätke, and proves them erroneous, not by any theoretical arguments advanced to nicely fit the case, but by a simple statement of facts which leave no room for doubt. An interesting chapter of Gätke's book 'Die Vogelwarte Helgoland' is devoted to the long mooted question of changes taking place in feathers without moult, and much stress is laid upon repigmentation and renewal of abraded contour as important factors in the process of passing from the winter to the summer plumage of many species. The Dunlin (*Tringa alpina*) and the Sanderling (*Calidris arenaria*) are two of the species in which the gradual change is described with great minuteness of detail. One can almost see the black color spreading over the gray feathers of the back and the worn tips blossoming, so to speak, into new feathers by a "restoration of the worn and blunted barbs to their previous entirety," but unfortunately for this theory Mr. Chapman has examined no less than fifty-seven specimens of the former species (including the subspecies *pacifica*) and ninety-seven of the latter which show conclusively that a complete moult takes place in both, except in the rectrices and remiges of the Dunlin. Twelve specimens of the Dunlin

¹The Changes of Plumage in the Dunlin and Sanderling. By Frank M. Chapman. Amer. Mus. Nat. Hist., VIII, art. I., pp. 1-8 (March 4, 1896).

taken between April 2 and May 22 show various stages of the moult. "Many of these new black or rufous and black feathers are half grown, while a few are fully grown and their unworn edges are in strong contrast to the ragged borders of the gray winter plumage." In one specimen, "one cannot raise the plumage of any part of the body without discovering numbers of growing new feathers wrapped in their dermal sheaths." Twenty specimens of the Sanderling likewise show a moult in progress during March, April and May. Mr. Chapman has also seen moulting spring specimens of the Golden Plover, Knot and others of the Limicolæ, in which group Gätke states that color changes without moult frequently occur. That no moulting birds should have fallen into this ornithologist's hands is most surprising, and yet on hardly any other assumption can we understand his reaffirmation of the old idea of a color change in worn feathers with restoration by a new growth of the ragged edges. Inasmuch as this theory, resting as it does, upon a most unphysiological basis, is overset in the case of two of the species cited by Gätke in its support, what grounds have we for believing it will apply to any of the others?

He asserts almost dogmatically that a number of species acquire their summer dress without spring moult and Mr. Chapman shows us specimens of two of these very species in the midst of a moult at the time when Gätke declares they are simply growing new barbs on the old feathers and providing in them a fresh influx of new pigment. Can there be any doubt as to who is in error? If fifty years' experience with the birds of Heligoland leads to such deductions as these we may well wonder on what sort of material they are based and hope for more light upon the other species which Gätke has deprived of the normal way of changing their plumage by a moult. To Mr. Chapman we are indebted for the valuable contribution he makes to a subject which has long vexed those who have been readier with strange theories to fit obvious facts than with material to substantiate their theories.—J. D., JR.

Chapman on the Plumage of the Snowflake.¹—The gradual change from the brown tinged winter plumage of the Snowflake into its abraded black and white summer dress is clearly demonstrated to occur without the loss of a single feather. Diagrams show at a glance that the dorsal feathers of the male during the winter gradually lose their brownish margins and by June "in place of the rounded outline of the brown-tipped feather we have left only its pointed black base. The rest of the plumage undergoes a similar alteration which in some places is evidently assisted by fading." The knowledge of this change without moult is not new, although among our early writers Wilson and Audubon do not seem to have been aware of it. Richardson and Swainson in 'Fauna Boreali-

¹ On the Changes of Plumage in the Snowflake (*Plectrophenax nivalis*). By Frank M. Chapman. Bull. Amer. Mus. Nat. Hist., VIII, Art. II., pp. 9-12 (March 5, 1896).

Americana,' 1831, and Nuttall in his 'Manual,' 1832, describe it, but not as if they considered it new. Mr. Chapman, however, goes further and would explain why the dorsal feathers wear only down to the black bases. He says that microscopical examination "shows that at their apical portion the barbs are separated and that the barbules do not become fairly interlocked until the black basal part is reached." The black area is therefore more protected and furthermore it is asserted that the black pigment by virtue of its density adds strength to the feather. The fact that the female never entirely wears away the brownish border and the fact that the "interlocking" of the barbules in many cases does *not* correspond with the black area, both militate against Mr. Chapman's theory and suggest other factors to explain the deciduous feather tips.

Incidentally a new and valuable point of difference between the plumages of the two sexes is brought out. "The male has the feathers of the head, nape and rump basally white, while in the female they are basally black,"—this difference holding at all seasons of the year. The Snowflake is one of the interesting species that undergo but one moult in the year.—J. D., Jr.

Allen on Alleged Changes of Color in the Feathers of Birds without Moulting.¹—It is small wonder that this paper should bristle with exclamation points. It is a summary and criticism of the work of some of the more important writers upon the subject of color changes in feathers without moult, and it deals unsparingly with those who have asserted as possible the complete rejuvenation of an abraded feather. Beginning apparently with the Rev. John Flemming, there have been many writers of greater or less repute, even down to the present day, who have advanced various theories to account for color changes in plumage otherwise than by moult. The most radical of them have assumed that a recoloration of the individual feathers takes place and even a renewal, by a new growth of barbs, of the ragged edges of worn feathers. After stating that this "delusion" "forms a most instructive chapter in the general history of the origin and persistence of error," Dr. Allen proceeds to sketch this history and demonstrate the worthlessness of most of the evidence presented in its support. He maintains that, almost without exception, the hypotheses advanced are not supported by facts and that if moulting specimens of birds had not been so generally discarded in making collections, speculation upon supposed color changes would not have run riot. In brief, "the inventors of these diverse theories have assumed and attempted to explain conditions that in nine cases out of ten had no existence; namely, a color change demonstrately due—normally at least—to molt, which they have supposed must happen in some other

¹ Alleged Changes of Color in the Feathers of Birds without Molting. By J. A. Allen. Bull. Am. Mus. Nat. Hist., Vol. VIII, Art. III, pp. 13-44 (March 18, 1896).

way." This is the matter in a nutshell. Moulting birds have not fallen into the hands of some of the older observers and they have jumped to the conclusion that no moult had taken place. Even so, it is not easy to understand why the observations of Bachman, Homeyer, Brehm and others who have traced the various stages of moult in many species should have had so little weight against the opinions of Ord, Yarrell, Schlegel, Fatio, Gätke, and the other delusionists. But since we find the latter still supported by reputable writers of to-day, the present paper is all the more welcome, and ought to stimulate further investigations; for if it can be proved that a certain species acquires by moult the plumage that it theoretically should acquire by recoloration and rejuvenation, theory begins to totter. This is exactly what Dr. Allen does, and he cites a number of species in his support, so that the theories for the most part become respectable ruins. The fact seems to be that few observers have had sufficient material on which to build, and if the time devoted to inventing theories to fit the material had been intelligently spent in accumulating such specimens as were needed, the many fanciful and superfluous hypotheses now current would not have arisen. It is hardly profitable to dwell upon them and they may be read in the paper now under discussion. Neither is a microscope necessary to controvert them. When, for example, Severtzof by aid of this instrument describes a color bearing fluid ascending in the old feather by capillarity, exuding from the broken barbs, or depositing its pigment in successive layers on the cell walls, what do such observations mean if the feather is really renewed by a moult? Dr. Allen, by proving the delusionists wrong in part, believes them wrong in all their conclusions and gives adherence to the opinion of Bachman who, in 1839, said: "If the feathers in birds, then, which have been long stationary in their growth, are capable of receiving a new set of secretions, and of assuming opposite colors, we must seek for some new law of nature not hitherto discovered." — J. D., Jr.

The Mockingbird and *Yucca aloifolia*.—The sixth annual report of the Missouri Botanical Garden¹ contains one paper of especial interest to ornithologists. It is entitled 'Studies on the Dissemination and Leaf Reflexions of *Yucca aloifolia* and other Species,' by Herbert J. Webber, and the facts it brings to light are strikingly illustrative of the close relations which economic ornithology and botany may have for each other. The fruit of this species of yucca has an edible sticky pulp, in which the seeds are imbedded without a core. Mr. Webber finds that the Mockingbird is particularly fond of this fruit and is an important agent in the dissemination of the seeds. In eating the pulp some of the seeds stick to the bill and are shaken off, falling at a suitable distance from the plant to allow of germination and growth. But in their haste and

¹ Missouri Botanical Garden. Sixth Annual Report. St. Louis, Mo. Published by the Board of Trustees, 1895.

greediness the birds swallow many of the seeds. Mr. Webber experimented with a captive Mockingbird and found that the seeds were readily swallowed with the fruit and were evacuated in from fifteen minutes to an hour in good condition for germination. During about four hours the bird ate and evacuated fifty-one seeds. A number of these were planted, and a fair proportion grew into healthy young plants. The Mockingbird is also responsible for a third method of dissemination. It will readily be seen that, as the bird feeds, many of the seeds drop directly down. Some of them fall into the crown of upturned leaves immediately beneath the fruit-stalk and stick there. After the cluster has ripened all its fruit, a lateral branch develops and shoots up beside the fruit-stalk, bearing a new crown of leaves and thus prolonging the trunk, while the old leaves reflex and point downwards. With the reflexion of these leaves, the seeds, now dry, roll or slide down the inclined plane thus formed and are shot out to a safe distance from the parent plant. Those seeds which originally fall between the leaves of the crown naturally reach the ground in the same way by the reflexed blades of the previous leaf-cluster. This yucca has in the larva of a moth another aid to dissemination, but that is a story for the entomologist. — F. H. A.

Loomis on California Water Birds.¹ — The present paper gives the results of Mr. Loomis's observations made off Monterey, California, from Dec. 11, 1894, to Jan. 13, 1895. Forty-three species are formally noticed, of which 11 are Gulls of the genus *Larus* — probably a number not exceeded on any coast, at this or any other season. The annotations relate generally to the manner of occurrence of the various species, but in several cases include descriptions of little-known phases of plumage. The Ancient Murrelet (*Synthliboramphus antiquus*) is reported as common, wintering in considerable numbers on the coast of California, although previously recorded as a California bird, as Mr. Loomis observes, apparently from only a single specimen taken off Monterey in January, 1874. Mr. Loomis also reports the Mew Gull (*Larus canus*) as apparently common on the California coast in winter, although its distribution in the second edition of the A. O. U. 'Check-List' is stated to be "Europe and Asia; accidental in Labrador?." Mr. Loomis calls attention, however, to a former record for California by Mr. Henshaw (Auk, II, p. 232).

Preceding the annotated list (pp. 2-14) Mr. Loomis presents and discusses the general facts of migration as observed in respect to the water birds of the California coast in winter. He brings into special prominence the evidence of a southward migration in winter to breeding grounds in the southern hemisphere of certain species of Shearwaters, and

¹ California Water Birds, No. II. Vicinity of Monterey in Midwinter. By Leverett M. Loomis, Curator of the Department of Ornithology in the California Academy of Sciences. Proc. Cal. Acad. Sci., Ser. 2, Vol. VI, 1896, pp. 1-30, with Map. (Feb. 21, 1896.)

from this proceeds to discuss the causes of migration in general, and the means by which birds are guided in their long migratory journeys. He discredits the possession by birds of a "mysterious sense of direction," believing they are guided by natural phenomena.

This paper is an excellent counterpart of his former paper, giving an account of his observations at the same locality during midsummer, 1894, the two together adding greatly to our knowledge of the movements, habits and relative abundance of the water birds of the California coast.

—J. A. A.

Publications Received. — Allen, J. A. (1) The Origin and Relations of the Floras and Faunas of the Antarctic and adjacent Regions. Vertebrata of the Land; Birds and Mammals. (Science, III, No. 61, Feb. 28, 1886.) (2) Alleged changes of Color in the Feathers of Birds without Molting. (Bull. Am. Mus. Nat. Hist., VIII, 1896, pp. 13-44.)

Bocage, J. V. Barboza du. (1) Subsídios para a fauna da Ilha de Fernão do Po — Vertebrados terrestres. (Jorn. de Scien. Math., Phys. e Nat. da Acad. real das Sci. de Lisboa, IV, No. 13, Dec., 1895, pp. 1-15.) (2) Aves de Benguela da Exploração Anchieta. (*Ibid.*, pp. 21-23.)

Cherrie, George K. Exploraciones Zoologicas efectuadas en el Valle del Rio Naranjo en el año de 1893, Aves. (Anales del hist. fis-geogr. nac., VI, 1893. Also separate, 8vo, pp. 19.)

Chapman, Frank M. (1) The Changes of Plumage in the Dunlin and Sanderling. (Bull. Am. Mus. Nat. Hist., VIII, 1896, pp. 1-8.) (2) On the Changes of Plumage in the Snowflake (*Plectrophenax nivalis*). (*Ibid.*, pp. 9-12.) (3) Handbook of Birds of Eastern North America. Third Edition.

Cory, C. B. Hunting and Fishing in Florida, including a Key to the Water Birds known to occur in the State. Sm. 4to, pp. 304. Numerous illustrations. Boston: Estes and Lauriat, 1896.

Dubois, Alph. Les Animaux nuisibles de la Belgique. Mammifères, Oiseaux et Reptiles. 8vo, pp. viii, 203. Bruxelles, 1893.

D'Urban, W. S. M., and Murray A. Mathew. The Birds of Devon. Supplement. 8vo, pp. 32. London, R. H. Porter, 1895.

Finsch, O. (1) Zum Schutz des Wasserschwätzers (*Cinclus aquaticus*). (2) Charakteristik der Avifauna Neu-Seelands als zoo-geographische Provinz in ihren Veränderungen und deren Ursachen. (Globus, LXIX, No. 2-4.

Harvie-Brown, J. A. The Tufted Duck in Scotland — its increase and distribution. (Ann. Scottish Nat. Hist., Jan., 1895.)

Jacobs, J. Warren. Eggs of Native Pennsylvania Birds. A World's Fair Collection. 8vo, pp. 10, with photographic illustrations. 1895.

Knowlton, F. H. The Great Auk. An Extinct Bird of much Renown. (The Feather, I, No. 4, Jan., 1896.)

Loomis, Leverett M. California Water Birds, No. II. Vicinity of

Monterey in Midwinter. (Proc. Cal. Acad. Sci., ser. 2, VI, pp. 1-30, Feb., 1896.)

Lydekker, Richard (editor). Warne's Royal Natural History, Nos. 16-20, Dec. 15, 1895-Feb. 15, 1896. Birds. Super Royal 8vo. Frederick Warne & Co., 3 Cooper Union, New York. Published in fortnightly Parts, 50 cents each.

Meyer, A. B., and L. W. Wigglesworth. (1) Bericht über die 5-7 Vogelsammlung der Herren Dr. P. und Dr. F. Sarasin aus Célebes. (Abh. und Ber. d. Königl. Zoolog. u. Anthr.-Ethn. Mus. zu Dresden, 1896-97, No. 1, pp. 1-16.) (2) Eine Vogelsammlung von Nordost Célebes und den Inseln Peling und Banggai. (*Ibid.*, No. 2, pp. 1-20.)

Richmond, Charles W. Description of a New Species of Plover from the east coast of Madagascar. (Proc. Biol. Soc. Wash. X, 1896, pp. 53, 54.)

Salvadori, T. (1) Catalogue of the Chenomorphæ (Palamedeæ, Phænicopteri, Anseres), Crypturi, and Rattitæ in the Collection of the British Museum. 8vo, pp. xv, 636, pll. i-xix, = Brit. Mus. Cat. Birds, Vol. XXVII, 1895. (2) Note on *Anas erythrophthalma* Wied. (Ibis, Jan., 1896, pp. 99-101.) (3) Uccelli raccolti da Don Eugenio Dei Principi Ruspoli durante l'ultimo suo Viaggio nelle regioni dei Somali e dei Galla. (Ann. del Mus. Civ. di Storia Nat. di Genova, Ser. 2, XVI, pp. 43-46.)

Schalow, Herman. Henry Seebohm. (Orn. Monatsb. IV, No. 2, 1896, pp. 17-23.)

Actes de la Société Scientifique du Chili. Tome V, Livr. 1-3, Dec., 1895.

American Journ. Sci., Jan.-March, 1896.

American Naturalist, Jan.-March, 1896.

Annals of Scottish Nat. Hist., Jan., 1896.

Aquila, II, Nos. 3, 4, Dec., 1895.

Bulletin British Ornithologists' Club, Nos. 31, 32, 1896.

Forest and Stream, XLVI, Nos. 1-13, 1896.

Medical Age, XIII, No. 24, XIV, Nos. 1-4, 1896.

Naturalist, The, Month. Journ. Nat. Hist. for North of England, Jan.-March, 1896.

Nidologist, The, III, Nos. 6, 7, 1896.

Observer, The, VII, Jan.-March, 1896.

Oregon Naturalist, The, II, No. 12, III, Nos. 1, 2.

Ornithologische Jahrbuch, VII, No. 1, 1896.

Ornithologische Monatsberichte, IV, Nos. 1-3, 1896.

Ottawa Naturalist, The, IX, Nos. 10, 12, 1896.

Our Animal Friends, XXIII, Nos. 5-7, 1896.

Proceedings of the Natural Science Association of Staten Island, N. Y., V, No. 2.

Proceedings Acad. Nat. Sci., Philadelphia, pt. 3, Oct.-Dec., 1895.

Report U. S. Secretary Agriculture, 1895.

Shooting and Fishing, XIX, Nos. 11-20, 1896.

Zoölogist, The, Nos. 229-231, 1896.

GENERAL NOTES.

Brünnich's Murre at Cape Charles, Virginia.—Mr. Geo. S. Morris has in his collection a male Brünnich's Murre (*Uria lomvia*) taken Dec. 31, 1890, at Cape Charles, Va., and I have a female taken by myself at the same place on Dec. 14, 1895. As I do not find this bird in the Virginia list, these captures may be of interest, as it extends the range of this winter visitor. There had been a northeast storm for five days, and the specimen I took was either very tame or else exhausted, as it was shot without any trouble. The stomach was entirely empty and there was no fat on the body. Both of these specimens were fully identified by Mr. Witmer Stone of the Philadelphia Academy of Natural Sciences.—I. N. DEHAVEN, *Ardmore, Montgomery Co., Pa.*

The Parasitic Jaeger near Cleveland, Ohio.—Last November, while on a shooting trip to Sandusky Bay, I was told by a friend, Mr. A. E. Kelly, a local shooter, of two birds which he described as "web-footed hawks" that he had seen pursuing the Gulls and Terns. One of the pair he had already shot and sent to the Smithsonian Institution; the other he shot and sent to me a few days later, when I found it to be a female Parasitic Jaeger (*Stercorarius parasiticus*). Mr. Ridgway also found the specimen sent him to be of the same species.

This species is not included in Dr. Wheaton's list of Ohio birds in the report of the Geological Survey, but I find in the Proceedings of the Cleveland Academy of Science, in a paper read by Dr. Kirtland in November, 1857, an account of a bird taken near the mouth of Rocky River, Lake Erie, which he considers as probably of this species.

The specimen sent me had a minnow and a quantity of dark feathers in its stomach. Its skin is now in the collection of Case School of Applied Science.—F. M. COMSTOCK, *Cleveland, Ohio.*

***Puffinus tenuirostris*, off San Diego, California.**—On Jan. 9, 1896, while collecting sea birds about three miles west of Point Laura Light-house, a number of dark Shearwaters were seen, that seemed to me to be much too small for *P. griseus*. They were usually single birds, though several times loose companies of from three or four to a half a dozen sailed by. They were very shy and after several ineffectual attempts to get a shot I gave them up. Just as I was starting for home, however, two birds appeared from opposite directions and lit near my boat, one on either side; both were secured and one proved to be an undoubted *P. tenuirostris*.

This species has not before been recorded on the Eastern Pacific south of British Columbia, although it extends along the coast of China to Australia on the Western Pacific. Several years ago I felt reasonably sure that I had seen *P. tenuirostris* along the coast of Southern California,

but as all of the dark specimens of *Puffinus* that I secured proved to be *griseus*, I had about concluded that I was mistaken.

I am now convinced that I was correct, and that the Slender-billed Shearwater, if not of regular occurrence, is periodically common along our Southwestern coast to Lower California. — A. W. ANTHONY, *San Diego, Cal.*

The Skull of the Young Cormorant. — The rapidity with which changes take place in growing birds has often been noted, and a remarkable instance of this is found in the Cormorants.

As is well known, Cormorants are among the best examples of desmognathous birds, premaxillaries, anterior palatines, and maxillo-palatines being completely fused. There is also no trace of narial openings in the adult and no hint of basi-ptyergoid processes. Yet the nestling of *Phalacrocorax urile* is schizognathous and holorhinal, the narial openings being large, while the sphenoid bears good-sized basi-ptyergoid prominences.

Any one who has the good fortune to be located near a Cormorant rookery has a splendid chance to ascertain just when the narial openings close, or, if he be charitably inclined, he might collect for the United States National Museum, which would furnish alcohol and a can, a series of young taken at short intervals from the time of hatching to the time of leaving the nest. — F. A. LUCAS, *United States National Museum, Washington, D. C.*

Clangula hyemalis at San Diego, California. — On January 13, Mr. L. Belding handed me a fine specimen of the Old-squaw that he had shot in the harbor of San Diego, but a few hours previously. He informed me that the bird was alone near one of the city wharves, no other ducks of any species being in the immediate vicinity.

This record somewhat extends the range of the species on the Pacific Coast, there being but few records for the State and none from south of Santa Cruz Island, where Mr. Belding informed me that a specimen was taken several years ago and recorded in Wheeler's Surveys West 100th Meridian. — A. W. ANTHONY, *San Diego, Cal.*

Occurrence of Great White Heron at Escondido, California. — A little while ago I accepted an invitation to see a Heron, which had been killed and mounted for a parlor ornament. I was told that the bird had been killed during April, 1895. It proved to be a fine specimen of the *Ardea occidentalis*. — J. MAURICE HATCH, *Escondido, Cal.*

Note on the Flexor hallucis brevis in the Night Heron (*Nycticorax nycticorax naevius*). — While dissecting the muscles of the foot of a Night Heron I was surprised to find that the *flexor hallucis brevis* was perforated at its insertion by the *flexor hal. longus*, thus becoming a *flexor perforatus dig. I*, similar to the *flexores perforati dig. II, III, IV*.

This perforation of the flexor h. brevis seems to be of a rather rare occurrence since Hans Gadow, in his great work on birds, forming part of Brown's 'Klassen und Ordnungen des Thier-reich's,' mentions only three genera, with this perforation of said muscle, namely, *Talegalla*, *Crex* and *Bucorvus*.

Though he refers to the fact that he found this muscle (fl. h. b.) exceedingly well developed in *Ibis*, *Grus* and *Ciconia*, he does not mention any perforation of said muscle, which he surely would have done, had he found it to be so.

In my specimen this muscle arises from about the proximal half of the *tarso-metatarsus*. In the middle of the tarsus it divides into *two* branches, or tendons which completely unite before their insertion on the phalanx¹ of the hallux. The flexor h. longus, which perforates the short flexor, is connected by a small vinculum with the 'flexor profundus' as in the majority of Ardeidæ. It certainly would be interesting to examine these flexores of the hallux in the other genera of the Ardeidæ.—ARTHUR RESLER, *Baltimore, Md.*

Porzana noveboracensis near Ottawa, Canada.—On the 22d of October, 1895, I shot a male Yellow Rail in a marsh some twenty-four miles from this city. This I think is the first specimen obtained in this vicinity.—GEO. R. WHITE, *Ottawa, Ontario, Canada.*

Crymophilus fulicarius in Maine.—It seems worth while to make a note of the capture of some recent specimens of the Red Phalarope (*Crymophilus fulicarius*) on the southwestern coast of Maine, not only because the bird is uncommon there, but because data as to the exact time of its occurrence are not at all full. An adult female in fine plumage was taken on Peak Island, Portland Harbor, on May 17, 1892, and is now in my collection. Two other specimens were sent to me in the flesh from York Beach, May 8, 1893.—HENRY H. BROCK, *Portland, Me.*

Crex crex in Maine.—The occurrence of *Crex crex* near Portland, Me., was noted in an editorial paragraph of the 'Ornithologist and Oölogist,' Vol. XV, p. 30, as follows: "H. H. Brock reports a specimen of the European Corn Crake (*Crex crex*) killed by John Whiting in Falmouth, Me., about four miles from Portland. Another was shot at the same time, but was so mutilated that it was thrown away."

I feel that the importance of this capture demands a more detailed statement, especially in view of the fact that the above notice seems to have been often overlooked. The bird is an unquestionable *Crex crex* in extremely fine plumage and of typical coloration. It not only agrees closely with printed descriptions, but with the several European specimens with which I have compared it. The date of its capture was October 14, 1889, and the locality the 'Dyke' Marsh in Falmouth, where so many other rare waders have been taken. It was shot by Mr. John Whit-

ney, — not "Whiting." It came into my hands at once, was preserved by myself, and is now in my collection. Great importance should not, of course, be attached to the closing sentence of the paragraph above quoted, which was based on the statements of a gunner not skilled in identifying birds, though undoubtedly truthful.— HENRY H. BROCK, *Portland, Me.*

Baird's Sandpiper in Michigan. — On August 20, 1895, Mr. Leon J. Cole and myself collected a female Baird's Sandpiper (*Tringa bairdii*) in Ottawa County, Michigan. This is the second or third, if not the first record of this bird's occurrence in the State. — W. E. MULLIKEN, *Grand Rapids, Mich.*

Western Sandpiper (*Ereunetes occidentalis*) **more abundant than the Semipalmated** (*E. pusillus*). — On Two-mile Beach, Cape May County, New Jersey, from the 1st to the 15th of September, 1895, I found both varieties of *Ereunetes* quite abundant in large flocks; and out of thirty-five specimens taken, twenty were unquestionably *occidentalis* and fifteen *pusillus*. The birds were all carefully measured and the colors noted. The bills of the so-called western variety varied from .87 to 1.07, males and females, ten measuring over 1.00, and the back of each was uniformly colored with a very reddish tinge.

The bills of the fifteen Semipalmated measured from .63 to .78, and were uniformly gray on the back, excepting three which had a slight tinge of red. I have never met with the western variety before, that is, to my knowledge, for it was only of late that I learned the difference, which is probably the excuse of many of us who otherwise might have found the bird just as common as I did. In the spring migration, and perhaps in the fall, I hope to look for it again.

Mr. Brewster mentions in 'The Auk' (Jan., 1889, p. 69) that a number of these birds (*occidentalis*) were taken by Mr. J. C. Cahoon on Monomoy Island, Mass., during July, August and September, 1888, and it may be that the bird is not nearly so accidental as it has been heretofore supposed. — WM. L. BAILY, *Philadelphia, Pa.*

Woodpeckers' Tongues — a Plea for Aid. — The tongues of our North American Woodpeckers are, as the readers of 'The Auk' well know, mostly barbed at the tip. Unless they have devoted some attention to the subject they may not, however, know that the tongue of young Woodpeckers are barbless, and that it is an interesting question just when the barbs make their appearance. The tongue of a full-fledged nestling of *Dryobates villosus*, a species whose tongue is remarkably well armed when adult, bears only fine reflexed hairs along the edge, and just at present no specimens are available to show when the barbs make their appearance. I should be greatly obliged to any readers of 'The Auk' who may collect any young Woodpeckers during the year, especially such as are about to leave, or have recently left the nest, if they will kindly send me the tongues. It

is an easy matter to save them when making a skin, and no preparation is necessary other than to allow the tongue to dry, as a little soaking will restore the tongue nearly to its fresh condition.—F. A. LUCAS, *U. S. National Museum, Washington, D. C.*

Pinicola enucleator in Westchester County, N. Y.—Some two miles northeast from Sing Sing, N. Y., on February 12, 1896, I shot a male Pine Grosbeak in high plumage. The bird was in one of a few pine trees in a considerable grove of cedars. Careful search in the vicinity failed to reveal others.—L. S. FOSTER, *New York City.*

The Pine Grosbeak at Poughkeepsie, N. Y.—The Pine Grosbeaks (*Pinicola enucleator*) have been very numerous in the grounds surrounding Vassar College, Poughkeepsie, this winter. They were attracted perhaps by the large number of spruce trees growing there which seem to offer them very palatable food. They have created quite a havoc among these trees. Early in the winter as I was walking among the evergreens, I found the snow literally carpeted with tips of the spruce trees and fragments of buds and seeds. On examining the twigs I found that the buds were eaten and that there were indications of pecking at the points of separation. I had never seen the ground so covered, and perceived at once that there was some unusual cause for such devastation. I looked about among the trees but saw only a pair of Kinglets, and I could not in conscience charge them with such wholesale destruction. I therefore suspected the Pine Grosbeaks, and my suspicion was later confirmed by my catching them in the very act. This flock has consisted almost entirely of young males and females, as is usually the case. One red male was noted early in January feeding with the flock, and later another was found dead.

The weather has not been continuously severe, and the ground has not been covered with snow more than a week at a time. The Grosbeaks are still here, March 13.

A Red-breasted Nuthatch (*Sitta canadensis*) has also been seen this winter. It is an uncommon visitant in this vicinity.—CAROLINE E. FURNESS, *Vassar College, Poughkeepsie, N. Y.*

The Pine Grosbeak (*P. enucleator*) in New Jersey.—On Sunday, March 8, 1896, while driving through Wortendyke, about two miles west from here, I saw two birds of this species in a fir tree by the roadside. There was no possibility of a mistake as I was within twenty feet and had a good view of them. They were either females or young males, and their thick bills and white wing bars were very noticeable. About an hour later, while in Allendale, I saw another of the same species in a small tree, bare of leaves, in a field adjoining the highway. Although I went over the same ground the two next following days I did not meet with any Pine Grosbeaks.—DELAGNEL BERIER, *Ridgewood, N. J.*

Abnormal Plumage of a Pine Grosbeak.—On the 30th of December, 1895, I took a specimen of the female Pine Grosbeak (*Pinicola enucleator*) at Shelburne, N. H. On looking the bird over carefully I noticed an unbroken ring of feathers, like those of the upper back in color and texture, extending over the left shoulder, where the band measures .75 of an inch in width, and continuing across the breast and terminating on the right shoulder, its width having decreased .20 of an inch. The band is composed of thirty-three feathers, that is, beginning to count as soon as they are out of their normal position on the back, and are of much deeper slate color than those above or below them; the centre of each feather is tinged with crone yellow and they are longer than the surrounding ones, standing out almost like a ruff. The flesh of the neck was perfectly normal and the bird apparently had never been injured. I have the specimen now in my collection.—REGINALD HEBER HOWE, JR., *Longwood, Mass.*

The American Crossbill at Sea.—Early on the morning of February 26, 1896, an American Crossbill (*Loxia curvirostra minor*), a female or dull-colored male, was found on the deck of the steamer 'Trinidad' bound for New York from the Bermudas. I saw the bird, which was in an exhausted condition, at eight o'clock, and was told that it had come aboard some time before that hour. The American coast must then have been about three hundred miles distant.

When the 'Trinidad' left Grassy Bay, late in the afternoon of February 24, there was little wind, nor was there much until noon of the day following, when it began to blow from the northeastward, freshening constantly, and developing into a gale before the bird came aboard.—JOHN CLIFFORD BROWN, *Portland, Me.*

Harris's Sparrow in Spring Dress in Autumn.—While out shooting on Nov. 1, 1895, I shot a Harris's Sparrow (*Zonotrichia querula*) in full spring plumage. It is a male bird of the year. It was in a large flock of Harris's Sparrows, but was the only one in spring plumage, all the others being in fall dress.—SIDNEY S. WILSON, *St. Joseph, Mo.*

A Brown Thrasher (*Harporhynchus rufus*) in Massachusetts in Winter.—On December 15, 1894, I discovered a Brown Thrasher in Arlington, Mass. I made my identification as sure as possible without shooting the bird, because I knew that the middle of December was later than this bird usually remains in Massachusetts. A few days after I first saw him, Mr. Walter Faxon, to whom I had reported my observations, again found the bird in almost exactly the same spot.

From Dec. 15 until Christmas, the bird was visited regularly, and he seemed to be able to supply himself with food; but on Dec. 27, there came the first heavy snowstorm of the winter, covering the ground with from four to five inches of snow, on top of which was a crust strong

enough to bear a man's weight. With this snow on the ground, it seemed probable that the Brown Thrush would be unable to get food enough to keep alive. Consequently, from Dec. 27 till March, we took food to him regularly, at least as often as twice a week. We gave him yellow corn meal soaked in water or milk for his staple diet. This food we sometimes varied with bread, pieces of meat cut fine, meal-worms, etc. He always ate whatever we gave him with a good appetite, as soon as we were a few yards off. By March 5, the snow had melted sway in many spots, and we saw the bird for the last time on that day.

When at rest, he carried his left wing lower than the right. For this reason we supposed that he had been wounded in the wing, and so prevented from making the long autumnal migration. Whether or not he would have been able to take care of himself without outside help we have no means of knowing; but he ate what we brought him so eagerly, and so soon after we offered it to him, that it seemed probable that he got very little other food after the first heavy snowfall. — ARTHUR SCOTT GILMAN, *Cambridge, Mass.*

A Few Notes from Maine.—*Accipiter velox*.—On Aug. 17, while at Jackman, Me., I noticed a large flock of at least 150 Sharp-shinned Hawks flying southwards. The birds composing the flock were distributed over an area of perhaps three miles, and were not flying steadily along when seen. Some were flying, while others would light on the tops of trees along a roadside which ran in the general direction in which they were flying. After resting a few minutes they would resume their flight, passing other members of the flock that were resting, so that some of the birds were constantly on the wing. As it was very difficult to count them, I am sure that I underestimated rather than overestimated their numbers. It seems odd that they should have been flying southward so early in the season, and in such a large body.

***Pinicola enucleator*.**—The Pine Grosbeaks are at present to be seen daily in the vicinity of Bangor, Me., and I believe they are present this winter in even greater numbers than were here three years ago in 1892–1893. The proportion of red males seems to be about one to every ten dull-colored birds. What is remarkable is the extremely early date at which I saw the first birds this fall. On Oct. 26, while hunting at Mud Pond, about ten miles from Bangor, I saw a flock of ten or fifteen Grosbeaks. To make doubly sure I shot two of them, but found, on coming to skin them, that they were moulting, and their feathers were so loose that it was impossible to save the skins. On dissection they proved to be young males. Their stomachs contained a mass of fir buds and seeds. They were next seen on Nov. 10, near Orono, about nine miles from Bangor, and presumably belonging to a different flock, as they were about five miles from the locality where the birds were previously seen. After this they were seen every few days, but I did not see any in the city of Bangor until the last week in December. From that time up to the present date, Feb. 17, I have

seen them in the city nearly every day. Their chief food seems to be the seeds of crab-apples, and mountain ash berries.

Phalacrocorax dilophus.—This species is not uncommon along the Maine coast, but it is rare in the interior of the State. We have in the Maine State College collection a specimen of the Double-crested Cormorant which was shot at Kingman, Penobscot County, Me., about Nov. 18, 1895, and presented to the college by Rev. J. W. Hatch. — O. W. KNIGHT, *Bangor, Maine*.

Three Winter Notes from Longwood, Massachusetts.—I noted a flock of nineteen White-throated Sparrows (*Zonotrichia albicollis*) on the 8th of December, 1895, and again on the 21st, when three specimens were taken, one adult and one immature male and one adult female. This flock remained in the locality of an old dump, among tree trunks and general rubbish,—a protected spot. I have noted this flock since the 8th and 21st on the following dates: December 22 and 25; January 2, only eight being then in the flock; January 19, three of the flock noted in a snow storm; three again on the 25th, and since this latter date they have entirely disappeared from the locality, the weather having not become, however, any more severe.

On the 16th of November I noted in the same locality a Winter Wren (*Troglodytes hiemalis*) and on the 25th shot, I think, the same bird. This is another record of the wintering of this species near Boston, Mass.

On the 25th of December, 1895, I also noted a male Chewink (*Pipilo erythrophthalmus*) in company with a flock of White-throats, mentioned above. He flew from a thicket and perched for a moment in the top of a pear tree, called *shewink* several times and disappeared. This is the first record I believe of *Pipilo erythrophthalmus* in Massachusetts during the winter. One was recorded at Portland, Connecticut, in January. Since writing the above I have learned from Mr. Brewster that a female Chewink was sent to him which was shot on January 2, in Bedford, Mass., some ten miles to the northwest of here.—REGINALD HEBER HOWE, JR., *Longwood, Mass.*

Bird Notes from Erie County, New York.—Among the rarer summer birds found near Springville, New York, may be mentioned the American Egret (*Ardea egretta*). A young bird of the year was taken on the Cataraugus Creek on August 10, 1881, by Mr. Depew of Long Island. The specimen is now in my collection.

The Horned Lark and State-colored Junco have been found to be regular breeders in this vicinity. The Larks lay their eggs about the first week in April and the Juncos build their nests the last of May. In the middle of June, 1895, the writer found the Junco breeding on the mossy slope of a woodland ravine only a few rods from the home of the Chewink, Rose-breasted Grosbeak, Indigo Bunting, and Scarlet Tanager; all these birds at the same time protesting against his invasion of their peaceful realm.

Further on in this favored woodland where the trees were scattered, but the underbrush dense, a pair of Mourning Warblers (*Geothlypis philadelphia*) were feeding their young; not far distant another pair had a nest full of fresh eggs concealed among the blackberry bushes and ferns beside a moss-covered log.

Near Springville the Hooded Warbler (*Sylvania mitrata*) was common. Nest and eggs of this species were taken here and at East Hamburg. The Black-throated Blue Warbler, Black-throated Green Warbler, Blackburnian Warbler, and Black and Yellow Warbler were all found in full-breeding dress and song. The nest and eggs of *Sylvania canadensis* were taken on the 5th of June; also a pair of the old birds and a young bird in full plumage the last of June, 1895.—ELAN HOWARD EATON, *Canadaigua, N. Y.*

Virginia Notes.—My notes of a visit to Southwestern Virginia in the spring of 1895—April 24 to May 9—contain three or four items which may be worthy of record.

Chondestes grammacus.—On April 28, at Pulaski, I found a bird of this species feeding in grass-land, where it allowed me to watch it at my pleasure. Dr. Rives reports a single Virginia specimen as having been taken in Washington, and in 'The Auk' for January, 1896, Mr. William Palmer records a second specimen taken in August, 1895.

Helminthophila chrysoptera.—Of the species Dr. Rives mentions a single Virginia specimen, taken near Washington by Dr. Fisher. At Pulaski, I saw four or more individuals April 28 to May 1. On my last morning there (May 1), in a hurried visit of a few minutes to the edge of the woods near the hotel, I found two Golden-wings among a bevy of new arrivals of different species. The Warbler migration was still only beginning, and I had then little doubt that a longer stay would show the species to be pretty common. All my birds were males.

Dendroica cærulea.—This species marked by Dr. Rives as "accidental or very rare," seemed to be moderately common at Natural Bridge, where it frequented exclusively the tops of hills covered with old deciduous forest. I saw it first on May 4. Two days later a female was seen gathering nest materials, but a long hunt failed to find the nest itself. The males sang with the utmost freedom. On May 6 I found them thus engaged on four hilltops.

It may be worth adding that Red Crossbills (*Loxia curvirostra minor*) were seen or heard on four dates at Pulaski and Natural Bridge, and that I found a flock of five birds feeding at Arlington, in the national cemetery, on May 12.—BRADFORD TORREY, *Wellesley Hills, Mass.*

On Birds reported as rare in Cook County, Ill.—*Porzana noveboracensis*.—In Ridgway's Birds of Illinois, this species is given as not uncommon, but from the observations of Mr. J. G. Parker and myself the Yellow Rail is a quite common resident of Cook County. I have had no

difficulty in taking or seeing a number each spring at South Chicago along the Calumet River, and at Worth, Illinois, on the Feeder of the Des Plaines River.

While Mr. Chas. Roby and myself were collecting on his grounds at South Chicago, in the spring of 1890, his dog caught two Yellow Rails in less than one hour's time, bringing them to us between his lips alive and with not a feather ruffled.

Macrorhamphus griseus. — I have found this bird in Cook County when the season has been a very dry one, the favorite feeding grounds being Mud Lake, a small lake one mile south of Grand Crossing, Ill., a small pond at 126th Street, South Chicago, along the Calumet River, and on the Sag, at Worth, Ill. The bulk arrive in the months of July and August after the breeding season is over, in company with flocks of Yellow-legs, Pectoral, Least, and Semipalmated Sandpipers. The Dowitchers generally fly in flocks of from three to ten, and as a rule are young birds.

I have two specimens in the rich red plumage that I shot at South Chicago, May 6, 1893. This is the only instance that I can find of this bird in Cook County, prior to July. In the Chicago Academy of Sciences are two birds in the light plumage taken at Mud Lake, Aug. 12, 1893. Mr. J. G. Parker, Jr., has frequently taken *M. griseus* at Mud Lake.

Macrorhamphus scolopaceus. — I have two specimens of this bird in the breeding plumage, which I bought from a market shooter at South Chicago, May 6, 1893, on the same day that I shot my specimens of *M. griseus*.

Micropalama himantopus. — I have observed a large number of this species, and can positively say that they are a rare spring migrant, and a common fall visitant. It is very hard to distinguish them in the fall plumage from the young of *Totanus flavipes*. I have one in the breeding plumage taken at South Chicago, on the Calumet River, in April, 1890; also one in the light plumage taken at Mud Lake, Sept. 23, 1893. Mr. J. G. Parker, Jr., has a bright female taken from a flock of four at Mud Lake, July 25, 1893; also a young bird from the same locality.

On August 24, 1895, Mr. J. F. Ferry, of Lake Forest, Ills., and myself shot four Stilt Sandpipers from a flock of fifty or more at Libertyville, Ill., a pair of which are in the collection of the Chicago Academy of Sciences.

Tringa maritima. — I have a specimen of this bird taken at South Chicago in June, 1895. This with Dr. J. W. Velie's specimen, taken November 7, 1891, are the only records I can find of the Purple Sandpiper in Cook County.

Tringa bairdii. — Mr. J. G. Parker, Jr., has one of these birds taken at Mud Lake, August 22, 1893.

Symphemia semipalmata. — Mr. J. G. Parker, Jr., and myself have seen this bird on several occasions in Cook County but have failed to shoot one.

Tryngites subruficollis. — In the spring of 1890 I shot one of these birds from a flock of Golden Plovers at Worth, Ill. The specimen is in

the Museum of the Cook County Normal School. There is also one bird in the Chicago Academy of Sciences which I shot at Mud Lake, Sept. 18, 1893.

Numenius longirostris. — I observed one of this species at South Chicago, Ill., in June, 1890. It was in company with the flock of *C. squatarola* from which I shot my specimens. I have one bird which I obtained at Liverpool, Ind., about fifteen miles from South Chicago. Mr. J. G. Parker, Jr., saw a pair of Long-billed Curlews feeding on the lake shore at Woodlawn Park.

Charadrius squatarola. — In June, 1890, I shot two fine old males in full breeding plumage, from a flock of about fifteen, at South Chicago, one of which is in the collection of the State at Springfield, Ill. I have a fine large bird in the young plumage from Mud Lake, Oct. 29, 1893. Mr. J. G. Parker, Jr., and myself observed three of this species at Hyde Lake, Ill., in November, 1891.

Arenaria interpres. — On a number of occasions I have seen this bird at South Chicago, the Sag at Worth, Ill., and at Mud Lake. I shot a fine specimen at the latter place, Sept. 18, 1893. Mr. J. G. Parker records one from the beach of Lake Michigan at Woodlawn Park. It was in company with a flock of Sanderlings.—FRANK M. WOODRUFF, *Academy of Sciences, Chicago, Ill.*

Additions to the Avifauna of Tennessee. — The following species not included in the annotated list of Tennessee birds recently published by me in the 'Proceedings' of the Academy of Natural Sciences,¹ have come to notice. They comprise some which have been recorded in other publications of a non-scientific or inaccessible character. Further additions to this list will be gratefully acknowledged and recorded by the author. I am indebted to Mr. H. C. Oberholser for some of these references.

1. *Larus delawarensis*. RING-BILLED GULL. — Numerous at Open Lake, Landesdale County, in November 1895, where Mr. B. C. Miles procured a specimen, sending me the head and foot for identification.

2. *Otocoris alpestris* subsp.? HORNED LARK. — A skin of this bird is recorded in the 'First Annual [1893] Report' of the Museum of the Illinois Wesleyan University, page 16. It evidently belonged to a collection of bird-skins presented to the University by Prof. G. S. Thompson, of Nashville, Tenn., as announced on page 5 of the report.

3. *Spizella monticola*. TREE SPARROW. — A specimen is recorded on page 17 of the above-mentioned 'Report' and it is probably from the same source as the preceding.

4. *Dendroica castanea*. BAY-BREASTED WARBLER. — This and the following two species were observed by Mr. Bradford Torrey near Chattanooga and recorded in the 'Atlantic Monthly.' His first record for the

¹ Contrib. Zool. Tenn., No. 2, Proc. A. N. S. 1895, pp. 463-501.

Bay-breast is from Lookout Mountain (l. c., 1895, p. 547) where he observed it May 7, 1895.

5. *Dendroica palmarum*. PALM WARBLER. — *Ibid.*, p. 547. Mr. Torrey considered the birds seen by him to be typical *palmarum*.

6. *Dendroica tigrina*. CAPE MAY WARBLER. — *Ibid.*, p. 547. Cameron Hill and Lookout Mountain.

7. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN. — A skin from Tennessee is in the Illinois Wesleyan University collection ('Report,' l. c., p. 19).

8. *Turdus aliciae*. GRAY-CHEEKED THRUSH. — Mr. Torrey saw this bird on Walden's Ridge in Hamilton County (l. c., p. 610). — SAMUEL N. RHOADS, *Philadelphia, Pa.*

Sundry Notes. — New London, Prince Edwards Island, Sept. 1, 1872. Mr. William Everett of Dorchester, Massachusetts, saw to-day a flock of about fifty Eskimo Curlew (*Numenius borealis*) which had that day landed in a field where a man was ploughing. This man informed him that they were very tame and had been following the furrows picking up and eating earth-worms. This Mr. Everett saw them do, after which he shot fifteen by walking up to them. On examination he found that all those shot were poor, having no fat.

Billingsgate, Cape Cod, Mass., April 27, 1895. Three Black-bellied Plovers, *C. squatarola*, the first this spring, noted to-day. On May 13, about one hundred seen all in one flock.

Mr. Frank Brown, of Chelsea, Mass., who sojourned at Charlotte Harbor, situated on the west coast of Florida, during the winter of 1888, informs me that there is in that neighborhood a small island on which are several dead trees, around the bases of which he noticed large heaps of good sized conch shells. Some of these heaps he should think were ten or twelve feet square. A portion of these shells appeared as if they had been there for years, while others were fresh looking. Inquiring of his boatman who was a resident of the place as to the cause, he was informed that the Eagles brought them there, pulled out the meat which they ate, dropping the shells.

Anas obscura. — Ponkapog Pond, Massachusetts, October 21, 1895. The first flock of migratory Black Ducks (eighteen in number) of the season came into the pond to-day, thirteen of which were killed. — GEORGE H. MACKAY, *Nantucket, Mass.*

CORRESPONDENCE.

Some Questions of Nomenclature.

EDITORS OF 'THE AUK':—

Dear Sirs,—Those of us who have to deal with fine points of scientific nomenclature will always be duly thankful to the A. O. U. Committee on Nomenclature for the 'Code' which was the result of their first labors, and which has now become the standard not only of our ornithologists and mammalogists but of most other American zoölogists and botanists as well.

Occasionally, however, knotty questions present themselves for which we find no ruling in the Code, and each author is compelled to decide for himself, which results in great diversity of opinion. On some of these questions a careful study of the 'Check-List' shows that the A. O. U. Committee did form their decision, but unfortunately did not include the reasons therefor in the Code, nor give us any of the arguments in the case.

I therefore wish to call especial attention to one or two points in the hope that we may come to a little more definite understanding of them and perhaps elicit an explanation from the A. O. U. Committee giving the reasons for their rulings.

The first question is in regard to the quotation of authorities for manuscript names.

For instance, an author, Smith, discovers a new bird for which he proposes a name and prepares a description, then finding that another author, Jones, is about to publish a paper on allied birds, he sends his manuscript for Jones to incorporate in his paper. Or perhaps Smith merely sends a specimen bearing the new name which he would propose and calls attention to its most distinctive characters, leaving Jones to prepare the description in his own words. In either case Jones gives Smith credit for the new species by placing his name after the scientific name as authority for it. Now the question is, are we in quoting the name to cite Smith, the *author* of the species, or Jones the publisher of it, as our authority.

Those who would quote Jones claim that the first one to publish a diagnosis of the species is the author to be quoted, because until the description is published the name is a *nomen nudum*, and that the author of the manuscript name is not authority for the description published by the other. Furthermore, by quoting the author of the MS. name we give no clue to the place of publication, which is one of the principal reasons for quoting an authority.

On the other hand, it is claimed that we have no right to ignore the author of the MS. name, as he really recognized the species as new and deserves the 'credit'; moreover, the author who published the description

(Jones) distinctly disclaimed credit for the species by quoting 'Smith' along with the scientific name at the head of the description.

The mere question of 'credit' is of but little importance to my mind, for more real 'credit' belongs to the man who prepares a good monograph of a group whether he hands his name down to posterity as a sort of caudal appendage to a lot of new species or not. A form warranting description should be described by all means, but this is not the end of zoölogical science, as some seekers after new species seem to think.

If both sides were consistent in the above argument we might decide in favor of one or the other, but they are not.

So far as my experience goes representatives of both sides recognize two classes of MS. names. (1) In which Smith prepares the entire diagnosis as well as proposes the name and Jones prints the whole bodily in his paper. (2) Where Smith has merely attached his new name to a specimen and called attention to some of its characters, leaving Jones to prepare the diagnosis.

In case (2) the advocates of the publisher as the authority to be cited quote Jones, but in case (1) I find most of them would quote Smith.

Now for my part I fail to see how we can in practice draw a line between these two classes of MS. names, and how we are to tell which author had the most to do with framing a description.

Moreover, inclined though I am to the citing of the publisher of the name, I do not think that the MS. author can be wholly ignored where all the work is his and where the publisher has merely acted as editor for him, and distinctly disowns the species as his own. Such action would cause the greatest overthrow of authorities in invertebrate zoölogy where MS. names are much more frequent.

The clearest way out of the difficulty seems to me to be the quotation of both authors in all cases thus: "Smith" Jones,¹ which indicates exactly the status of the authority and is very little more trouble to write. This practice, too, will be much more likely to be generally adopted than the citation of either name separately, especially in view of the great diversity of opinion which now exists among zoölogists in general.

The action of the A. O. U. Committee in regard to this question is interesting and further illustrates the diversity of opinion, at the same time showing how unstable the authorities quoted in our list are likely to be. In the first edition of the Check-List there are some twenty instances of 'MS.' names; in four of these the Committee decided to adopt as authority the name of the author who published the description, while in all the rest they ruled in favor of the author of the MS. name. The latter seemed to be their general rule while the first four cases were regarded as pure *nomina nuda* before the descriptions appeared. In some

¹ I do not claim any originality in suggesting this form of citation, as I am well aware that it has been often used. I merely advocate this form as preferable to either name separately or to such a form as, Smith MS. Jones.

of the latter, however (especially *Rallus saturatus* "Hensh."), it is hard to see where the author of the MS. name had any claim over those of the first four cases.

In the Supplements to the Check-List the Committee continued to rule in favor of the author of the MS. name, but in the new edition which has just appeared they reversed their ruling, changing the authorities for a number of names, and have almost universally ignored the MS. author and quoted the publisher.¹ In two instances, however, the 'MS. author' still receives recognition, *e. g.*, *Pipilo chlorurus* (Townsend) and *Otocoris alpestris pallida* Townsend.

The first of these is described as *Fringilla chlorura* in Audubon's Orn. Biog., V, p. 336. The entire description is a quotation from a letter of Dr. J. K. Townsend, but the name is not credited to him and is not in quotation marks: it is clearly Audubon's and without it the description would have no status. Ord, in Guthrie's 'Geography,' gave names to descriptions in the History of Lewis and Clarke's Expedition, and we do not quote Lewis and Clarke; so far as I see the two cases are parallel.

Otocoris alpestris pallida was discovered, described and named by Mr. C. H. Townsend, and I presume his manuscript was in the U. S. Government Printing Office early in 1890, or perhaps before. However, Mr. Townsend lent his type to Dr. Dwight when he was preparing his monograph of the American Horned Larks, and another description was prepared and printed in Dr. Dwight's paper (Auk, April, 1890, p. 154).

Mr. Townsend's description did not appear till September, 1890 (judging from the date on which the paper was distributed). Dr. Dwight very properly disclaimed any credit for the name and gave it as "Townsend MS.," and in the A. O. U. Check-List it is credited to Townsend.

The reference, moreover, is that of Townsend's publication (Proc. U. S. Nat. Mus., 1890, p. 138), and Dr. Dwight's apparently earlier publication is ignored. While I do not begrudge Mr. Townsend his Lark, and would still give him full credit for it on the plan advocated above, I fail to see why the Committee should make this special ruling.

While discussing the rulings in the new Check-List I would like to call attention to one or two instances which I take to be typographical errors, though perhaps there may be some reasons for them that I have overlooked.

No. 13a. *Fratercula arctica glacialis* (Temm.) is printed identically in the two editions, but the reference to Temmink's work is omitted in the new edition, and Stephens, Gen. Zoöl. 1826, given as the place of original publication; should not the authority be changed to Stephens?

An exactly similar case is 766a. *Sialia sialis azurea*, still credited to "Swains.," though the place of original publication is changed to "Baird, Rev. Am. B., July, 1884, p. 62," and no reference to Swainson appears.

¹This makes Gambel the authority for *Callipepla gambelii* or indicates that he named the bird after himself, which he certainly did not intend to do!

Another point is in regard to quoting the authority for species described in the 'Fauna Boreali-Americana.'

The A. O. U. Committee has evidently decided to quote the author whose initials appear at the head of the description immediately following the scientific name instead of the two authors jointly. *Oidemia americana*, however, is still credited to "Sw. and Rich.," although it is Swainson's species and no reference to Richardson occurs in connection with it. Two other species, *Lagopus leucurus* and *Larus franklinii*, credited to "Sw. and Rich.," are still regarded as of joint authorship though both could easily be credited to Richardson without stretching rulings applied in other cases.

The other main point to which I wish to call attention is one of priority. Two names are proposed in the same volume for the same animal, one having priority of nineteen pages. Several specialists claim that in such a case the next writer to revise the group to which the animal belongs has the right to adopt either name he chooses, and subsequent writers should follow him. I should like to know if such a ruling is in accordance with views of the A. O. U. Committee. To me the priority of a few pages seems to warrant the adoption of the first name just as much as priority of a few years, or, as it has been happily put, "in case of twins, primogeniture rules."

I was impelled to call especial attention to the main points discussed in this letter by the question of the proper name for the Polar Hare recently agitated by Mr. S. N. Rhoads (see Amer. Nat., 1896, p. 251), and I am indebted to this gentleman for the use of some letters from specialists bearing upon the matter.¹

The citation of this case, with the opinions of various specialists, will further illustrate the different views that are held in regard to these questions. Ross published a description of the Polar Hare in his 'Voyage,' Appendix IV, p. 151, giving it the name "*Lepus arcticus* Leach," implying that Dr. Leach had recognized the species as new and had proposed this name for it. Farther on in Appendix No. IV is a more minute account by Dr. Leach of the animals collected; here (p. 170) he describes the Polar Hare, giving it the name *Lepus glacialis*, having apparently changed his mind as to what he would call it since communicating with Ross.

Sabine, Baird and others chose to adopt *Lepus glacialis* Leach for the animal, but now Mr. Rhoads advocates *Lepus arcticus* on account of priority and would quote as authority "Leach" Ross in accordance with the suggestion given above in this letter.

In answer to inquiries the following gentlemen have given their opinions as below in regard to which name and authority they would quote.

¹ The permission to publish their opinions was courteously granted by the gentlemen mentioned below, to whom I am also indebted.

Lepus arcticus Ross.

Dr. L. Stejneger.

Dr. T. S. Palmer.

Lepus glacialis Leach.

Dr. C. Hart Merriam.

Mr. Gerrit S. Miller, Jr.

Lepus arcticus Leach, Ross.

Dr. Theo. Gill.

Lepus arcticus "Leach" Ross.

Prof. H. A. Pilsbry.

Mr. S. N. Rhoads.

Mr. Witmer Stone.

If only one authority is to be quoted Dr. Gill and Prof. Pilsbry would adopt *Lepus arcticus* Leach, and Mr. Miller, if deciding the case first hand (without regard to Baird, Sabine, etc.), would adopt *Lepus arcticus* Ross.

Finally, I must apologize for using so much of your valuable space, but feel that these questions should be brought into prominent notice, for while they do not appeal to the field ornithologist, they must have presented themselves to every systematist who has had occasion to discuss points of nomenclature.

Very truly yours,

WITMER STONE.

Acad. Nat. Sciences, Phila.,

March 3, 1896.

[Mr. Stone, in a private letter accompanying the above, has kindly suggested my following his communication with such remarks as may seem to me pertinent. In doing so I wish to be understood as writing for myself alone and not in behalf of or by the authority of the A. O. Committee on Nomenclature, although what I say in reference to the points raised by Mr. Stone is, I believe, strictly in line with the decisions of the Committee.

First in regard to MS. names, or Mr. Stone's 'Smith and Jones' case. As Mr. Stone has shown, there are two well-defined classes of manuscript names. There are also cases which do not clearly come under either.

1. Under class 1 we may place (a) names borne on the label of a museum specimen, or (b) transmitted by means of a labelled specimen from one naturalist to another. Out of courtesy, or for some other reason no more obligatory, Jones, the publishing author, adopts Smith's name and writes after it 'Smith MS.' In this case Jones is the authority for the name, and Smith gets his 'credit' for his discovery, which will appear to the end of time in every full citation of the bibliography of the species.

The justness of this is easily demonstrated. Jones is the responsible party in the case. He is the arbiter as to whether Smith's supposed new species is really tenable. In case he finds it a 'good species' he is at

liberty to adopt Smith's name or not, as he chooses. If he finds Smith's species is not a 'good species' it is his duty to suppress it altogether, thus doing Smith the kindness of concealing his mistake, and benefiting science by suppressing a synonym.

2. Under class 2 we may place MS. names, transmitted from one naturalist to another, accompanied with a diagnosis. Jones, the publishing author, receives from Smith not only a labelled specimen, but a diagnosis of the new species it is supposed to represent. Jones publishes the name and the diagnosis as inedited matter, credited to Smith, with such additional comment as he sees fit, endorsing or discrediting the species as his judgment may dictate. In this case Smith is the author and Jones merely the vehicle of publication, and the citation will be "Smith, in Jones, etc." (= title of the publication). Or, as sometimes happens, instead of transmitting specimens, Smith may send merely the name and diagnosis for incorporation in Jones's monograph; in which case, or in either case, Jones's responsibility for Smith's species extends only so far as relates to his good judgment in accepting Smith's matter for publication.

On this supposition, Jones publishes Smith's diagnosis as well as his name, and both in such a way as to indicate Smith's authorship. Should Jones fail to do this, and their is nothing to show Smith's claim, we can recognize only the ostensible author; the equity of the case is purely a personal matter between Smith and Jones.

In certain cases one may have reason to suppose that the author of the MS. name furnished something more than a MS. name attached to a specimen,—in fact in rare instances many know this to be the case: but it would be fatal to stability in the matter of authorities for names if we allowed such knowledge or conviction to supercede what the record shows on its face, since this alone is the evidence open equally to every one.

All cases of MS. names should be placed under one or the other of the two classes already defined, but the decision may be less easy in some cases than in others. An instance in point is the case of "*Fringilla chlorura* Towns., in Aud. Orn. Biog.," etc., cited above by Mr. Stone. It is evident that all Audubon knew of the bird was derived from the account furnished him in a letter by Mr. Townsend; the whole account, except the name, is given as a quotation from Townsend. Townsend may have given it the name also, but of this there is no proof. The name as it stands is ostensibly Audubon's. Yet all subsequent writers have attributed it to Townsend, and apparently the A. O. U. Committee followed custom without subjecting the case to special scrutiny. Now that my attention is specially drawn to it, I see no way of escaping the decision that, in strict accordance with the rule applied in other cases in the revised edition of the Check-List, the name is Audubon's, and the citation should be *Fringilla chlorura* Audubon.

In the case of "*Otocoris alpestris pallida* Townsend," it seems unavoidable to accept Mr. Stone's correction, as Dr. Dwight's paper was published

about April 1, 1890, and Mr. Townsend's, as shown by the official list of dates of publication of the articles in Vol. XIII of the Proceedings of the U. S. National Museum (see p. viii of this volume), not until Sept. 9, 1890. Yet Dr. Dwight says Mr. Townsend "has recently described a race from Lower California and kindly permitted me to examine his type," being under the impression, doubtless, that Mr. Townsend's paper was already in press. The facts in the case as now developed render it evident that the correct citation is: *Otocoris alpestris pallida* Dwight (ex Townsend MS.), Auk, VII, April, 1890, p. 154.

In the first edition of the A. O. U. Check-List, as Mr. Stone has pointed out, there was lack of uniformity in the treatment of MS. names, as also in a few other nomenclatural matters, defects it was sought to remedy in the second edition; but, as in all things of human origin, there is lack of perfection even in the revised edition, but the inconsistencies are few and wholly accidental.

The case of "*Fratercula arctica glacialis* (Temm.)," as it appears in the revised edition, is a puzzle. Obviously if the amended reference is correct, "Stephens" should replace "Temm.," as the authority for the name *glacialis*. On reinvestigation, however, it turns out that the change introduced in the revised edition was uncalled for and erroneous, the original edition being correct.¹

As regards "*Sialia azurea* Swain.," the name as used by Swainson "is a complete *nomen nudum*" (cf. Ridgw., Man. N. Am. Birds, p. 581, first footnote), and was first coupled with a description by Baird in 1864. Therefore the authority is Baird and not Swainson.

In regard to the 'Fauna Boreali-Americana,' it was the ruling of the Committee that the author of the species, whether Swainson or Richardson, or the two authors jointly, should be cited as the authority for the name, each case to be determined on its merits by the evidence afforded by the text. But the evidence is not always clear, so that different authorities might decide the same case differently. In the case of new species either Richardson's or Swainson's name is usually given as the authority. In the case of *Lagopus leucurus*, "Swains." is given as the authority for the name, but the description is signed "R." So it was deemed proper to cite both Swainson and Richardson as the authority.

The authority for *Larus franklinii* is "nobis"; the text is signed "R."

¹ Temminck says: "On doit observer de ne pas confondre notre *Mormon fratercula* [= *Fratercula arctica* (Linn.)] avec une espèce propre aux côtes septentrionales d'Amerique, dont le plumage est absolument semblable, mais qui a la bec beaucoup plus haut, elle a surtout la mandibule inférieure très-arquée; cette espèce nouvelle est indiquée par le docteur Leach, sous le nom de *Mormon glacialis*" (Man. d'Orn. sec. éd., II, 1820, p. 933). On reference to Stephens it becomes evident that Dr. Leach's name was merely a museum manuscript name, whence both Temminck and Stephens obtained it.

but one of the footnotes is signed "Sw.," and the diagnosis is not signed (as it is in some other cases, but not in all).

In the case of "*Oidemia americana* Sw. and Rich.," the proper authority is obviously Swainson, and that it was not so printed in the revised Check-List is clearly due to oversight.

In regard to the priority of names published in the same volume, Mr. Stone will find this point treated under Canon XVII of the A. O. U. Code, to the effect that of names of equal pertinency, "that is to be preferred which stands first in the book."

As to the case of *Lepus arcticus*, I should agree with Mr. Rhoads and write *Lepus arcticus* Ross, or, in making a full or formal citation, *Lepus arcticus* "Leach" Ross. *Lepus glacialis* is clearly untenable, *arcticus* having precedence of 19 pages in the same volume. Even if Leach imparted the name *arcticus* to Ross, he had no right to change it later on the ground that he preferred *glacialis*, since "an author has no right to change or reject names of his own proposing, except in accordance with rules of nomenclature governing all naturalists" (cf. A. O. U. Code, Canon XXXV). The case of *Lepus arcticus* Ross, therefore, rests entirely on the adequacy of Ross's accompanying description, which, if sufficient (I have not the description at hand), clearly renders the name *glacialis* untenable.¹—J. A. ALLEN.]

A Question of Nomenclature.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs,—The publication by Mr. Anthony, in the January number of 'The Auk,' of a new subspecies of *Dryobates*, under the appellation *Dryobates villosus montanus*, involves a principle of nomenclature in regard to which it may be profitable to invite the opinions of systematists, and upon which a decision by the A. O. U. Committee seems desirable.

Picus montanus of Brehm (Vögel Deutschlands, 1831, p. 189) is now relegated to the synonymy of *Dendrocopos* (= *Dryobates*) *major* (Linn.); and the question arises whether or not the specific term *montanus* is available for further employment in the genus *Dryobates*. Canon XXXIII of the A. O. U. Code, which is presumed to provide for such contingencies reads: "... a specific or subspecific name is to be changed when it has been applied to some other species of the same genus, or used previ-

¹ Professor Baird (Mam. N. Am., 1857, p. —) says he does not see why the name *arcticus* Ross is not tenable, having priority, but not being able to consult the work in question he follows Sabine in the use of *glacialis* Leach. I find that in 1877, with the work before me, I gave precedence to *arcticus* Ross.

ously in combination with the same generic name." If the first clause above quoted be not subject to ambiguous interpretation, it seems evident that a new name will be required for the form now known as *Dryobates villosus montanus* Anthony.

Since, however, it is maintained by some that absolute identity of both generic and specific terms is considered necessary for the rejection of a scientific name as a synonym, in other words, that a distinction is to be made between the genus of nomenclature and the genus of zoölogy, it is hoped that there may be elicited from members of the A. O. U. Committee statements of their views respecting the rule to be applied in cases like the present.

Very truly yours,

HARRY C. OBERHOLSER.

Washington, D. C.

[Mr. Oberholser having kindly invited me to give my opinion on the above case, I take the liberty of submitting the following, as merely my individual ruling on the question.

According to my interpretation of Canon XXXIII of the A. O. U. 'Code,' there is no conflict between Anthony's name *Dryobates villosus montanus* and Brehm's *Picus montanus*, for the simple reason that they are not homonyms. A species name necessarily consists of two elements, a generic and a specific, both being essential components of the name. This is explicitly stated in Canon X of the A. O. U. Code, which affirms that the two names, the specific and the generic, "together" constitute the "technical name of any specifically distinct organism." That this view was in the mind of the Committee in framing Canon XXXIII is evident from the argument and illustrations given under it in favor of extending the maxim "Once a synonym [or homonym] always a synonym [or homonym]" to specific and subspecific names.

To pursue further the case cited by Mr. Oberholser, *Picus montanus* Brehm is a pure synonym of *Picus major* Linn., and the name *montanus* had never been coupled with *Dryobates* prior to Mr. Anthony's combination of the two terms,—that is, so far as we know, and for the sake of the illustration, let it be granted that they have not. These names are then not homonyms, and can never come in conflict. But let us suppose that *Picus montanus* Brehm really represents a good species, authors hitherto to the contrary notwithstanding, and that it is referable to the genus *Dryobates*. In that case whoever restores the species must adopt for it the name *Dryobates montanus* (Brehm), and Anthony's name, having been given later, must be replaced by a new name; but the change is not to be made until the necessity therefor arises. In nine cases out of ten, like this of Anthony and Brehm, it is safe to say the necessity for a change would never arise. Hence it would be highly unwise to adopt a rule, in view of the constantly changing limits and values of genera, that would

require the specific element of a species name to be changed whenever, under the vicissitudes of name shifting, it was brought under the same generic name as an earlier similar specific element of a species name which had never been combined with the same generic element. To be obliged to be constantly on the alert for homonyms is bad enough, but this is a triviality in comparison to the task of hunting out all previous combinations that might possibly associate the specific element of a name with other and entirely different generic combinations, to say nothing of the enormous element of uncertainty it would introduce into the matter of stability of names through the purely personal element that is constantly operative in changing the limits of genera. Finally, I know of no code of nomenclature that provides for or requires a change of a species name under conditions like those cited by Mr. Oberholser.—
J. A. ALLEN.]

‘Ord’s Zoölogy’ Again.

TO THE EDITORS OF ‘THE AUK’:—

Dear Sirs,—In the Introduction to my Reprint of ‘Ord’s Zoölogy’ (1894, p. viii) it is stated that the only copy of this part of the second American (1815) edition of Guthrie’s ‘Geography’ previously known to authors had mysteriously disappeared from the library of the Academy of Natural Sciences of Philadelphia. While searching for some references in a bound volume (No. 1*a*) of General Natural History Tracts at the Academy, I lately chanced upon this missing copy of a rare and historic bit of literature. The separate is the last (No. xvii) of this volume of Tracts. On the upper margin of the first page of the brochure (p. 291) is written in lead pencil the autograph signature, “George Ord,” and in lead pencil, apparently in another person’s¹ writing, “from Guthrie’s Geography, Phil. Edition.” In ink, in Cassin’s hand, follow the words, “Guthrie Geog. Philada. 1815.” The separate probably had originally attached to it, page 290, containing the introductory paragraph, and the last leaf containing page 261, on which Ord’s contribution ends, but neither of these leaves are preserved. Owing to some oversight the “author’s” reference to this tract in our card catalogue contained no data to indicate anything further than its former existence in the library, and misled by this, it was supposed, after a fruitless search, that it had been irretrievably lost. On finding the tract, however, it was discovered that the full reference and data had been entered in the ‘subject’ catalogue under “Natural History of the United States” and so it escaped notice.

¹ Dr. E. J. Nolan declares this to be the handwriting of John Cassin, and a careful comparison with Cassin’s letters strongly supports this view.

It is due the librarian of the Academy to state that the irregularity in cataloguing resulted naturally from the absence of Ord's name on the separate as the authoritative author and to the fact that the main page heading of the tract reads "United States of America."

SAMUEL N. RHOADS.

Acad. Nat. Sci. Phila.

March 3, 1896.

Chen hyperborea and *C. nivalis*.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs,—I am desirous of ascertaining the status of *Chen hyperborea et nivalis* east of the Mississippi River, and therefore request that all members of the Union and readers of 'The Auk' that have specimens of these forms in their collections from the territory in question will favor me with the following data: locality where taken, date, sex and measurement,—length and wing.

WILLIAM DUTCHER.

525 *Manhattan Ave.*,

New York City.

NOTES AND NEWS.

DR. WILLARD LORRAINE MARIS, an Associate Member of the American Ornithologists' Union, died at the German Hospital in Philadelphia, December 11, 1895. Dr. Maris was a graduate of the University of Michigan, and shortly before his death, from typhoid fever and pneumonia, was appointed resident physician at the hospital where he died. He was a young man of fine education and exceptional abilities, and was much interested in natural history, devoting special attention to ornithology. He was a son of Prof. L. Maris of Newtown, Bucks County, Pennsylvania.

THE DELAWARE VALLEY ORNITHOLOGICAL CLUB held its annual meeting at the Academy of Natural Sciences, Philadelphia, on January 2, 1896. The annual reports showed a continuance of the prosperous condition of the Club as reported last year, while the membership list shows a decided increase. Among the communications of the past year

may be mentioned the following: 'Food Birds of the Eskimo,' Dr. Wm. E. Hughes; 'Summer Birds of the Pennsylvania Coal Region,' R. T. Young; 'Nesting Habits of the Parula Warbler in Cape May Co., N. J.,' M. L. C. Wild; 'Ornithological Notes from the Diary of William Bartram,' Witmer Stone; 'Birds of Tennessee,' S. N. Rhoads; 'Winter Birds of Cape Charles, Va.,' G. S. Morris; 'Some Notes on the Extermination of the Wild Pigeon,' Wm. L. Baily.

The officers of the Club for the ensuing year are President, Dr. Wm. E. Hughes; Vice-President, I. Norris De Haven; Secretary, Charles J. Rhoads; Treasurer, Wm. L. Baily.

THE MICHIGAN ORNITHOLOGICAL CLUB held three meetings during the last quarter. January 12, Mr. A. B. Durfee read an interesting paper on the Short-billed Marsh Wren (*Cistothorus stellaris*), based on nearly half a century's experience; and Mr. W. E. Mulliken presented a paper on Evolution. February 14, Mr. L. J. Cole read a paper entitled 'Winter Experiences,' and Mr. Mulliken gave a talk on Migration. March 13 Mr. T. L. Hankinson presented a paper entitled 'Winter Notes,' and Mr. H. F. Jones a paper on the Prairie Horned Lark. A neatly printed Constitution has been issued and a copy sent to all observers in the State. At the meeting of February 14, a committee composed of L. Whitney Watkins, W. Earle Mulliken, and Thos. L. Hankinson, was appointed to prepare a migration schedule and to take up the study of bird migrations in Michigan. The blanks (similar to those used by the Department of Agriculture) have been printed and a copy sent to every observer in the State or near its borders. The membership of the Club now numbers forty, and is evenly distributed over the State. Persons interested in the work of the Club should address the Secretary, W. Earle Mulliken, at 191 First Ave., Grand Rapids, Mich., for particulars.

THE publishers, the J. B. Lippincott Company of Philadelphia, announce a "second edition, thoroughly revised," of Mr. Ridgway's 'Manual of North American Birds.' The prospectus states that this new edition of the 'Manual' "has been carefully revised to the close of 1895, and includes the characters of over one hundred species and six genera which have been added to the North American fauna since 1887. Various errors in the first edition have been corrected, several of the analytical keys having been entirely rewritten." Directions are given for the use of the keys, and marginal references in the body of the work refer to the additional matter in the appendix.

D. APPLETON AND COMPANY of New York have brought out a third edition of Mr. Chapman's 'Handbook of Birds of Eastern North America.' A few errors that escaped rectification in the second edition are here corrected, but no essential changes are introduced.

WE HAVE received Vol. I, No. 4, Jan. 1896, of 'The Feather,' a monthly journal devoted to "Poultry, Pigeons, Birds, etc.," published by George E. Howard & Co., Washington, D. C. It has a department devoted to "Cage Birds and Wild Birds," conducted by Dr. F. H. Knowlton of the U. S. National Museum. The January issue contains several pages of ornithological miscellany, contributed by Dr. Knowlton, including an article on 'The Great Auk, an Extinct Bird of much Renown,' illustrated with cuts of the bird, its skeleton, and its egg.

IN AN article in 'Nature' (Feb. 20, 1896), Dr. R. Bowdler Sharpe gives an account of 'The Seebohm Collection' of birds received by the British Museum as a bequest from the late Mr. Henry Seebohm. Incidentally Dr. Sharpe sketches the growth of the Ornithological Department of the British Museum during the last twenty-five years, from a collection of about 40,000 specimens to its present status of the "finest in the whole world." The principal accessions are enumerated, and their distinctive features stated. These are the Wallace, Gould, Sclater, Shelley, and Sharpe collections; the magnificent Hume collection; the Tweeddale collection; and the great Salvin-Godman American collection. Nearly all have been donations from their former public-spirited and distinguished owners. 'Until the reception of the Seebohm collection, the birds of Europe and northern Asia were poorly represented. "By the splendid bequest of Mr. Seebohm," says Mr. Sharpe, "this vacuum in our Palearctic collections has been filled, though there is no one in the Museum who does not feel that this addition to the strength of its ornithological section has been attained only through the loss of one of the truest friends of the institution which his dying wishes have enriched. There has not yet been time to register and incorporate the specimens of the Seebohm collection, but we know that we have now received the principal collection of Palearctic birds of modern times." Some years since Mr. Seebohm presented to the British Museum his collection of eggs. This latest gift includes "the Swinhoe collection of Chinese birds, the Prior collection of Japanese birds, the series of specimens obtained by Holst in the Bonin and Loo-Choo Islands, and Formosa; and last but not least, his own European and Siberian collections, the result of his travels in all parts of Europe, and of his expeditions to the valleys of the Petchora and the Yenesei." Also his great collections of Charadriidæ and Thrushes, the former the basis of his work on the 'Geographical Distribution of the Charadriidæ,' the latter of his contemplated 'Monograph of the Turdidæ, or Family of Thrushes.' It is certainly pleasant to know that the ornithological treasures accumulated by Mr. Seebohm have been deposited where they will be not only duly appreciated but will contribute so effectively to the progress of ornithological research.

THE FIELD COLUMBIAN MUSEUM has sent a Natural History Expedition into Central Africa, under the leadership of the Curator of Zoölogy, Mr. D. G. Elliot. Mr. Elliot sailed from New York about the last of February, and the details of his plans -- the particular part of the country to be visited, etc. -- were to be determined by information and advice obtained in London. As he takes with him the skilled taxidermist collector, Mr. E. Akeley, as his chief assistant, and is well provided with funds and necessary equipments, it may be naturally expected that the expedition will secure an ample harvest. Mr. Elliot will make special efforts to secure as many species of the Antelopes, many of which are rapidly nearing extinction, and other large South African mammals; not neglecting of course to gather in ornithological material when possible to obtain it. Mr. Elliot expects to remain in the field till December.

MR. FRANK M. CHAPMAN is spending a two months' vacation in Yucatan, where he finds that the ancient Aztec ruins rival in interest the mammals and birds.

As this page goes to press several ornithological publications have come to hand, some of which it seems desirable to mention. We have received, for instance, Part XIII of Mr. Nehrling's 'Birds of North America.' Also Mr. Cory's 'Hunting and Fishing in Florida' which should have plenty of interest for both the sportsman and naturalist, and particularly the ornithologist, as the latter half is devoted to a formal account of the Water Birds of Florida and very fully illustrated with cuts prepared especially for the work.



EVERMANN'S PTARMIGAN (*LAGOPUS EVERMANNI*)

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XIII.

JULY, 1896.

NO. 3.

THE DUCKS OF PLYMOUTH COUNTY, MASSACHU-
SETTS.

BY HERBERT K. JOB.

WHATEVER may be the claims of other sections of New England, it is certain that Plymouth County, Mass., especially the southern half, is notably a favorite resort of the Ducks. Every one of the twenty-eight species attributed to New England has been noted within the last ten years.

The topographical conditions are specially favorable for their occurrence and capture. The county has an extended and varied coast-line, with good feeding grounds. Of the latter there are two specially notable,—Plymouth Bay on the east, and Buzzard's Bay on the south. Another minor feeding ground is in the southwest corner of Cape Cod Bay, where the townships of Plymouth and Bourne adjoin,—the South Plymouth resort. A few miles south of Plymouth Bay is a projection called Manomet Point, one of the finest spots for sea shooting on the whole New England coast. Vast hordes of ducks go by here in the autumn into Cape Cod Bay. The number is less in the spring, as the greater body, flying north, is deflected seaward by the convex side of Cape Cod, while in the flight south they suddenly find themselves hemmed in by the up-curving arm of the Cape.

Inquiry is often made as to the further course of those fowl that fly into this great bay from the north. I am unable at present to say how many of them follow the curve of the Cape back around Provincetown. But I know that a great many do *not* go around, but fly over the peninsula, notably at the narrows adjoining Buzzard's Bay, at Barnstable, and at Orleans into Chatham Bay. On clear days and moonlight nights they fly high, but it is otherwise in thick or stormy weather, when they are shot in transit from elevated spots, such as 'Shoot-flying Hill,' West Barnstable. In the spring flight many that do not go around the Cape enter Buzzard's Bay, and, crossing at the 'Narrows,' fly up the Plymouth shore past Manomet.

On the coast the autumn flight is observed to begin the last of August with the Scoters, the tide of migration increasing gradually to its height, which is from about October 20 to early November. By the last of the month the migration is about over. In the spring the return movement is noted by the last of March, the period of greatest abundance being early April, perhaps from the 5th to the 10th. The several Scoters are the last of the Fuliginæ, lingering into May, sometimes collecting in great 'beds' to feed protractedly. Such a case was noted off Plymouth Harbor, April and May, 1894, when several thousand Scoters were estimated to be feeding on those flats.

Some account must now be given of the fresh water resorts. Southern Plymouth County is well termed the 'Lake Region of Massachusetts.' It is full of ponds, and is drained mainly by the Taunton River and its tributaries. The largest bodies of fresh water in the State are found here. Assowompsett Pond, the greatest in area, is a broad oval sheet, shallow, three miles long by two across. The next is Long Pond, close by, four miles long by over a mile in width. These and a number of others comprise a distinct group, known as the Lakeville Ponds. Eastward, in the southern part of old Plymouth town, a region of veritable wilderness, is another large group. Then, north and west, in Kingston, Halifax and vicinity, is still another group, the largest being Monponsett Pond and Silver Lake, the latter a noted spot for shooting geese. Many of the Fuliginæ daily enter these ponds lying near the coast to obtain fresh water and to feed.

Last, but not least, apart from others of considerable size, in the town of Bridgewater, is Nippenickett Pond, about two miles long, shallow, irregular, excellent feeding ground, and in every way adapted to the purposes of the 'stand gunner.' One stand secured over 200 ducks in the autumn of 1895. Ducks of at least twenty species are taken here nearly every year. I am much indebted to Mr. J. E. Bassett, who owns the above stand, a careful and intelligent observer of the water-fowl, for statistics of the occurrence of the various ducks in this pond, and for many fine specimens in the flesh. From the abundance of ducks in this pond, it might be surmised that it is located in some special highway of migration, perhaps from Boston to Narragansett Bays, it being nearly in the direct line.

The influx of ducks in these ponds begins about the middle of September with the Dusky Duck, and continues until the ice forms, the whole of October being a period especially fruitful. Many of the Fuligininæ frequent the ponds during the last half of the season. Large numbers of ducks pass over on clear nights, often without stopping. On clear, cold days, with heavy northwest wind, especially in October, great numbers of the various Anatinæ keep passing in large flocks.

In the spring flight very little is seen of the Anatinæ. They evidently pass much more quickly than in autumn, as well as more inland. Moreover, as they are not then decoyed and shot, to any extent, it is next to impossible to observe them, flying as they do by night, and being so exceedingly shy.

A brief résumé of the different species and their occurrence will now be in order.

Of all the Anatinæ, the Dusky Duck (*Anas obscura*) is by far the most abundant. A number linger in winter on the coast. Many of these late birds, probably a northern race, are very large and finely plumaged, with deep red tarsi, and are popularly regarded as a distinct species. Quite a few remain to breed in the meadows and swamps adjoining the Taunton River and some of the ponds.

The Wood Duck (*Aix sponsa*) is, of course, very abundant, frequenting the streams and smaller ponds, breeding in suitable localities.

Probably the Pintail (*Dafila acuta*) is next in abundance among the Anatinæ. It is quite a common bird in autumn in the ponds, coming often in flocks as large as forty. Most are in immature plumage. The main flight is from the last of September to the middle of October.

Aside from the Blue-winged Teal, I would rank the Mallard (*Anas boschas*) next in comparative abundance. It is a much commoner bird in this section than is generally known. It regularly visits all the larger ponds, mostly in small bunches, or stragglers with flocks of the Dusky Duck, yet not infrequently in good sized flocks. The only exact figures of its capture to which I can refer are from Mr. Bassett, at Nippenickett. This year the stand took eight, singles or from small bunches, seeing a number more that escaped, and also a flock of twelve that would not decoy, but were accurately observed through field glasses. In 1894 nine were taken, and in the autumn of 1893 about twenty, when they were unusually abundant. Mr. C. C. Wood, the Superintendent of the Plymouth Rock Trout Company, a taxidermist and collector, who has had long experience with the ducks in the Plymouth ponds, regards the Mallard as "a common straggler," occurring every fall. In general, it is a regular and by no means uncommon species.

The American Widgeon (*Mareca americana*) occurs much as does the Mallard, though perhaps rather less commonly. For the past three autumns it has been much scarcer than usual, yet even then it appeared in small numbers in most of the ponds. Mr. Bassett has not infrequently shot into flocks of as many as twenty. Mr. Wood has, until within three years, found single ones in flocks of the Dusky Duck. He has noted no large flocks in the Plymouth ponds, such as are seen in Nippenickett.

Both species of Teal occur, mostly early in the fall, yet sometimes lingering late. In the past season I saw a Green-wing on Nov. 26. The Blue-wing is much the commoner of the two, though rapidly becoming scarce. Not many years ago large flocks were common, whereas now it occurs mostly singly or in small bunches. The Green-wing is quite scarce. Some of the stands have not taken them, until the past autumn, for many years. There was seemingly an irruption of this species in the fall of 1895. At Nippenickett they were taken five or six times,

and seen several times more. No large flocks occurred there. At Assowompsett a considerable flock was shot into, and a number secured.

The Shoveller (*Spatula clypeata*) is now one of our rarer ducks, and becoming more and more so. I have not been able to find it myself. Mr. Bassett has not taken it in Nippenickett in his twenty years' experience. Mr. Wood saw one captured in the fall, about 1881, taken from a flock of tame ducks, at the outlet of Billington Sea, Plymouth. He also knows of six or eight being shot at Great South Pond about five years ago. Dr. W. C. Woodward, of Middleboro, has taken the species occasionally in some of the Kingston ponds, until within ten years, since which he has not seen one.

The Gadwall (*Anas strepera*) is liable to be confounded with the Widgeon and Pintail. As I have not met with it myself, it is hard to find undoubted instances of its occurrence. Mr. Wood is the only one from whom I have obtained reliable information regarding it. He says that Gadwalls are "taken as stragglers with flocks of Black Duck during the fall migration at Billington Sea, rarely the past five years."

Passing now to the Fuliginæ, and not attempting any classification as to abundance, the Red-head (*Aythya americana*) may first be mentioned. It is found both on the coast and in the ponds. In numbers it is somewhat intermittent from year to year, though it occurs regularly each fall. From two to a dozen are said by one of the U. S. L. S. S. men to be taken off Manomet Point each season. Several at least are annually taken in Nippenickett, some years quite a number. In 1893 it was particularly numerous. On Oct. 10, eleven were secured from a flock of 32. I secured a specimen, adult male, at Chatham, Jan. 1, 1885, which shows that they sometimes winter. Mr. Wood has found them scarcer in the Plymouth ponds than I have a little further inland.

The only undoubted instance of the occurrence of the Canvas-back (*Aythya vallisneria*) which comes to my knowledge is reported by Mr. Wood. He has had in his possession one specimen, a lone bird that was decoyed and shot at Billington Sea, about 1885, in the autumn. A few other instances are reported, but cannot be proven beyond doubt.

The Scaup Ducks occur both on the coast and in the ponds. *A. marila* is much more abundant than *A. affinis*, and is one of the most common species in the larger ponds, next so, perhaps, to *Anas obscura*. Each autumn, from the middle of October until the ice forms, there is in Assowompsett a great gathering of these ducks, *marila* predominating, very shy, flying from one pond to the other, when pursued.

The closely related Ring-neck Duck (*A. collaris*) occurs but rarely. I noted two this fall, a pair, Nov. 23, which swam in to the decoys at the Nippenickett stand and were secured. Mr. Wood has noted several captures in the last ten years.

The Golden-eye (*Glaucionetta clangula americana*) is common on the coast and in the ponds in fall and winter. Its miniature, the Buffle-head (*Charitonetta albeola*), though not so common, is often seen in autumn both on salt and fresh water, and in the winter is quite frequent on the coast. In October and November they appear in the ponds in small flocks or singly, and are often surprisingly tame.

A single instance of the capture of Barrow's Golden-eye (*C. islandica*) is given me by Mr. Wood. A fine male was sent to him to be mounted, in the autumn of (about) 1885, shot in Plymouth, whether in fresh water or on the coast not being stated.

The Long-tailed Duck (*Clangula hyemalis*), that prince of flyers, is a familiar sight as it goes scaling past the points. It often comes into the ponds in autumn, in flocks or bunches. Mr. Bassett and I shot nine out of a flock of eleven in Nippenickett, Nov. 12, 1894, following them up in a row-boat. They could not be driven from the pond.

Three specimens of the Harlequin Duck (*Histrionica histrionica*) were taken off Manomet Point, Nov. 3, 1894. One of these is in my collection. This is the only record for this county with which I am acquainted. The species is common at Cape Sable, Nova Scotia, where it is known as the 'Rock Duck.'

One of the few ducks never as yet known to occur in our ponds is the Eider (*Somateria mollissima dresseri*). It is notably a marine bird, being commonly known as the 'Sea Duck.' Comparatively few come into Cape Cod Bay, most of them keeping

off outside the Cape. At Chatham it is abundant. Early in April thousands can be seen well off shore, flying north in long lines, or double lines.

The rare King Eider (*S. spectabilis*) has recently occurred at Manomet Point. Mr. W. H. Cleveland, of the Manomet Life-Saving Station, a careful and conscientious student of birds, is the authority. A single specimen was shot while flying past the Point, Nov. 15, 1895. Thick fog prevailed, and the day is remembered by many for the unusual number of Brant then taken. Another specimen was taken in the autumn of 1888, swimming alone in the cove south of the Point, thought perhaps to have been crippled while flying past the line of boats. This specimen, mounted, is at present in the possession of Mr. Cleveland's brother. Both of the above were males in full plumage. Still another specimen, said by the Station men to be of this species, was taken some years before this last, but Mr. C. cannot vouch for its identity.

Bare mention may be made, in passing, of the three Scoters, *Oidemia americana* being the least abundant of the three. They all occur in the ponds, though the one just mentioned is not so often seen there.

The tame little Ruddy Duck (*Erismatura rubida*), though sadly slaughtered, is not yet exterminated. I should call it far from uncommon, some years occurring in considerable numbers in some of the ponds. Flocks of as many as two dozen occasionally appear in October. Sometimes there is an irruption of them for a few days, and then all suddenly disappear. The past season they were scarcer than usual, only a few scattering ones being taken in Nippenickett. But in the previous autumn they were taken a number of times. About the middle of October a flock of twenty or more came into the pond, and not one got out alive.

The list closes with the Mergansers! The Red-breasted (*Merganser serrator*) is much the commonest, being the one usually taken on the coast, though common in the ponds. The Goosander (*M. merganser*) is popularly known as the 'Pond Sheldrake,' a term which describes its predilection for fresh water. The Hooded Merganser (*Lophodytes cucullatus*) is not common, but occurs regularly in the ponds, singly or in small flocks.

According to general testimony, the diminution of late years in the numbers of the ducks is very marked. Mr. Bassett, however, sees and takes in Nippenickett a larger number and greater variety of ducks of late years than ever before. The causes of the change in this case are not known, and it may be left to the reader to speculate upon them.

In all there are 28 species of ducks attributed to Massachusetts. We of course do not consider the Labrador and St. Domingo Ducks as occurring in the State. All of these 28 have occurred within comparatively recent years in Plymouth County. Twenty-four of them have been taken on fresh water. Barrow's Golden-eye would doubtless be added to this list, were the facts known, leaving only three of the ducks which, when with us, are strictly maritime, the two Eiders and the Harlequin. Of the 28 I should class seven only as decidedly rare,—the Ring-neck, Gadwall, Shoveller, Harlequin, King Eider, Barrow's Golden-eye, and Canvas-back.

JOHN ABBOT'S DRAWINGS OF THE BIRDS OF GEORGIA.

BY WALTER FAXON.

JOHN ABBOT's illustrations of the Lepidoptera of Georgia, edited by Sir James Edward Smith and published in two folio volumes at London in 1797, have made his name familiar to entomologists, but few ornithologists are aware that Abbot, during his sojourn in Georgia, made a series of colored drawings of the birds of that State. The Boston Society of Natural History has long possessed many of Abbot's unpublished drawings of Georgian insects¹, and there has lately come to light, in the

¹ These are bound in two volumes, one comprising 174 plates given to the Society by Asa Gray who received them from J. E. Gray of the British Museum, the other comprising 193 plates purchased of Dr. Oemler of Georgia.

library of the Society, a set of 181 water-color drawings of birds. This series of plates is accompanied by the following entry in the handwriting of the late Miss L. Foster¹: "Drawings of the Birds of Georgia, by John Abbot," but no record of how or when the collection came into the possession of the Society has yet been found. The plates are classified and numbered by Abbot himself from 1 up to 200, but nineteen are lost from the set. The names of the birds appear in most cases at the bottom of each plate, written in pencil the nomenclature being chiefly that of Wilson. One of the plates alone bears the inscription in ink, "J. Abbot delin. ad vivum, 1810," but the character of the drawings themselves as well as the considerable amount of Abbot's well known autograph on the backs of the plates leaves no doubt as to their origin.

The notes on the backs of the plates consist of memoranda in pencil relating to the dimensions of the birds drawn, often followed by the date (day of the month, but in no case the year) and notes on the colors and on the time of arrival of migratory species. These memoranda have in most cases been erased and replaced in many instances by the names of the birds in the writing of Dr. T. M. Brewer, through whose hands the whole lot of drawings must have passed. Fortunately, Abbot's notes can still be deciphered with time and patience.

We are chiefly indebted to Swainson² and S. H. Scudder³ for the few facts that are known concerning Abbot's life. Coming to America in the interest of several of the leading entomologists of England, probably about the year 1790, he soon settled in the State of Georgia, where he remained till as late as 1810. Here he mainly devoted himself to collecting, rearing, and drawing the insects of the State, together with the plants upon which they feed. The drawings published by Smith and those in the possession of the Boston Society of

¹ Miss Foster was Assistant in the Library from 1863 to 1885.

² Taxidermy, with the Biography of Zoölogists, and Notices of their Works. By William Swainson. Lardners's Cabinet Cyclopædia, Vol. CXXVI, 1840.

³ John Abbot, the Aurelian. By Samuel H. Scudder. Canadian Entomologist, XX, 1888, 150.

Natural History form but a small part of what he produced. Seventeen bound volumes of unpublished entomological drawings in the British Museum bear witness to his zeal and activity.¹

The place of Abbot's residence during his stay in Georgia has been barely rescued from oblivion by the late Col. Charles C. Jones² the historian of the State. From 1797 to 1847 the county seat of Screven Co., Ga. was the little town of Jacksonborough, situate some sixty or seventy miles N N W of Savannah and a few miles west of the Savannah River. It was here, according to Colonel Jones, that Abbot lived and wrought. After the removal of the public buildings from Jacksonborough to Sylvania in 1847, the old town was abandoned, its dwellings quickly fell to decay, and now a few shards of common pottery scattered over the surface of the soil alone serve to mark the place where it once stood.

From this region it is probable that most of the birds portrayed by Abbot came. Yet the considerable number of shore and sea birds included amongst the drawings would seem to show that the artist had recourse to the sea for some of his material.

Nineteen plates, as before said, are lost from the series. But if the remaining plates be arranged according to the numbers put upon them when the set was still unbroken their sequence will suggest the subjects of many of the missing numbers. Thus it is pretty safe to assume that Plate 16 was the male Red-winged Blackbird, 23 the Baltimore Oriole, 27 the male Boat-tailed Grackle, 29 the Purple Grackle, 31 the Yellow-billed Cuckoo, 44 the male Southern Hairy Woodpecker, 80 the Nonpareil, and so following. In this way we can, with some approach to precision, estimate the number of species included in the original set of 200 plates at about 160,—thirteen species being allowed for the nineteen missing numbers. A goodly number this, when one considers the period when the work was accomplished, the remoteness of the artist's residence from the sea, and the fact that ornithological pursuits were aside from the main purpose of his visit to

¹ See W. F. Kirby, in *Can. Entomol.*, XX, 1888, 230.

² *The Dead Towns of Georgia.* By Charles C. Jones. p. 240. *Coll. Georgia Hist. Soc.*, IV, 1878.

America. Some sixty years before Abbot came to Georgia, Mark Catesby was similarly engaged in illustrating the local fauna on the other side of the Savannah River, with special reference to the birds. Although Catesby had the advantage of a year's residence on the sea-board before he went up the Savannah River to live at Fort Moore, the number of Carolinian birds described and figured by him amounts to only 90 against Abbot's 160. Yet Catesby followed the pursuit with such ardor that he did not hesitate to affirm that few birds except aquatic species could have escaped him.¹

On looking through the Abbot bird-portraits several arrest the eye from their historic interest. Plate 68 is a good representation of Swainson's Warbler, drawn at least a quarter of a century before this species was described and named by Audubon. On the reverse of the plate is the following autograph note by Abbot: "L. 6. May 8. Swamp.—Swamp Worm-eater."

Swainson's Warbler was first described and figured by Audubon in 1834,² from specimens secured by John Bachman near Charleston, S. C., in 1832. Its second introduction to public notice was in the rôle of a bird of Georgia, in White's list of Georgia birds published by Alexander Gerhardt in 1855.³ The next record likewise relates to a Georgia specimen from Liberty County.⁴ But little was known concerning the habits of Swainson's Warbler until 1885, when Mr. William Brewster published a narrative of his experience in the bird's haunts near Charleston in the summer of 1884.⁵ It is now known to be a summer visitor to certain parts of North and South Carolina, Georgia, Florida, Alabama, Louisiana, Texas, Southeastern Missouri, and the Dismal Swamp of Virginia.

¹ The following species found among the Abbot drawings are not included in White's very full list of the birds of Georgia, published in 'Naumannia,' 1855, 382: *Nyctea nyctea*, *Loxia leucoptera*, *Ammodramus leconteii*, *Otocoris alpestris*, *Dendroica tigrina*, *Grus mexicana*, *Guara rubra*, *Totanus melanoleucus*, *Porzana carolina*, *Larus delawarensis*.

² Orn. Biog., II, 563.

³ Naumannia, 1855, 382.

⁴ Baird, Birds of North America, 1858, p. 253.

⁵ Auk, II, 1885, 65.

Plate 97.—Leconte's Sparrow (*Ammodramus leconteii*). This bird also was known to Abbot and drawn by him about forty years before it was described by Audubon. The next observer after Abbot who had the luck to meet with it was Maximilian, Prince of Wied, during his journey up the Missouri River in 1833. It was not until 1858, however, fourteen years after the species was described by Audubon, that Maximilian's account was published.¹ After a careful description of the specimen obtained, the Prince adds the following story of its capture, which gives one such a vivid idea of the elusive habits of the bird as to merit quotation: "I obtained a single specimen of this northern species near the middle course of the Missouri. The way in which the little bird crept about, just like a mouse, in the grass and under the bushes was remarkable. In fact, several of our party mistook it for a mouse. It was surrounded; yet, though unable to escape, it could not be forced to fly. It slipped quickly from one cover to another, while we all strove to catch it. When this was finally accomplished, I found that the supposed mouse was a little bird unknown to me."²

Ten years after Maximilian's capture of this specimen Audubon rediscovered the species on the upper Missouri and for the first time described and figured it in the seventh volume of the 'Birds of America,' p. 338, 1844.³ A quarter of a century then elapsed without further tidings of Leconte's Sparrow. Audubon's type was lost, Maximilian's was on the other side of the Atlantic, and the record of it overlooked. Certain ornithologists even began to doubt the existence of Leconte's Sparrow. Then a single specimen (a very bad one) came to light in the Smithsonian Institution,

¹ Journal für Ornithologie, VI, 1858, 340.

² This specimen is now with the Maximilian collection in the American Museum of Natural History of New York, according to Mr. J. A. Allen (Auk, III, 1886, 490), who does not appear to be aware that it was described by Maximilian in 1858.

³ Audubon's type specimen was shot on the 24th of May by Mr. J. G. Bell of New York, who accompanied Audubon on his Yellowstone Journey. Maximilian, through a curious misunderstanding of Audubon's narrative, says that *Ammodramus leconteii* has been taken in the State of New York in the month of May!

obtained in Washington Co., Texas, by Dr. Lincecum in 1869, but not recorded till 1872, in Coues's 'Key to North American Birds,' p. 137. Soon after, Dr. Coues himself had the pleasure of securing several examples of the discredited species in Dakota, in 1873.¹ But not until 1878, about seventy years after Abbot drew the portrait of Leconte's Sparrow in Georgia, was this bird rediscovered east of the Mississippi—in winter-quarters at Coosada, Ala.,—by N. C. Brown.² Finally, in 1881, Mr. C. J. Maynard³ detected it in Florida, and Mr. L. M. Loomis⁴ in Chester Co., South Carolina.

Further on we come to No. 161, the Scarlet Ibis. Most of the records of the Scarlet Ibis as a bird of the United States rest upon rather questionable evidence. Wilson⁵ supposed that it was found in the extreme southern part of Carolina, and in Georgia and Florida. The best Audubon could do was to get a glimpse of three, flying over the tops of the trees near Bayou Sara, La., in July, 1821.⁶ A fragment of a specimen was examined by Dr. Coues on the Rio Grande at Los Pinos, New Mexico, in June, 1864.⁷ One has been recorded as shot in Custer Co., Colorado, in May, 1876.⁸ Mr. Brewster⁹ found an old faded and moth-eaten specimen in the museum of the College of Charleston, labelled "Florida." Finally, to end this strange, if not very eventful history, Mr. W. E. D. Scott¹⁰ says that one was seen in Florida in 1888 by a plume-hunter in whom he has perfect confidence.¹¹

¹ Amer. Nat. VII, 1873, 748. Birds of the Northwest, 1874, 134.

² Bull. Nuttall Orn. Club, IV, 1879, 8.

³ Bull. Nuttall Orn. Club, VII, 1882, 121.

⁴ Bull. Nuttall Orn. Club, VII, 1882, 54.

⁵ American Ornithology, VIII, 1814, 41.

⁶ Orn. Biog., V, 1839, 62.

⁷ Key to North American Birds, 1872, 264; *id.*, 1887, 651.

⁸ Auk, XI, 1894, 324.

⁹ Bull. Nuttall Orn. Club, VIII, 1883, 185.

¹⁰ Auk, VI, 1889, 15.

¹¹ H. B. Bailey, in 'Forest and Stream Bird Notes,' 1881, p. 78, indexes under *Ibis rubra* a note in 'Forest and Stream,' III, 58, relating to some "Pink Curlews" killed by sportsmen at St. Augustine, Fla., in 1874. These "Pink Curlews" were without doubt Roseate Spoonbills.

The presence of the Scarlet Ibis among Abbot's drawings of the birds of Georgia establishes, to my mind, a better record for the United States than some of those above mentioned. It is highly improbable that he received a specimen from Central or South America and still more unlikely that he would have interpolated a foreign bird in this series of drawings. For we know from the whole tenor of his work in Georgia that it was his purpose to illustrate the local fauna.

Of the rarer birds for the latitude of Georgia that are included in the collection may be mentioned the Snowy Owl, the White-winged Crossbill, and the Horned Lark (*Otocoris alpestris*). The White-winged Crossbill has never to my knowledge been reported from so far south as Georgia. The arctic race of the Horned Lark, although noted by Catesby¹ as frequenting the sand-hills along the shore of South Carolina in winter, has within a few years been recorded as a novelty from that coast.²

A very remarkable Woodpecker is represented on Plate 48. It is like the male *Dryobates borealis* except that the red 'cockades' are enlarged so as to form one continuous bright red patch, extending across the nape, as in *D. nuttallii*, *D. villosus*, etc. The normal male and female *D. borealis* are figured on Plates 46 and 47 under Wilson's name of *Picus querulus*. Plate 48 is inscribed "*Picus* n. s.?" Both Mr. Brewster and Mr. Ridgway assure me that they have never seen the like of this bird. I take it to be a 'sport' of *Dryobates borealis*,—the manifestation of a tendency normally latent in this species, but commonly expressed in allied members of the genus. It is the converse of the condition sometimes seen in *D. villosus*, when the red occipital band is broken into a pair of spots,—right and left.

With regard to the period when the drawings were made, we have no evidence beyond the term of Abbot's residence in Georgia, the date 1810 in the legend under the figure of the Bald Eagle, and the manufacturer's water-marks which appear on the paper used. According to Mr. Scudder, Abbot came

¹ Nat. Hist. Carolina, I, 1731, 32, Pl. XXXII.

² A. T. Wayne, Auk, X, 1893, 205.

to America about 1790 and returned to England about 1810. This accords with the water-mark dates, which include various years from 1791 to 1810 inclusive. The extreme dates occur on the insect plates in the Boston Society of Natural History. The water-marks in the set of bird drawings are three: "J. Whatman, 1801" (22 plates), "Edmeads and Pine, 1802" (22 plates), and "S C, 1804" (8 plates). It is pretty certain, therefore, that the birds were drawn between 1800 and 1810. The final arrangement, enumeration, and identification of the figures were somewhat later, as is proved by citations of the sixth volume of Wilson's *Ornithology*, which was not published till 1812.

From an artistic point of view, these plates, although not so exquisitely elaborated as Abbot's insect drawings, are admirable. While the accessories are rather quaint and old-fashioned, the birds themselves, though unequal in finish, are for the most part accurately drawn and skilfully colored. In the simplicity and even monotony of the postures they recall Wilson's work rather than the more spirited figures of Audubon. In many ways these drawings evince Abbot's remarkable keenness of observation. Sexual and seasonal phases of plumage, so diverse as to be mistaken for specific differences by the earlier ornithologists, were understood by Abbot. Thus, on Plate 112 the male Black-throated Blue Warbler is joined with his sober-suited mate, although Wilson and many of his followers put them asunder. In other cases, nice subspecific distinctions, not recognized till lately by ornithologists, are unmistakably indicated in these drawings. Doubtless Abbot supposed them to be diversities of sex or age, but they bear witness all the same to his close discrimination. In only one instance is the artist guilty of a flagrant error. Plate 171 represents a Sanderling with a hind toe! It is inconceivable to anyone who has carefully studied the whole collection of drawings that Abbot himself was responsible for such a blunder. Swainson says that Abbot found it expedient to employ one or two assistant artists, whose copies he retouched. I am disposed to think that an assistant living on the sea-coast made color sketches of some of the shore and sea birds and that Abbot reproduced these

sketches. It was Abbot's wont to note the dimensions of the birds that he drew from life, in the form of memoranda entered on the reverse of the plates. This is done for most of the land birds, but it is a noteworthy fact that very few of the portraits of sea birds are so endorsed. Whoever drew the Sanderling decreed that this bird, being a Sandpiper, should not be liable, like the three-toed Waders in Gilbert White's speculation, to "perpetual vacillations"!

If Abbot—a contemporary of Wilson and Vieillot—had secured the speedy publication of this remarkable collection of drawings, with a suitable accompaniment of text, his name would be famous in the annals of American ornithology. "Many are poets who have never penned their inspiration." So, in the light of the work here reviewed, Abbot appears to have been an ornithologist—but without the name.

A catalogue of these drawings is appended—Abbot's 'local list,' made during the opening decade of the century now drawing to a close.

PLATE

- | | |
|--|---|
| 1. <i>Cathartes aura</i> (Linn.). | 18. <i>Agelaius phœniceus</i> (Linn.). |
| 2. <i>Catharista atrata</i> (Bartr.). | Young male. |
| 3. <i>Haliæetus leucocephalus</i> (Linn.). Full plumage. | 19. <i>Agelaius phœniceus</i> (Linn.). |
| 4. <i>Buteo lineatus</i> (Gmel.). | Albino. |
| 5. " " " Young. | 20. <i>Scolecophagus carolinus</i> (Mull.) Spring plumage. |
| 6. <i>Accipiter cooperii</i> (Bonap.). | 21. <i>Scolecophagus carolinus</i> (Mull.). Autumn plumage. |
| 7. <i>Circus hudsonius</i> (Linn.). | 22. <i>Molothrus ater</i> (Bodd.). Male. |
| Male in winter plumage. | 23. [Missing.] |
| 8. <i>Falco sparverius</i> . Linn. Male. | 24. <i>Icterus spurius</i> (Linn.). Adult male. |
| 9. [Missing.] | 25. <i>Icterus spurius</i> (Linn.). Female. |
| 10. <i>Nyctea nyctea</i> (Linn.). | 26. <i>Icterus spurius</i> (Linn.). Male of second year. |
| 11. <i>Syrnium nebulosum alleni</i> Ridgw. | 27. [Missing.] |
| 12. [Missing.] | 28. <i>Quiscalus major</i> Vieill. Female. |
| 13. " " | 29. [Missing.] |
| 14. <i>Corvus americanus</i> Aud. | 30. " " |
| 15. <i>Cyanocitta cristata</i> (Linn.). | 31. " " |
| 6. [Missing.] | |
| 17. <i>Agelaius phœniceus</i> (Linn.). | |
| Female. | |

32. *Coccyzus erythrophthalmus* (Wils.).
33. *Campephilus principalis* (Linn.). Male.
34. *Campephilus principalis* (Linn.). Female.
35. *Ceophlæus pileatus* (Linn.). Male.
36. *Ceophlæus pileatus* (Linn.). Female.
37. *Colaptes auratus* (Linn.). Male.
38. *Colaptes auratus* (Linn.). Female.
39. *Melanerpes carolinus* (Linn.). Male.
40. *Melanerpes carolinus* (Linn.). Female.
41. *Melanerpes erythrocephalus* (Linn.).
42. *Sphyrapicus varius* (Linn.). Male.
43. *Sphyrapicus varius* (Linn.). Female.
44. [Missing.]
45. *Dryobates villosus audubonii* (Swains.). Female.
46. *Dryobates borealis* (Vieill.). Male.
47. *Dryobates borealis* (Vieill.). Female.
48. *Dryobates borealis* (Vieill.)? Male.
49. *Dryobates pubescens* (Linn.). Male.
50. *Dryobates pubescens* (Linn.). Female.
51. [Missing.]
52. *Sitta carolinensis* Lath.
53. " *canadensis* Linn.
54. " *pusilla* Lath.
55. *Certhia familiaris americana* (Bonap.).
56. *Trochilus colubris* Linn. Male and female.
57. *Sturnella magna* (Linn.).
58. *Mimus polyglottos* (Linn.).
59. *Harporhynchus rufus* (Linn.).
60. *Turdus mustelinus* Gmel.
61. " *fuscescens* Steph.
62. " *aonalaschkæ pallasii* (Cab.).
63. *Seiurus aurocapillus* (Linn.).
64. " *noveboracensis* (Gmel.). Two figs. Upper one S. n. *notabilis* Ridgw.
65. *Merula migratoria* (Linn.). Male.
66. *Merula migratoria* (Linn.). Female.
67. *Helminthus vermivorus* (Gmel.).
68. *Helinaia swainsonii* Aud.
69. *Ampelis cedrorum* (Vieill.).
70. *Guiraca cærulea* (Linn.). Male.
71. *Guiraca cærulea* (Linn.). Female.
72. *Cardinalis cardinalis* (Linn.). Male.
73. *Cardinalis cardinalis* (Linn.). Female.
74. *Loxia leucoptera* Gmel. Male.
75. *Dolichonyx oryzivorus* (Linn.). Male.
76. *Dolichonyx oryzivorus* (Linn.). Female.
77. *Pipilo erythrophthalmus* (Linn.). Male.
78. *Pipilo erythrophthalmus* (Linn.). Female.
79. *Passerina cyanea* (Linn.). Male and female.
80. [Missing.]
81. *Junco hyemalis* (Linn.). Male and female or male in winter.
82. *Spinus tristis* (Linn.). Male and female.
83. *Passerina cyanea* (Linn.). Young.
84. *Piranga rubra* (Linn.). Male.
85. " " " Female.

86. *Piranga erythromelas* (Vieill.
Male.
87. *Carpodacus* *purpureus*
(Gmel.). Male.
88. *Carpodacus* *purpureus*
(Gmel.). Female.
89. *Passerella iliaca* (Merr.).
Two figs.
90. *Poocætes gramineus* (Gmel.).
91. *Zonotrichia albicollis* (Gmel.).
Adult and immature.
92. *Passerculus sandwichensis*
savanna (Wils.). Two figs.
93. *Melospiza fasciata* (Gmel.).
94. [Missing.]
95. "
96. "
97. *Ammodramus leconteii* (Aud.).
98. *Spizella socialis* (Wils.).
Adult and immature.
99. *Spizella pusilla* (Wils.).
Two figs.
100. [Missing.]
101. *Galeoscoptes carolinensis*
(Linn.).
102. *Contopus virens* (Linn.).
103. *Vireo olivaceus* (Linn.).
104. "*solitarius* (Wils.).
105. "*noveboracensis* (Gmel.).
Two figs. Lower one looks like V.
n. maynardi, Brewst.
106. *Setophaga ruticilla* (Linn.).
Male and female.
107. *Icteria virens* (Linn.).
108. *Otocoris alpestris* (Linn.).
109. *Anthus pensilvanicus*
(Lath.).
110. *Sialia sialis* (Linn.). Male.
111. "*"* (Linn.). Female.
112. *Dendroica cærulescens*
(Gmel.). Male and female.
113. *Dendroica vigorsii* (Aud.).
Male and female.
114. *Dendroica palmarum*
(Gmel.) and *D. p. hypochrysea*
Ridgw.
115. *Dendroica tigrina* (Gmel.).
Male in autumnal plumage.
116. *Dendroica coronata* (Linn.).
Two figs.
117. *Dendroica striata* (Forst.).
Male in spring and young first
autumn.
118. *Dendroica tigrina* (Gmel.).
Female.
119. *Sylvania mitrata* (Gmel.).
Male and female.
120. *Geothlypis trichas* (Linn.).
121. *Protonotaria citrea* (Bodd.).
Two figs.
122. *Dendroica æstiva* (Gmel.).
Male and female.
123. *Dendroica discolor* (Vieill.).
Male and female.
124. *Compsothlypis americana*
(Linn.). Male and female.
125. *Dendroica dominica* (Linn.).
Male and young first autumn.
126. *Thryothorus ludovicianus*
(Lath.). Two figs.
127. *Troglodytes ædon* Vieill.
128. *Cistothorus stellaris* (Licht.).
129. *Regulus calendula* (Linn.).
Male and female.
130. *Regulus satrapa* Licht. Male
and female.
131. *Mniotilta varia* (Linn.).
Two figs.
132. *Parus bicolor* Linn.
133. "*carolinensis* Aud.
134. *Polioptila cærulea* (Linn.).
Male and female.
135. *Progne subis* (Linn.). Male.
136. "*"* "*"* Female.
137. *Chelidon erythrogastra*
(Bodd.).
138. [Missing.]
139. *Chaetura pelagica* (Linn.).
140. *Stelgidopteryx serripennis*
(Aud.)?
141. *Antrostomus carolinensis*
(Gmel.). Male.

142. *Chordeiles virginianus* (Gmel.). Male.
143. *Ectopistes migratorius* (Linn.). Male.
144. *Zenaidura macroura* (Linn.). Male.
145. *Columbigallina passerina terrestris* Chapm. Male.
146. *Colinus virginianus* (Linn.).
147. *Grus mexicana* (Müll.).
148. *Botaurus lentiginosus* (Mon-
tag.).
149. *Nycticorax violaceus* (Linn.).
150. " " Young.
151. *Ardea egretta* Gmel.
152. *Nycticorax nycticorax nae-
vius* (Bodd.). Adult.
153. *Ardea tricolor ruficollis* (Gosse). Adult.
154. *Ardea tricolor ruficollis* (Gosse). Young.
155. *Ardea cærulea* Linn. Blue
phase.
156. *Ardea cærulea* Linn. White
phase.
157. *Ardea virescens* Linn.
158. " " "
159. *Guara alba* (Linn.). Young.
160. " " " Adult.
161. " *rubra* (Linn.). Adult.
162. *Numenius longirostris* Wils.
163. *Limosa fedoa* (Linn.).
Young.
164. *Gallinago delicata* (Ord).
165. *Philohela minor* (Gmel.).
166. *Symphemia semipalmata*
inornata Brewst. Winter plumage.
167. *Totanus melanoleucus*
(Gmel.).
168. *Totanus flavipes* (Gmel.).
169. [Missing.]
170. *Totanus solitarius* (Wils.).
171. *Calidris arenaria* (Linn.).
Winter plumage.
172. *Actitis macularia* (Linn.).
Adult.
173. *Actitis macularia* (Linn.).
Young.
174. *Tringa minutilla* Vieill.
175. *Ægialitis vocifera* (Linn.).
176. *Hæmatopus palliatus* Temm.
177. *Rallus elegans* Aud.
178. *Porzana carolina* (Linn.).
Young.
179. *Porzana carolina* (Linn.).
Adult.
180. *Ionornis martinica* (Linn.).
181. *Gallinula galeata* (Licht.).
182. *Rynchops nigra* Linn.
183. *Hydrochelidon nigra surina-
mensis* (Gmel.). Young.
184. *Podilymbus podiceps* (Linn.).
Winter plumage.
185. *Larus delawarensis* Ord.
Young.
186. *Larus atricilla* Linn. Win-
ter plumage.
187. *Gelochelidon nilotica* (Has-
selq.).
188. *Merganser serrator* (Linn.).
Male.
189. [Missing.]
190. *Lophodytes cucullatus*
(Linn.). Male.
191. *Lophodytes cucullatus*
(Linn.). Female.
192. *Spatula clypeata* (Linn.).
Male.
193. *Aix sponsa* (Linn.). Male.
194. *Aythya collaris* (Donov.).
Male.
195. *Aythya affinis* (Eyt.). Male.
196. " " " Female.
197. *Clangula clangula americana*
(Bonap.). Female.
198. *Charitonetta albeola* (Linn.).
Male.
199. *Charitonetta albeola* (Linn.).
Female.
200. *Anas carolinensis* Gmel.
Male.

THE PENINSULA OF MISSOURI AS A WINTER HOME
FOR BIRDS.

BY O. WIDMANN.

A LIST of 47 species of birds, found around Cardwell, the present terminus of the Buffalo Island R. R., Dunklin Co., Mo., January 14-18, 1896, not only reflects the woodland character of the region, but also illustrates the great advantages of heavily timbered lowland for the winter sojourn of certain birds in a comparatively cold climate.

Every winter snow covers the ground to a depth of several inches for a whole fortnight, and all the watercourses, including the St. Francis River itself, are closed for a like period with an ice sheet several inches thick. The mercury is pretty sure to go as low as 10°, and in severe winter even falls to -10°, but as a rule the cold squalls last only a few days.

With the exception of a narrow ridge, called Grand Prairie, which separates the Little River from the St. Francis basin, the whole region is covered with original forest, and farming is done in clearings and deadenings, situated within this forest. On the railroad line saw mills have been erected, and the best lumber, especially oak, is now being cut out; but in a region like this, where lumber is so abundant, only the most valuable part of a tree is sawed off and taken to the mill; all the rest is left to decay where it fell. Many trees, having been cut green, retain the dry foliage throughout the winter.

In their slow decay the huge treetops, covering several square rods of ground and thus keeping off the browsing cattle, allow the weeds, briars and blackberry brambles to grow in profusion. Rich soil, combined with an abundance of moisture and sunlight, form in a few years the most impenetrable thickets, whose depths are accessible to hardly anything else but small birds, and for these they afford an unexcelled resort at night and in inclement weather, providing safety, shelter and food. The heavy cover protects not only birds, but also vegetation and lower animal life, and the carpet of green grasses, ferns and a variety of hardy plants, which

is spread over the floor of the forest, is much richer under these treetops.

Such is an outline of the locality where numberless flocks of several kinds of Fringillidæ spend their winter in pleasing harmony and apparently in the best possible state of mind and body. Even when the rain is coming down in a continuous drizzle all day long the birds in these woods are not only busy and active, but also contented and happy; and on a day, which to ordinary persons seemed the gloomiest possible "we" and the birds were the happiest crowd.

Especially the Fox Sparrow (*Passerella iliaca*) deserves the highest praise for exhibiting the most undisturbable good humor; all day long, and more than ever in the dusk of evening, his melodious voice goes through the leafless woods. It is not their full whistle, which we hear in spring, but enough of it to show how happy they are and enough to make others happy, too.

It is a common thing to see a couple of Peabody-birds (*Zonotrichia albicollis*) take up the thread of musical notes where the other lets it drop, hold it up for others who spin it out for quite a while, until the stentorian voice of Mr. Pipilo falls in and cuts it short with his *to-whhees*.

All these birds are never so cheerful where only a few are together. They feel much safer and easier in a crowd, because the trying work of constant vigilance is divided among so many, and there is no doubt that they really enjoy the company of others of their kind, and of birds with similar habits, though of different genera, and even other families.

The most abundant member of the Sparrow family in these woods is undoubtedly the White-throated Sparrow or Peabody-bird. It does not occur in small parties of half a dozen or so, as it does in the counties bordering the Missouri River, 250 miles farther north. Though there may be only a few chirps in the underbrush when you pass by, enter their recesses and you will see them rise from all sides, and you may count 50 before you get through. It is a phlegmatic bird, not easily alarmed, and keeps sitting in the trees and bushes to give you time for your arithmetic. The Fox Sparrows are second in numbers and very often go up with the White-throats, but as a rule they are more partial to moist ground.

At the other side, on the higher levels, where corn and cotton fields occupy a part of the ground, the immense flocks of Juncos (*Junco hyemalis*) join those of the Peabody-birds, and they in turn are often flanked by jolly troops of Tree Sparrows (*Spizella monticola*) and Goldfinches (*Spinus tristis*).

The numerous Pipilos (*Pipilo erythrophthalmus*) associate with the Fox Sparrows and Peabody-birds in the woods, but the Cardinals (*Cardinalis cardinalis*) keep company to all; they are in the deep woods along the sloughs, as well as in the openings along the fences. Their loud song is familiar to all; it wakes the sleepers at the earliest dawn and falls unexpectedly upon the ear in seemingly deserted regions.

The Song and Swamp Sparrows (*Melospiza fasciata* and *M. georgiana*) do not form flocks by themselves, but are scattered in small parties and help to swell the throng of kindred souls.

It is a blessed region where we can listen to the sweet notes of all these songsters in deepest winter, in rain, in sleet and snow; and the dreaded season has lost its terrors of loneliness and desolation, where such true friends of song and happy companionship have made their winter home.

Though the Sparrow family forms the gross of the camping army in the woods, we are every now and then reminded of the fact that we are in a country, with a climate which the Thrasher (*Harporhynchus rufus*) finds not too cold to endure winter's longest nights and on food rich enough to find a sufficiency in its shortest days. Although he does his best to elude the gaze of the intruder, his conspicuous size does not admit of much success in this endeavor, and we must class him among the best known birds of the region at this season. Happy he who gets a chance to hear the great composer tune his latest thoughts at half-voice in the bushes; his Easter cantata is not ready yet, but long before spring has come to northern climes the Peninsula Thrasher will mount his favorite perch and proclaim in his exquisitely melodious way that within himself the hope for an early resurrection of love's sweet season is growing with each day.

A unique sight met my eye on Jan. 15: a Thrasher with a pure white nape, an area about one and a half inches wide, but running to a point on the side of the neck, almost encircling it.

At this same day and place another rarity was found: a Cat-bird (*Galeoscoptes carolinensis*), feeding quietly among the leaves on the ground, and after a while flying up into a hackberry tree to partake of a few berries. Besides the white-naped Thrasher its nearest neighbors were the usual congregation of Fox Sparrows, Pipilos, Cardinals, Song Sparrows, etc.

Two other members of the Wren family constitute an important ingredient of the bird fauna of this region, and, though of small and even diminutive size, contribute greatly to the enjoyment of the visitor by their sprightly actions, confiding ways and pleasing notes. I mean the Carolina Wren (*Thryothorus ludovicianus*) and the Winter Wren (*Troglodytes hiemalis*). While the former, as a native of the soil, is the real owner of the ground and tells all who come and at all times of day and year that his title is as good as any title on decaying logs and debris ever was, he leases part of his domain to his little cousin from the north, who takes it regularly for just six months, from October 1 to April 1.

Though it seems liberal enough to thus divide an old estate with a distant relative, the lord and owner of the ground takes care to keep the higher levels for himself, and our little brownie has to put up with the watery regions of the slough and overflow. Here he is, during all his stay, as much at home as in his northern woods in summer. He, who knows him only from his flying visits, is most agreeably surprised to see he has a voice not only for a scold, but also for a praise, a rich, long song which is in perfect harmony with his surroundings. With this song he announces his arrival in October and gives it with increased vigor long before he leaves in spring. He is on friendly terms with his solemn neighbor, the Hermit Thrush (*Turdus aonalaschkæ pallasii*) who, like him, has a predilection for the overflow, and who, like him, is silent when away from home. He must regard this region as a kind of home, since he greets it with his most tender strains on his return in the fall, and sings aloud before he leaves it for the north.

In spite of near relationship the Robin (*Merula migratoria*) is an entirely different sort of winter boarder in this region. He does not hide from morning until night; nor does he look about for ages before he takes a heart to speak out what he thinks. You

can hear him when he comes, and he does not come alone; nor does he stay in one particular place until he becomes a bore; he comes in jolly troops, feeds, sings and goes.

While the Wrens and Thrushes keep company to the scratching Sparrows on the ground, the Paridæ and Picidæ populate the trees from root to highest tip.

Of Woodpeckers there are seven species in these woods, the Downy (*Dryobates pubescens*), the Hairy (*D. villosus*), the Flicker (*Colaptes auratus*), the Sapsucker (*Sphyrapicus varius*), the Red-belly (*Melanerpes carolinus*), the Redhead (*M. erythrocephalus*), and the Pileated (*Ceophlæus pileatus*).

Though the Redheads are oftener seen in the deadenings than in the deep forest, all seven species are so plentifully and thoroughly distributed over the woods that it has actually occurred that all seven species were together on near trees in front of me at one and the same moment.

As a rule the Sapsuckers are by far the least, the Redbellies the most talkative of the family, but all are making some noise, hammering or calling, and there is not a minute throughout the day when one or the other cannot be heard.

Less scattered, and therefore not quite so omnipresent, are the Paridæ. They are, besides, more under the influence of the weather. For some reasons, probably best known to their dressmaker, they dislike damp weather, which makes them somewhat morose; but they are quick to respond to the exhilarating effect of a high barometer with its bright skies and frosty mornings.

As usual the three Paridæ, *Parus bicolor*, *P. carolinensis*, and *Sitta carolinensis*, are mostly found associated with a few representatives of kindred folks, especially *Certhia familiaris americana* and *Regulus satrapa*, both of which are common winter sojourners in these beautiful woods.

Only once observed was *Sitta canadensis*, apparently a stranger to the region; but a bird, whose abundance at this time was not expected, is the Ruby-crowned Kinglet (*Regulus calendula*), which was found in all places visited and in all sorts of company, several times with Yellow-rumps (*Dendroica coronata*). There is not much poison ivy growing in these woods, but wherever there

is some, we hear the *chuck* of the Yellow-rump and see a few of the sprightly, restless birds.

Not a single Crow was to be seen in this country, and Blackbirds were among the rarities. The barnyard is the only place where a troop of Rusties (*Scolecophagus carolinus*) is likely to be seen on a midwinter's day and a few stray Redwings (*Agelaius phœniceus*) may be encountered in the clearings.

Though not very numerous here in summer the Bluejay (*Cyanocitta cristata*) is now one of the most abundant and conspicuous birds. They seem to have come from the north in search of health; they go about their work singly, but hold frequent meetings for sundry purposes and may often be seen gesticulating and complimenting each other on their good appearance and healthy looks, and truly they seem to feel uncommonly well.

The Bobwhite (*Colinus virginianus*) also is an inmate of the woods where he has his favorite resting places under fallen tree-tops.

The Wild Turkey (*Meleagris gallopavo*) is still a pretty common bird in this comparatively wild region, where cornfields, blackberry thickets and cypress-swamps join each other in all directions. In the cornfield he finds some of his food, in the thickets a retreat, and in the swamps a roost. He is not known to roost anywhere else but above water and if the weather is not too bad he retires to the higher branches.

Ducks are unusually rare in the region this winter and three Hooded Mergansers (*Lophodytes cucullatus*) were all the Water Birds met with.

The total absence of Ducks is generally accounted for by lack of food and superabundance of water. One of the main articles of their diet is the seed of smartweed, but the crop of the high southern smartweed (*Polygonum densiflorum*) has been an entire failure. The plant came up slowly last summer, probably in consequence of the unusually severe winter of 1894-95, and it was in full bloom when the frosts of the first October days visited the region. Though no bad effect was visible at the time, the frost seems to have checked fructification.

The clearings and deadenings, enclosed as they are by the forest, do not change the character of the country greatly, but

they harbor a few species which are not found in the forest itself, and the Hawks and Owls resort to them for preying upon the rodents, which infest the corn and cotton fields.

In such clearings we have repeatedly heard the cheerful carols of Bluebirds (*Sialia sialis*) and in view of our experience with the species last spring, we are doubly glad to hear them. Does not each note contain a promise of extraordinary value? Is it not as if a real treasure, already given up as lost, is to be restored to us again?

On a solitary tree in the field sits a solitary Shrike, and higher up on top of an old stump a male Sparrow Hawk; he is busy-ing himself with something, but fearing approach he leaves and takes with him his prey—a woodrat. On a distant tree an old Redshoulder (*Buteo lineatus*) holds a look-out for the benefit of the farmer and over a particularly odoriferous spot six Turkey Vultures (*Cathartes aura*) are drawing closer and closer circles, apparently intent on an early descent upon the remains of one of the farmer's special pets.

A small troop of Meadowlarks (*Sturnella magna*) is changing its field of labor to another part of the big cornfield, and from the old rail fence comes a harsh, shrike-like, note: it is the expression of surprise on the part of a Mockingbird. Before we turn to leave we get a glimpse of the only Purple Finch (*Carpodacus purpureus*) met with in this region, and following the fence a flock of at least one hundred small birds is seen going up from the cornfield as if at a word of command. They are mostly Juncos and Goldfinches, but we also identify a few Field Sparrows (*Spizella pusilla*), a species which we found only at three or four places and in small numbers.

Still watching the host of frightened Fringillidæ we learn the cause of the stampede, a Barred Owl (*Syrnium nebulosum*), abroad in the middle of the afternoon, but apparently occupied with thoughts of a defensive, rather than of an offensive nature.

THE BLACK-VENTED SHEARWATER (*PUFFINUS*
OPISTHOMELAS).

BY A. W. ANTHONY.

MR. LEVERETT M. LOOMIS has recently published in the Proceedings of the California Academy of Sciences (Ser. 2, Vols. V, VI), a series of notes on the Water Birds of Southern California treating largely on the migration of certain species.

It is not my intention to criticise the above papers nor to in any way throw discredit upon the published observations of the writer, but, as the subject is one to which I have paid especial attention for a number of years, to place on record a few of my notes on one of the species observed by Mr. Loomis, as they are in some respects at variance with the conclusions arrived at by that writer.

In his 'California Water Birds' (No. II, p. 2), Mr. Loomis says: "Winter migration in birds nesting in the Northern Hemisphere is a well-known fact, there being continual movement southward and northward as the zone of snow and ice advances and retreats, but migration southward in the Northern Hemisphere in winter to breeding grounds appears to have escaped the observations of ornithologists. Such a migration exists in the Black-vented Shearwaters." And again (l. c., p. 7): "The Black-vented Shearwaters at Monterey were undoubtedly migrating to a breeding habitat farther South. While their destination may have been north of the equator it seems highly probable that they did not stop short of the Southern Hemisphere."

That the Black-vented Shearwater is a resident on the coast of California, nesting on several of the islands of the peninsula and coast of Southern California at least, I have known for several years. Just how far north their breeding habitat extends I am unable to say but have found the species not uncommon on several occasions off the Columbia River during the summer months and in November and January.

As very little has been published regarding this Shearwater, and as almost nothing is known of its nesting habits, I will take

this opportunity of giving some of my notes in detail, while establishing its claim to a position among our breeding birds.

On May 15, 1892, in company with Messrs. Charles H. Townsend and Clark P. Streator, I reached Guadalupe Island from San Diego and anchored under the high cliffs of lava at the North Head, about the middle of the afternoon.

Guadalupe lies about 220 miles south of San Diego, and about 65 miles from the nearest mainland, Punta Baja, on the Peninsula. The island is entirely of volcanic matter, huge cliffs of lava rising often 3000 feet from the sea. These are honey-combed by thousands of holes and miniature caves, offering unexcelled nesting sites for Cassin's Auklet, Xantus's Murrelet and other burrowing species, including the Black-vented Shearwater. Shortly after dark I was called on deck to listen to and identify some bird notes that came from the crags almost over our little schooner. The outcry soon increased to a moderate uproar, and was immediately recognized as the breeding notes of *Puffinus opisthomelas*, which I had several times heard in January and February while the birds were mating off the coast of San Diego County.

It would be impossible to describe accurately these notes. They were a series of gasping wheezy cries, resembling somewhat the escape of steam through a partly clogged pipe, uttered in a slightly varied key and repeated from four or five, to ten times. During calm weather in January, February, and March flocks of a dozen to several hundred of these Shearwaters often collect on the water well off shore and at such times I have heard the same notes from two or more birds as they chased each other, half running, half flying over the water. From the notes that came from the cliffs I thought that the birds were chasing one another, and a little later many of them came down to the water and were occasionally seen as they flashed by within the circle cast by our anchor light. After an hour or so the outcry somewhat subsided and I think most of the birds went off shore to feed, returning before daylight, for during nearly two weeks spent in cruising about the island only one flock of Shearwaters was seen in the daytime.

The cliffs about the North Head are all inaccessible, rising directly from the water, from a few hundred, to nearly or quite

three thousand feet, so that nothing could be learned of their nesting at that point. Three days later, however, we dropped anchor in Wheeler's Bay, at the southern end of the island, where the land is somewhat lower, and here a colony was found near the water. The burrows were in every instance either under a huge block of lava or in a crevice, where they were as much out of our reach as they were in the cliffs. A few of the burrows might have been opened possibly had we been provided with crowbars and suitable tools for wedging apart the blocks of lava, but after several ineffectual attempts with the tools nature provided we gave up and set a few steel traps at the mouths of some of the burrows in order to establish beyond dispute the identity of the species.

The next morning one or two Black-vented Shearwaters were taken from the traps and one of them, when hauled from the burrow, gave vent to his feelings in the gasping cry which we had heard every night since our arrival at the island. Two females were found by Mr. Streater in a crevice between two blocks of lava and secured, but no eggs or sign of nest was to be found. From this I thought that perhaps they were through with their nesting but had not yet abandoned the burrows during the day. The specimens prepared by me had evidently bred, and doubtless had at that time well grown young. Burrows were several times found two or three miles from the beach and as high as 4,000 feet altitude, and the mutilated bodies of freshly killed birds were often found where cats had left them. These felines, the descendants of domestic animals, introduced by the Mexicans, fairly infest the island and have made very serious inroads on the feathered inhabitants of Guadalupe, threatening some species with ultimate extermination.

A night was spent in a cypress grove three miles from the water and over 4,000 feet in altitude. Several times during the night I heard Shearwaters chasing each other through the grove and it is not impossible that a few were nesting there.

Major Chas. E. Bendire writes me that there are four eggs of this species in the National Museum collection, collected in 1873 on Santa Barbara Island by Capt. C. M. Scammon. I have never explored the Northern Islands of the Santa Barbara group, but I

am satisfied that Shearwaters do not nest on either San Clemente or Santa Catalina Islands. From information obtained from a reliable source I am inclined to think they are not uncommon on two or more of the smaller outlying islands.

During February and March of the current year ninety-eight per cent. of the Black-vented Shearwaters observed off San Diego were flying northward and the reproductive organs of those taken late in February indicated that the nesting season was very near at hand. They would have bred within two or three weeks I think; since then none have been shot, so I am unable to carry the data further.

The presence of this species along the coast of Southern and Lower California seems to be governed very largely by the food supply. They are common at any time, less so during the breeding season, when many are in the burrows during the day,—and vastly more abundant in late July, August, and September when they follow the large schools of herring and other small fish that come in shore at that season.

They are often seen in flocks of several thousands where fish are plenty. On one occasion I met with a flock on the coast of Lower California that I estimated contained not less than 50,000 Shearwaters. Many were so gorged with herring that they could not rise from the water, but flapped along the surface in advance of the steamer until nearly overtaken when they would dive. They would usually come up near enough to the vessel to be, if anything, more frightened than before, but could not take wing until they had disgorged a quantity of half digested fish, after which they flew off with apparent ease. It is only during very calm weather that this species is seen resting on the water. At such times they collect in very compact flocks, covering the water till there is but little room left within the circle that they almost invariably form. The first gentle breeze will start them on their journey again, and I have learned to have confidence in a breeze that starts them flying, for as far as my observations go they only rise if the wind is to be continuous, and will pay no attention to a gentle puff that will die out in a few minutes.

None of our Pacific coast seabirds adhere so closely to

established fly lines¹ as do the three species of *Puffinus*; even when flying fifty miles or more from land the first flock that passes will, with almost absolute certainty, mark the line which the next will follow, even though they be an hour behind. And I have long since discovered that in order to secure specimens of these shy species the boat must be placed in their fly lines. A flock will, on encountering a skiff, directly in their path, either divide and pass on either side or all swerve slightly to one side, immediately resuming their line of travel in either case. At times, however, they are easily turned from their course.

On January 23, I was drifting in a skiff off Point Loma, watching the Black-vented Shearwaters which were flying south along the western edge of an extensive bed of kelp. A garbage scow had sailed out through the kelp an hour before, leaving a broad oily 'slick' a hundred yards in width, extending two or three miles westward, at right angles to the course taken by the Shearwaters, which were passing in small flocks of four or five to a dozen every ten or fifteen minutes. Each flock turned sharply about when at a distance of a hundred yards from the oily water, and keeping at about that distance and to the windward, hurried on toward the west. *Not one bird* did I see cross contaminated water. I could detect no odor from the oil nor could the birds, had any existed, for they were flying down the wind.

I have never seen Black-vented Shearwaters pay any attention to bait or refuse thrown from the ship's galley, though Dark-bodied, Pink-footed, and Slender-billed Shearwaters will light to pick up floating garbage.

Though all of our Shearwaters prefer to keep rather well off shore, they will at times follow schools of small fish into shoal water. I once saw a flock of one or two hundred Black-vented Shearwaters feeding in the surf at Cape Colnett. Hovering over the advancing breaker they followed it to the beach, returning to meet the next, plunging repeatedly into its foamy crest for some species of small fish. They evidently did not feel at home so near land, for after a few minutes fishing they hurried out to sea again.

¹ In this connection see Mackay on 'Fly Lines,' Auk, Vol. X, p. 245.

A complete molt of all the feathers occurs in July and August in this species (*P. opisthomelas*),—and a more or less complete molt of the feathers of the head and body takes place in January and February. *P. griseus* and *P. creatopus* also, I think, undergo a complete molt in July and August, but whether they share with *opisthomelas* a partial molt in early spring, I am unable to say from lack of material taken in proper season.

At times when I have found a pronounced flight of Shearwaters near shore I have usually if not always found a flight in the opposite direction farther at sea. This habit of flying in circles or advancing in a series of loops, is very noticeable when the birds are quartering the sea for small fish. Their circles are then often small enough to enable one to see the entire circuit. I recently made mention of this habit in a letter to Mr. Chase Littlejohn and his reply, which lies before me, will bear quoting from. He says: "During the summer there are untold thousands of them in Alaska and they are not rare in winter. Your remarks about the direction the Shearwaters flew interested me very much, and bring to mind facts that I had not thought of for some time. I think had it been possible for you to have followed a flight for a few hours you would have found yourself back where you started, for my belief is that *flocks* almost always, if not invariably, fly in circles, moving for hours, and even days in the same vicinity; and then again, travelling in a given direction, but still in circles. I have many times been at or near the center of a ring when it was just possible to see the birds in any direction, and from that down to circles only a few hundred yards in diameter. When we know that they fly in circles as far as the eye can see, is it not reasonable to think that they might extend it for a much greater distance and move south in-shore while, as you say, they were going north off-shore."

Mr. Littlejohn's notes on the Alaskan birds refer to the Slender-billed Shearwater, but are pertinent as I have found the flight very similar in all of our species.

RECENT OBSERVATIONS ON *HISTRIONICUS HISTRIONICUS* IN MAINE.

BY ARTHUR H. NORTON.

IN THE month of February, 1894, the writer spent several days on some of the outermost islands of Penobscot Bay, for the sole purpose of observing and collecting winter birds, and more especially to observe this species in life. I was accompanied by Mr. Fred Rackliff, a man admirably qualified for the work before us, he being an expert surfman, thoroughly acquainted with the region we had chosen, and a skilful ornithological collector. Had I been otherwise attended, my efforts in this connection would have been futile, owing to the sudden and violent changes of weather and sea on this coast in winter, and to the distance and roughness of the islands where we were to perform our labors.

Our departure was made from the main on Feb. 2 at 2 P. M., with a light westerly wind and smooth sea, we arriving at our first station about sunset. This was an island two miles in length, reduced by the sea to a ledge. At this place we had little hope of finding Harlequins, as I was told that there was but a single 'gutter' here, where the birds had been found with any regularity. Our objective point was an islet lying half a mile away which I was assured was the chief resort of these birds in this vicinity ten years earlier, when they could always be found, in winter around a particular arm of water or gutter, formed at low stages of the tide, on the outermost and roughest part of the islet.

For several days following we were greatly hampered in our movements by stormy weather, and not until the morning of Feb. 6 did we see our first Harlequins. On this morning the wind and sea were quite calm, the tide at about one hour of flood at sunrise, making the little niche alluded to a steep-sided, narrow cove into which the sea was but gently breaking. Very shortly after sunrise we saw a flock of eight Harlequins heading for it, with a swift, straight flight, and without a pause they dropped into the surf near it. We had already left the place, and witnessed this flight from a distance, but we quickly returned, and fastening our boat crept forward over and among the ragged rocks until we saw them

plainly, when we paused to watch them. They were well into the gutter, in a compact group and evidently had just finished feeding, as they now commenced drifting out, resting on the water as lightly as gulls. One would rise on its tail to flap its wings and settle back to shake its plumage, when the act would be repeated by another, the whole flock turning around and around, in a leisurely way, with such perfect ease that no effort was appreciable.

Before we were within gun-shot, a Black-backed Gull came high in the air, and as quickly as his sharp eye beheld us, he gave two or three guttural notes, whereupon every duck leaped to wing and without a pause flew directly back over the route by which they came, fading from view in the distance. From the course they had followed we had no doubt, that they had been driven from an isolated ledge lying two and a half miles to sea, by a lobster man whom we saw, and that they returned to it. And from the fact, that we found none of them around these islands, and that the lobstermen living here and passing the islet several times each week had seen but one flock of seven birds during the winter, I am confident that they were located at this ledge. On account of its exposed position, and lack of good landing places, we may hope that they are secure for some time to come.

The day was so calm that we decided to move to the next islands, two ledgy masses lying five miles to the eastward. Both were destitute of trees and shrubs, the largest, about seventy acres in extent, being the headquarters of two parties of lobster-fishers, whose hospitalities we were glad to accept, as there was no shelter for our tent. Shortly after noon the wind breezed from the southwest and increased steadily throughout the afternoon. The following morning we found a gale blowing from the same point, and the sea breaking a hundred yards from the tide mark. Just above the demolishing force of the waves great windrows of sea froth, charged with a gray slime were heaped, often rolling before the wind, or breaking into fragments and flying. Several times I was buried to the shoulders in the driven mass. When this reached the snow line, the water was quickly absorbed leaving the scum at the surface. A few hundred yards from the windward shore of the 'Big Island'

was a ledge submerged at high water, but at low stages of the tide connected with the island by a line of rocky reef. Thus a small bay was formed, several acres in extent, having at high tide a considerable depth, except at its edges, where its great billows were breaking during the period of high water.

At about 9 A. M. we saw a flock of not less than thirty Harlequins in this bay. Though they were beyond gunshot of the shore, I had ample opportunity to watch them, as they remained until about 3.30 P. M., when the tide was so low that the sea broke before entering the bay. Near at hand were numbers of Eiders and Scoters, rendering comparison easy.

The Harlequins were attracted to the largest billow, one which surged high and sharp, and broke about fifty yards from the reef where its force was spent. For considerable intervals the ducks would sit facing the wind, but not advancing, slightly removed from the fury of the breaker. Then drawing nearer to it they would dive to feed. Frequently all would be under at once, but this diving seemed to depend slightly on the action of the sea, as a portion of the flock, apparently not ready to dive on being threatened by a breaker, would plunge into it, only to rise after some time had elapsed. After a few plunges they would rest on the surface of the water, usually in the path of the great breaker, apparently in mere wantonness. Now they were in little groups scattered parallel with the length of the wave, awaiting the rushing flood. From my position I could not observe the slightest sign of concern in them as it approached. As it rushed over the inequalities of the bottom its crest began breaking at corresponding intervals. High above them it topped, and as its crest broke in white foam, the little ducks plunged headlong into its front, almost instantly reappearing in its train, while perhaps others a few feet from them, with unerring calculations, would ride over an unbroken part as lightly as bubbles. It was here that this beautiful lightness of body was shown to be an important feature in their economy.

In all the time that I watched them none plunged into the breaker until its crest was foaming. At this pastime they spent considerably more time than they had in feeding, and when seemingly satisfied they swam to a smooth position to rest facing

the wind, or a few would pay a visit of inspection to the Eiders and Scoters, quickly returning to their own kind. Then all would return to feed or frolic in the breaker.

The following day the wind and sea were sufficiently moderated to make landing on the little island possible, an opportunity which we improved early in the day. This island, I was told, formerly afforded the birds a favorite resort, and many crevices were pointed out to me as their old-time haunts. On this occasion we found but a single flock of nine birds, resting idly on the water, off the mouth of one of these crevices. We waited for some time, but they drifted farther out.

The next morning, February 9, was very calm and we went to a large off-lying ledge a mile away and set decoys for ducks. Shortly after sunrise a pair of 'Ladies' came and lit in a shallow cave, where they paused but a moment, and then flew away. About half an hour later a grand flock of thirty or forty came in sight heading for us, but when about a hundred yards away, for some cause they sheered off to the west, disappearing in the distance, not stopping at either of the islands. As they passed us away from the sun, the light was perfect, making the adult males, which constituted a good portion of the flock, very conspicuous. The flock was compact, the birds moving swiftly, about ten feet above the water, with very quick wing strokes, their dashing manner and lightness of flight suggesting *Passerine* birds.

Shortly before noon of the same day we went to the little island and again found the nine birds at the same place where they had been observed the day before, this time very close to the gutter. They were warned of our presence by a Black-backed Gull, not, however, before we were within a very long shot of them and five fell at a single discharge. All appeared to be young males, in changing plumage. An example now at hand has the worn and faded feathers of the old dress, and the fresh, bright ones of the new showing in various parts of it, but most conspicuously in the upper tail-coverts and the tail, where the contrast is great. The two middle tail-feathers and upper tail-coverts, except three feathers scattered among the new, are of the new plumage, unworn and of a glossy blackish, while the

rest of the tail and the rump are of the old plumage, worn and faded to a dull, grayish brown shade.

Compared with the other ducks of this coast, with which their habits often throw them in life, the combination of small size, dark color and buoyancy, in air or water, is distinctive. *Somateria* and *Oidemia* are heavy, at rest or in flight, though none but small examples of *O. americana* approach *Histrionicus* in size. The color is at once sufficient to distinguish it from *Clangula hyemalis*, when they are together on this coast.

Mr. Rackliff pointed out numerous gutters, where he said that when a youth he had seen the 'Sea-mice' crowding in, when sad havoc was often made among them by the boy gunners. The older gunners seldom made effort to take them, as they were of small value. They were very easily plucked of their feathers, a fact which made them an object of playful contests at the plucking of the day's gunning.

In speaking of these birds he commonly called them Sea-mice; and in answer to my question, said that they made a squeaking note like mice, and thus received that name among the gunners of that vicinity. He also said that they were very playful in their actions, frequently flying in to a chosen resort to drop into the water and, without a decided stop, resume their flight to another quarter; or they would fly in and dive from the air, reappearing on the wing and away again. (For another note on their playfulness, see Dutcher, Auk, Vol. III, p. 434.)

The birds are known to fly to a great height. (See Pennant, Latham, and Wilson.) This is a habit probably not observed on this coast in winter, and might be doubted by those observing only the winter birds; fortunately, however, Audubon has shown that this is a habit in flying over the land, under which conditions they were probably observed by Pennant or his observers.

That the species is gregarious under favorable conditions is ably attested. (Audubon, Elliot, and Stejneger.) I believe that I am correctly informed concerning its voice, at least during its abode on this coast.

As to its breeding on the coasts of Maine and Nova Scotia in early days I have no more evidence than other ornithologists, but as regards the subject of breeding and family cares, I regard

Audubon's account of this species as delightfully accurate. Of published information relating to this species in Maine, that of "W. B." appears to be the most comprehensive, namely: "The Harlequin Duck is regularly common in winter on the coast of Maine, where, however, its distribution seems to be very local." (Bull. Nutt. Orn. Club, VIII, p. 163.) To which I would add: Common only to the eastern half of the coast, where it is steadily but slowly decreasing.

Finally, I believe that there are three things favorable to this bird's holding its range: (1) The lateness and severity of the season when it is here. (2) The roughness and inaccessibility of the places to which it is now restricted. (3) The abundance and vigilance of the Gulls.

SOME NOTES ON THE PASSENGER PIGEON (*ECTOPISTES MIGRATORIUS*) IN CONFINEMENT.

BY RUTHVEN DEANE.

IN THE 'American Field' of December 5, 1895, I noticed a short note, stating that Mr. David Whittaker of Milwaukee, Wis., had in a spacious enclosure, a flock of fifty genuine Wild Pigeons. Being much interested of late in this bird, I at once wrote to Mr. Whittaker, asking for such information in detail regarding his birds as he could give me, but owing to absence from the city, he did not reply. Still being anxious to learn something further regarding this interesting subject, I recently wrote to a correspondent in Milwaukee, asking him to investigate the matter. In due time I received his reply, stating that he had seen the Pigeons, but that the flock consisted of fifteen instead of fifty birds, and inviting me to join him, and spend a few hours of rare pleasure.

On March 1, 1896, I visited Milwaukee, and made a careful inspection of this beautiful flock. I am greatly indebted to Mr. Whittaker, through whose courtesy, we saw and heard so much of

value and interest, not only in regard to his pet birds, but also about his large experience with the Wild Pigeon in its native haunts; for being a keen observer of nature, and having been a prospector for many years among the timber and mining regions of Wisconsin, Michigan and Canada, his opportunities for observation have been extensive. In the fall of 1888, Mr. Whittaker received from a young Indian two pairs of Pigeons, one of adults and the other quite young. They were trapped near Lake Shawano, in Shawano County in northeastern Wisconsin.

Shortly after being confined, one of the old birds scalped itself by flying against the wire netting, and died — the other one escaped. The young pair were, with much care and watching, successfully raised, and from these the flock has increased to its present number, six males and nine females. The enclosure, which is not large, is built behind and adjoining the house, situated on a high bluff overlooking the Milwaukee River. It is built of wire netting, and enclosed on the top and two sides with glass. There is but slight protection from the cold and the Pigeons thrive in zero weather as well as in summer. A few branches and poles are used for roosting, and two shelves, about one foot wide and partitioned off, though not enclosed, are where the nests are built and the young are raised. It was several years before Mr. Whittaker successfully raised the young, but by patient experimenting with various kinds of food, he has been rewarded. The destruction of the nest and egg, at times by the female, more often by others of the flock, and the killing of the young birds, after they leave the nest, by the old males, explains in part the slow increase in the flock. When the Pigeons show signs of nesting, small twigs are thrown on to the bottom of the enclosure, and on the day of our visit, I was so fortunate as to watch the operations of nest building. There were three pairs actively engaged. The females remained on the shelf, and at a given signal which they only uttered for this purpose, the males would select a twig or straw, and in one instance a feather and fly up to the nest, drop it and return to the ground, while the females placed the building material in position and then called for more. In all of Mr. Whittaker's experience with this flock he has never known of more than one egg being deposited. Audubon in his

article¹ on the Passenger Pigeon says: "A curious change of habits has taken place in England in those Pigeons which I presented to the Earl of Kirby in 1830, that nobleman having assured me that ever since they began breeding in his aviaries, they have laid only one egg." The eggs are usually laid from the middle of February to the middle of September, some females laying as many as seven or eight during the season, though three or four is the average.

The period of incubation is fourteen days, almost to a day, and if the egg is not hatched in that time, the birds desert it. As in the wild state, both parents assist in incubation, the females sitting all night, and the males by day. As soon as the young are hatched the parents are fed on earth worms, beetles, grubs, etc., which are placed in a box of earth, from which they greedily feed, afterwards nourishing the young in the usual way, by disgorging the contents from the crop. At times the earth in the enclosure is moistened with water and a handful of worms thrown in, which soon find their way under the surface. The Pigeons are so fond of these tidbits, they will often pick and scratch holes in their search, large enough to almost hide themselves.

When the birds are sitting during cold weather, the egg is tucked up under the feathers, and the primaries of one wing are drawn under the body as though to support the egg in its position. At such times the Pigeon rests on the side of the folded wing instead of squatting on the nest. During the first few days, after the young is hatched, to guard against the cold, it is, like the egg, concealed under the feathers of the abdomen, the head always pointing forward. In this attitude, the parents, without changing the sitting position or reclining on the side, feed the squab by arching the head and neck down, and administering the food. The young leave the nest in about fourteen days, and then feed on small seeds, and later with the old birds subsist on grains, beech nuts, acorns, etc.

The adults usually commence to molt in September and are but a few weeks in assuming their new dress but the young in the first molt are much longer. At the time of my visit the birds

¹ The Birds of America, original edition, Vol. V, 1842, p. 32.

were all in perfect plumage. The young in the downy state are a dark slate color.

The Pigeons are always timid, and ever on the alert when being watched, and the observer must approach them cautiously to prevent a commotion. They inherit the instincts of their race in a number of ways. On the approach of a storm the old birds will arrange themselves side by side on the perch, draw the head and neck down into the feathers and sit motionless for a time, then gradually resume an upright position, spread the tail, stretch each wing in turn, and then, as at a given signal, they spring from the perch and bring up against the wire netting with their feet as though anxious to fly before the disturbing elements. Mr. Whittaker has noticed this same trait while observing Pigeons in the woods.

It was with a peculiar sense of pleasure and satisfaction that I witnessed and heard all the facts about this flock, inasmuch as but few of us expect to again have such opportunities with this Pigeon in the wild state. It is to be hoped that, if Mr. Whittaker continues to successfully increase these birds, he will dispose of a pair to some of our zoölogical gardens, for what would be a more valuable and interesting addition than an aviary of this rapidly diminishing species.

NOTES ON THE BIRDS OF BERMUDA.

BY D. WEBSTER PRENTISS.

BULLETIN 25 of the United States National Museum, on the Natural History of Bermuda, contains some remarks on Bermudian Birds. Since its publication in 1884 two species have been added to the Bermudian Fauna, namely the Mockingbird and the European Goldfinch.

1. *Mimus polyglottos*.—Six pairs of the American Mockingbird were liberated at St. George's in 1893, by Capt. Myers, the German Consul. I have not seen any of them in the neighborhood of Walsingham, but from

the climate, and habits of the bird, there seems to be no reason why in a few years, it should not be as abundant as its near relative, the Catbird, now the most abundant bird on the island, except the English Sparrow.

2. *Carduelis carduelis*. THE EUROPEAN GOLDFINCH.—A number of these birds escaped from a vessel at St. George's in 1893, and have multiplied rapidly, until now they are quite common about Walsingham and Poynter's Vale. Have seen a flock of twenty-five or thirty. They make a very attractive addition to the Bermudian Fauna.

It may be of interest to note the six common resident birds of Bermuda, which include about the only birds seen in the winter.

1. *Vireo noveboracensis*. WHITE-EYED VIREO.—Called "Chick of the Village." Very common and very familiar, coming about the house on the rose-bushes and arbors, as also do the Catbirds. A 'Chick' flew into my room through the open door a few days since, and I caught it at the window. It seemed quite fearless and pecked at my finger, as I smoothed it before giving it its liberty. They are in full song during the winter.

2. *Cardinalis cardinalis*.—Very common and fearless. They come into the chicken yard when the chickens are fed and contest with the Sparrows for a portion of the meal.

It is a beautiful sight to see them hopping about the green lawn, together with Bluebirds and Catbirds, and would be still more attractive but for the presence of the ubiquitous English Sparrows. The Redbirds began calling about the middle of February, and now, March 1, are heard in all directions. The note is a little different from that of birds about Washington, D.C., being less robust. There are two distinct whistles—the *Wee-do, wee-do, wee-do*, and the *Phee-a, phee-a*—the latter quite plaintive.

3. *Sialia sialis*.—The Bluebird is also very abundant, but I am told not so much so as formerly. No reason is known for the decrease in numbers unless it is that their nests are broken up and the young destroyed by the English Sparrows. It is possible also that the tree rats (*Mus tectorum*), which build their nests in trees may destroy the eggs and young of the Bluebirds. The notes of the Bluebird also differ from those in the States. They have a general similitude but are not so low, are plaintive and more varied.

I am told by Mr. U. S. Peniston that the Bluebird gives notice of the approach of a hawk by a peculiar long drawn whistle, and that chickens hearing it scurry to shelter. The Bluebirds seem rather smaller than in the States, and the colors deeper.

4. *Galeoscoptes carolinensis*.—The Catbird is everywhere;—along the roads, in the gardens, coming fearlessly to the porches; in the myrtle thickets—in short, ubiquitous. It is not so much of a favorite as the others mentioned, perhaps on account of its sober colors, but

more because of its depredations on small fruits, especially the Loquat plum. Its note, the 'mew,' is also less vigorous than that of the American bird—is more quiet and subdued. They are not yet in song (March 1).

5. *Columbigallina passerina*.—The Ground Dove is also very abundant, being constantly seen feeding along the roads. It is more timid than the birds previously mentioned, but when feeding in the old fields, one can walk quite close to them without their taking alarm.

6. *Passer domesticus*.—The English Sparrow is as aggressive, offensive and despised here as in the States. They were introduced some years ago and in a climate without winter, propagate prodigiously. An attempt was made to check their increase by a bounty for the birds and their eggs of six pence a dozen, but it cost the government so much, £800 in one year, that it was abandoned, while its destruction apparently made no difference in the number. They are most cordially hated by the Bermudians for several reasons:—they foul the eaves and verandahs of the houses, eat up the chicken feed, destroy the fruit—especially grapes and the Loquat, and last but not least, antagonize the native birds. I have been told of instances of their taking possession of the hole occupied by Bluebirds and destroying the rightful occupants.

Fortunately the Sparrows do not rest much on the roofs of houses, or they would pollute the water supply. The Bermudians depend entirely upon rain water for their supply. The houses are tiled with thin slabs of stone and kept white-washed to secure pure water. Birds frequenting the roofs would be very objectionable.

I have seen no domestic pigeons here though I believe there are a few in Hamilton.

7. As another nuisance ornithologically may be mentioned the Crow—introduced some twenty years since. They became very numerous and did so much damage to the crops, especially the Indian corn, and by killing young ducks and chickens, that a bounty of half a crown (60 cts.) was put on their heads. This has almost exterminated them—a small flock of five in the neighborhood of Walsingham being all that remains.

8. The Kingfisher (*Ceryle alcyon*) presents a familiar and handsome appearance, especially around the shores of Harrington Sound. The bird however is not a favorite. The squid is the best bait for fishing and are very scarce. I heard a fisherman charge the scarcity to the Kingfishers—they being especially fond of squid. So also in the Aquarium of beautiful fish—angel fish, turbot, parrot fish, etc., at Mrs. Allen's at Flatt's Village. Many young fish of these species were added, but were said to be eaten by the Kingfishers. Perhaps the latter, however, were not wholly to blame, for one morning a Blue Heron was found perched reflectively over the pond.

9. Lastly permit me to mention the picturesque Tropic Bird (*Phaëthon flavirostris*), a prominent and interesting feature of the landscape, from the first of March until October, with its single long tail feather, dashing

and wheeling over the waters. They were formerly greatly more abundant, but from the wanton destruction both of the birds and eggs, their numbers are much reduced. Now, however, the destruction of both birds and eggs is forbidden by law, and it is to be hoped they will again become numerous. This year the advance guard arrived February 28,—rather earlier than usual. On this date I saw them for the first time at the 'Ferry' between the islands of Hamilton and St. George; forty or fifty were circling around and examining the rocky cliffs as though selecting their breeding places. The Tropic Bird is popularly called the 'Bo'sin Bird.'

RECENT LITERATURE.

Stone on the Molting of Birds.¹—In this paper the author has given the results of considerable personal work and experience. The paper consists of two parts, the first being "a general account of the methods of plumage change," and the second, "brief accounts of the molts and seasonal plumages of most of the smaller land birds of eastern North America, from the Cuckoos through the Passeres in the order of the American Ornithologists' Union Check List." The trouble attending the bringing together of even an incomplete series, and consequent difficulty in determining the exact changes occurring in many plumages, are duly set forth, and our author is careful to state that "no doubt alterations will have to be made in my accounts of the molt in several species, in the light of future investigations." Under 'Change of Color by Abrasion,' and 'Direct Change of Color in Feathers,' the results of investigations made with the assistance of Dr. A. P. Brown are given, with illustrations. The changes of plumage in the Snow Bunting, Dunlin and Sanderling are pointed out and commented on, this work having been done without knowledge of Mr. Chapman's recent efforts in the same line. The views of Mr. Chapman are fully indorsed and those of Herr Gätke correspondingly disproved. The only instance known to our author "of an actual change of color in the plumage, except by fading, is in the case of certain delicate pink tints on the breasts of gulls." Certain opinions of Drs. Stejneger and Sharpe regarding the changes of color in *Motacilla lugens* and *Zanthopygia narcissina* and

¹ The Molting of Birds with Special Reference to the Plumages of the Smaller Land Birds of Eastern North America. By Witmer Stone. Proc. Acad. Nat. Sci. Phila., 1896, pp. 108-167, pll. iv and v.

Z. tricolor are also given, commented on, and to some extent controverted.

The bulk of this paper of 59 pages is taken up with statements and discussions of the plumage conditions and molts of 135 species belonging to 22 families of our commoner land birds. In some, a line or two suffices for the purpose, to others considerable space is devoted, while in the cases of the Rose-breasted Grosbeak and Scarlet Tanager, several pages for each are given up to original and extremely interesting descriptions of the various plumage phases assumed by these birds. Under 'Order of Molt' the sequence of the growth of new feathers and also the wearing, are not only well discussed but are well illustrated by seventeen figures in two plates.

Mr. Stone tabulates the results of his investigations under six generalizations as follows:—"I. The annual molt at the close of the breeding season is a physiological necessity and is common to all birds. II. The spring molt and striking changes of plumage effected by abrasion are not physiological necessities and their extent is dependent upon the height of development of coloration in the adult plumage, and does not necessarily bear any relation to the systematic relationships of the species. III. The amount of change effected in the plumage at any particular molt varies considerably in different individuals of the same species and sex. IV. Some species which have a well marked spring molt in their first and second years may discontinue it afterwards, when the adult plumage has once been acquired. And, on the other hand, some individuals may continue to molt in the spring, while others of the same species cease to do so. V. The remiges are molted less frequently than any other part of the plumage. As a rule, they are only renewed at the annual molt (exception, *Dolichonyx*). VI. Variability in the order of molt in the remiges and presence or absence of molt in the flight feathers at the end of the first summer are generally family characters," etc. Objections might be made to some of the above. Thus, *Spinus tristis* and *Ammodramus sandwichensis savanna* are equal, in the adults at least, in the extent of the spring molt, but the change is hardly "dependent upon the height of development of coloration in the adult plumage," for in one a total change of color takes place, whereas in the other there is little more than a replacement of feathers by others of the same color. Again, has our author seen a sufficient number of specimens of molting second year birds of undoubtedly correctly determined age, to warrant the statement that they have a "well marked spring molt?" Also, when some individuals of a species molt in the spring and others do not, is it not because the former are immature and the latter adult?

With such an extensive self-imposed task and the necessarily large amount of material and conditions examined, it would be perhaps too much to expect that our author would always 'hew to the line,' but the lapses detract little from the merits of this important paper on a hitherto almost neglected branch of American ornithology. Most of those that do

occur are due to lack of complete series showing all grades of changes and which in many cases were not seen by the writer, or still remain to be collected before one can be sure of knowing how and when changes occur. If collectors would save their worn and molting specimens instead of throwing them away as 'worthless,' changes of plumage would be far better known.

Our author's selection of the words, "first winter, and nuptial," to indicate certain conditions of plumage seems unfortunate, for several reasons. In some cases "nuptial" indicates a plumage condition and colors, obtained wholly by wearing, in others the same word designates plumages obtained partly or entirely by molt, and again in others by a combination of molt and wear. All birds have these seasonal changes, yet differ in the process and time of changing; therefore it would seem that a better formula is necessary by which to designate those instances where the same seasonal comparative conditions are obtained by entirely different physiological processes. These words are used for such birds as *Spinus tristis* which has a double molt, and also for *Plectrophenax nivalis* which has but one; also for *Junco hyemalis*, *Melospiza fasciata*, *Scolecophagus carolinus*, *Cistothorus palustris*, and others, which differ considerably not only in the nature and extent of the molt, but also as to the time of plumage change; and the matter is further complicated by the fact that the immature birds of many species molt at different times from the adults, some in the fall, others in the spring, even differing as to the parts of the plumage affected. For instance, the young Song Sparrow obtains a new tail in the fall. One specimen taken Sept. 13, another taken Nov. 6, have new central feathers, and I have watched a live one completely renew its tail. A *Cistothorus palustris* on April 15, is molting all except the remiges and the tail is half grown. A Savanna Sparrow, May 6, is similar, but the outer rectrices are still in place and most of the secondaries and tertials have been renewed. Two Henslow's Sparrows, same date, have the central tail-feathers just appearing; in one ten, in the other seven old feathers are still in place. Two Indigos, Sept. 1, and Oct. 2, have not only molted their tail-feathers but have also nearly completed the new wing feathers. All the above are immature birds, and the Henslow's are molting nothing except the tail. It is hardly safe to say that these nestling rectrices were lost by accident.

No mention is made of the spring molt of immature *Agelaius phoeniceus*. In the female this is one of the least extensive of our birds, being confined to the throat, around the eyes and along the superciliary stripe. Under *Dendroica caerulescens* occurs a *lapsus calami*, where our author speaks of the white edging of the throat feathers of "fall adults." These are birds of the year, as is readily proved by their osteology.

Much work remains to be done before we can understand the changes and conditions of even our most common birds; the difficulty is great and success uncertain, owing chiefly to the fact that no individuals as such are resident with us but migrate extensively.

Mr. Stone deserves great credit for the present paper, which is a good basis on which to build a better knowledge of plumage changes. Such work is tending rapidly to disprove the many guesses formerly so common but now gradually being displaced by the results of unbiased, systematic study.—W. P.

Stone on Birds collected in North Greenland.¹—Mr. Stone gives an annotated list of the birds "obtained by the Peary party during their sojourn in North Greenland from July, 1891, to August, 1892, and also of those collected by the Relief Expedition of 1892." They consist of 122 specimens, besides numerous nests and eggs, part of which were collected by Mr. Langdon Gibson in the vicinity of Peary's winter quarters, and the remainder by Mr. Charles E. Hite, at various points from Disko to Cape York. The two collections number 19 species each, and collectively represent 28 species, only a part of the species being common to both collections. The annotations give the localities, and generally the dates, of the specimens obtained, with occasionally further notes of interest. No species are added to the Greenland fauna, but the breeding grounds of *Chen hyperborea nivalis* appear to be for the first time here made known.—J. A. A.

Schalow on a Collection of Birds from West Greenland.²—In 1892 the Geographical Society of Berlin sent an expedition to West Greenland, under the direction of Dr. von Drygalski, which was accompanied by Dr. Vanhöffen as naturalist. The region explored extends from latitude 69° to 73°, and the expedition remained in the field from May, 1892, to October, 1893. The birds collected number 29 species, of which 12 are represented only by eggs. Dr. Schalow, in his report upon this collection, includes also notices of a number of additional Greenland birds' eggs contained in the collection of Major Krüger-Velthusen; some 35 species are thus formally noticed, with passing remarks on a number of others. Many field notes are given, apparently extracted from Dr. Vanhöffen's previously published observations,³ with many technical notes on various species. While the collection gathered by Dr. Vanhöffen added no species to the Greenland fauna he reports seeing a skin of *Tadorna casarca* [= *Casarca casarca* (Linn.)] in a small collection of bird's skins made at Augpalartok, in the District of Upernavik, which was collected

¹ List of Birds collected in North Greenland by the Peary Expedition of 1891-92 and the Relief Expedition of 1892. By Witmer Stone. Proc. Acad. Nat. Sci. Philadelphia, 1895, pp. 502-505.

² Ueber eine Vogelsammlung aus Westgrönland. Von Herman Schalow. Journ. für Orn., Oct., 1895, pp. 457-481.

³ "Frühlingsleben in Nord-Grönland (Verhandl. Ges. für Erdkunde zu Berlin, XX, 1893, pp. 454-469)."

in that vicinity in 1892. Dr. Schalow thinks it could not have been derived by exchange from any foreign source. Besides, in that same year several specimens of this southeastern species were taken in Iceland; it has also been taken repeatedly in Sweden and Norway, and there seems to be also still another record for North Greenland.¹

Dr. Schalow also incidentally notes the fact of the occurrence of *Anser segetum* [= *Anser fabalis* (Lath.) Salvad.] in North Greenland, as recorded by Winge,² who reports a Greenland specimen as existing in the Zoölogical Museum of Copenhagen. This adds two Old World species to the Greenland fauna in addition to those given in the A. O. U. Check-List.—J. A. A.

Rotzell's Birds of Narberth, Pa., and Vicinity.³—This is a briefly annotated list of 108 species. It does not profess to be a complete list of the birds of the limited area of which it treats, but is excellent as far as it goes, giving briefly just the information most desired in a local list. It includes only such species as have been personally noted by the writer, and forms a good point of departure for further additions, which the author solicits aid in making. He says that he has "refrained from recording any except those that are well authenticated, preferring that future observations should add to the list rather than take from it"—a rule compilers of local lists would do well to always follow. The list is printed with good taste and presents an attractive appearance.—J. A. A.

Rhoads's List of Tennessee Birds.⁴—Mr. Rhoads's list is not limited to the species observed by him during his recent trip through the State (in May and June, 1895; see Proc. Acad. Nat. Sci. Phila., 1895, pp. 376-380), but is intended to comprehend all the birds of which we have any record as now inhabiting or formerly occurring in the State." The literature bearing on the subject is scanty, consisting chiefly of Dr. W. H. Fox's two papers, recording 116 species, a fragmentary list by Dr. F. W. Langdon, and some notes on the birds of the Great Smoky Mountains by 'Lemoyne,' numbering altogether 134 species and sub-species. This number is increased by Mr. Rhoads to 215, of which "10 are of doubtful record or identity, although they all belong to the Tennessee fauna."

¹ Winge, Vidensk. Meddel. naturh. Foren. Kjobenhavn, 1895 (p. 63 of author's separata).

² *Ibid.*

³ Birds of Narberth, Pa., | and Vicinity. | — | By | W. E. Rotzell, M.D. | — | 1895. 800, pp. 8.

⁴ Contributions to the Zoölogy of Tennessee, No. 2. Birds. By Samuel N. Rhoads. Proc. Acad. Nat. Sci. Philadelphia, 1895, pp. 463-501. (December 11, 1895.)

Although the list includes no species whose occurrence in Tennessee is improbable, it is to be regretted that Mr. Rhoads should not have been content to record not only the "10 of doubtful record," but a few others also, as species of probable occurrence, without including them and numbering them as a part of his list. He could have given the evidence in such cases 'for what it may be worth,' and thus have saved giving to his list, to say the least, a very unscientific flavoring. So many such inclusions render it very far from a 'hard-and-fast' list. In fact we are surprised to see a writer of Mr. Rhoads's scientific ability and experience setting such a bad example in the matter of a local list.—J. A. A.

Short's Birds of Western New York.¹—Mr. Short's former list (see Auk, XI, 1894, p. 168), published in 1893, contained 207 species, one of which is here omitted, and to which 23 are now added, giving a total of 229 species in the present edition. The annotations respecting the rarer species are brought down to date. The typographical execution has been greatly improved, the list being for the most part neatly arranged and printed; towards the close the compositor seems to have run short of type, supplying the deficiency, in certain letters, from a smaller font. The list has evidently been prepared with care, and may doubtless be regarded as a trustworthy enumeration of the birds of the region to which it relates.—J. A. A.

A List of Nebraska Birds.²—This paper is primarily designed to give the residents of Nebraska some knowledge of the distribution, comparative numbers, and economic value of the birds which occur in their State. An opening chapter, 'Remarks about Birds in general,' treats of their relation to man and of their economic and esthetic importance. The list proper includes brief annotations on distribution and manner of occurrence, with, in some cases, remarks on the bird's food and its value to the agriculturist. Herein are recorded 415 species and subspecies. Of these *Xema sabinii*, *Sterna paradisæa*, *Tantalus loculator*, *Ammodramus caudacutus nelsoni*, *Sitta pusilla* and *Merula migratoria propinqua*, seem to have been introduced on insufficient evidence, while *Quiscalus quiscula*, *Acanthis linaria rostrata*, *Junco hyemalis oregonus*, *Lanius ludovicianus*, *Seiurus noveboracensis* are included as a result of evident misidentifications. Subtracting these eleven birds and we have

¹ Birds of Western New York. With Notes. By Ernest H. Short. Second Edition, 1896. Frank H. Lattin, Publisher, Albion, N. Y. 8vo, pp. 20.

² Some Notes on Nebraska Birds. A List of the Species and Subspecies Found in the State, with notes on their distribution, Food-Habits Etc. Corrected to April 22d, 1896. By Lawrence Bruner, Professor of Entomology and Ornithology, University of Nebraska. Rep. Nebraska State Horticultural Society, 1896, Lincoln, Neb. pp. 48-178, 51 cuts in the text.

left at least 400 species and subspecies, a larger number than has been recorded from any other State, except California, and nearly three-fourths of the total number of birds known from the Mississippi Valley. This unusually rich avifauna, as Professor Bruner remarks, is due both to the faunal position of Nebraska and to its diversified topography. — F. M. C.

Cory's 'Hunting and Fishing in Florida,' with 'a Key to the Water Birds of the State,'¹ — The strictly ornithological portion of the work, or the 'Key,' consists of pages 133-304, and is limited to a consideration of the Water Birds of Florida, beginning with the Grebes and ending with the Plovers. It is profusely illustrated with process cuts in the text, most of them very effective and pleasing, but a few show that they were made from specimens that were defective in respect to taxidermy. The key proper consists of a cut of the head (and sometimes of other parts, as the foot) of each genus treated with a few lines of text to each species, in which the distinctive characters are emphasized by the use of heavy type, followed by a reference to the page where the bird is later more fully described. What may be called the key proper, with its accompanying cuts and diagrams, occupies about fifty pages, and is followed by a descriptive list of the species, consisting of a brief but apparently sufficient diagnosis of each, and a short paragraph on the character of its occurrence in Florida. Nearly every species mentioned is illustrated with a cut of the head, often of both male and female where the sexes differ, or by a full-length figure, all original and prepared expressly for the present work. Says the author: "In preparing the present Key, I have striven to make it as simple and non-technical as possible, my object being to enable any one totally unfamiliar with birds to identify with comparative ease any species of Florida water-bird." Apparently his effort to make the way easy, even for the novice, should be successful.

Preceding the bird part is a chapter devoted to the snakes of Florida, in the form of a copiously annotated list. There is also an annotated list of the mammals of the State, evidently prepared with much care, in which we note that the Florida panther is characterized as a

Hunting and Fishing | in | Florida, | including a | Key to the Water
Birds | known to occur in the State. | By | Charles B. Cory. | Curator of the
Department of Ornithology in the Field Columbian Museum, Chicago;
Fellow of the | Linnæan and Zoölogical Societies of London; Member of the
American Ornithologists' | Union; of the British Ornithologists' Union;
Honorary Member of the | California Academy of Sciences, etc., etc. | Author
of | "The Beautiful and Curious Birds of the World," "The Birds | of the
Bahama Islands," "The Birds of Haiti and San | Domingo," "The Birds of
the West Indies," "A Naturalist in the Magdalen Islands," etc., etc. | For
sale by | Estes & Lauriat, | Boston, Mass. | 1896. Sm. 4to, pp. 304, 2 photo-
gravure plates, and about 200 cuts in the text.

new sub-species, under the name *Felis concolor floridana*. About twenty-five pages are devoted to an account of the Seminole Indians, and about one hundred pages to hunting and fishing in Florida. Various hunting and fishing trips are described, with numerous appropriate illustrations. This portion of the book has an important bearing on many points in natural history, and will doubtless be of special interest to the hunter and tourist. The work is beautifully printed and is altogether an elegant sample of book-making.—J. A. A.

Howe's 'Every Bird.'¹—This is another attempt to render the identification of bird easy, whether the birds be in the bush or in the hand. The scope of the volume is limited to "one hundred and seventy-three species of birds most often met with in New England, and the Appendix contains nearly all other birds known to occur within these states." The text is reduced to a minimum, the author depending largely on the outline drawings of head and foot as an aid to the student. A line or two is given to dates of arrival, distribution (in New England), haunts, and song under each species. About a page of space is allotted to each species, including the cuts. They are divided according to their haunts into 'Woodland Birds,' 'Marsh and Swamp Birds,' 'Beach Birds,' 'Ocean Birds,' etc. The book, however, lacks both a table of contents and an index.—J. A. A.

Artistic and Scientific Taxidermy.²—Any work which will aid in more clearly defining the difference between the art of taxidermy and the trade of taxidermy is to be welcomed. Of manuals containing elementary instructions in 'stuffing' we have had enough. The case of effigies over the drawing-room mantel may serve a decorative purpose, but its maker is no more worthy the name of taxidermist than the caster of plaster images is deserving of the title of sculptor.

¹"Every Bird" | A Guide to the Identification of | the Birds of Woodland, | Beach and Ocean. | With | one hundred and twenty-four line illustrations | by the author | Reginald Heber Howe, Jr. | [Associate] Member of the American Ornithologists' Union, Member of the Nuttall | Ornithological Club. | Boston : | Bradlee Whidden, | 1896. Sm. 8vo, | pp. viii, 192. Price, \$1.00.

²Artistic and Scientific | Taxidermy and Modelling | A Manual of Instruction in the Methods of Pre- | serving and Reproducing the Correct | Form of all Natural Objects | Including a Chapter on | The Modelling of | Foliage | By | Montagu Browne, F. G. S., F. Z. S., etc. | Curator of the Leicester Corporation Museum and Art Gallery ; | Author of 'Practical Taxidermy,' The Vertebrate Animals of Leicestershire | and Rutland, etc. | With 22 Full-page Illustrations and 11 Illustrations in Text | London | Adam and Charles Black 1896. [New York, Macmillan & Co., \$6.50] 8vo. pp. viii + 463.

It is only within recent years that publishers have felt warranted in giving the taxidermist an opportunity to adequately state his case, and the present work is one of the largest and most expensive that has appeared on this subject. The author has a respect for his art born of an evident appreciation of its possibilities. Furthermore his gifts as a writer enable him to present his methods clearly and we opened this sumptuous volume with a hope that it would prove a source of both information and inspiration to the taxidermic artist. But we were grievously disappointed. Mr. Browne claims originality for his methods, and doubtless no one will care to dispute him, but the conservatism which makes him so independent has prevented him from availing himself of the latest advances in his art. As a result his work is, in many respects, several years behind the times. For instance, the aid rendered the taxidermist by photography he considers "usually a great mistake"; for, he asks, with singular narrowness, "Would any taxidermist attempt to reproduce 'Animals in rapid motion' as shown by instantaneous photography?" Nevertheless as specimens of his own work he gives plates of a group of fighting tigers, and a Kestrel in the air, presumably about to strike its prey.

Arsenic is considered "quite useless" as a preservative and as a substitute we are given three formulæ, the first of which includes chalk, soap, chloride of lime and tincture of musk; the second, which is incidentally recommended "as an efficient substitute for snuff," contains tannin, red pepper, camphor, and burnt alum; while the third consists of alum and saltpetre. Finally, and fortunately, a thorough external dressing with alcohol and bichloride of mercury is insisted upon.

The chapter on collecting mammals and birds is doubtless addressed to the sportsman for not one word do we find on the modern methods of trapping which have practically revolutionized the study of mammals, while instead of the convenient and effective auxilliary barrels now used by all our collectors, we are told to secure two rifles and two shot-guns of different calibres.

Pages 107-160 are devoted to the skinning, casting and mounting of mammals, but the methods here recommended of mounting the skin on a cast made from the dead body, the relaxed muscles of which give anything but an accurate reproduction of the animal's form in life, is one that no scientific taxidermist will endorse, while the manner of inserting the tail-wire in the mannikin is, to say the least, primitive. Chapter VI (pp. 166-211) treats of "the skinning and setting-up of birds by various methods." According to our dogmatic author there is but one way of skinning a bird and that is "from under the wing"; to make the opening on the abdomen is denounced as the "practice of some primæval butcher." No absorbent is used while skinning, but plaster, a substance which should never be put on skins designed for study, is employed as a drier after washing. Collectors who, when in the field, are accustomed to shoot and make up from twenty to thirty birds daily, will be interested in Mr. Browne's method of making 'skins.' Each 'skin' should have the skull

filled with chopped tow, and the skull should be afterwards "thinly plastered over with soft clay." "The hollow bags of the wings" should also be filled with cut tow and the leg-bones wrapped with the same material. A false body of tow and wire should now be made, and when, after a complicated process, this has been introduced into the skin, the latter should be placed in a trough, or a paper band or strip may be used, a plan which is considered superior to wrapping in cotton. Of mammal skins, by the way, Mr. Browne has apparently never heard, for we do not find them mentioned in his work.

In mounting birds from skins no mention is made of the most important part of the whole process, that of scraping and separating the shafts of the feathers from the inside whereby the plumage regains much of its former fluffiness. For the rest the author mounts his birds much as do other taxidermists.

The chapters on casting and modelling reptiles, amphibians, and fishes, and on the reproduction of certain invertebrates, contain information which has not previously appeared in works on taxidermy, though the methods given are in use in similar or improved form by our leading taxidermists and modellers.

Chapter IX, on casting and modelling from natural foliage, flowers, etc., is largely based on the methods of Mr. J. H. Mintorn and Mrs. E. S. Mogridge, whose work is so well and so favorably known in this country. As such it will be welcomed by all taxidermists who appreciate the value of a proper setting for their work.

The excellence of this chapter gives us reason to regret that Mr. Browne did not avail himself of the discoveries of his fellow workers in other branches of his art, for while his book may stand as a complete exposition of his own methods and ideas, it can by no means be considered as an adequate treatise on artistic and scientific taxidermy.—F. M. C.

Witchell's 'Evolution of Bird-Song.'¹—Says the author: "However novel or otherwise may be the theories stated in this book, I can at least claim that, so far as I am concerned, they are absolutely original, all of them having been committed to writing, though in some instances, not under their present titles, before I consulted any person, or any book, in regard to them." The subject is treated in ten chapters, under the following headings: The origin of the voice; alarm-notes; the influence of combat; the call-note; the simplest songs; noticeable incidents connected with bird-song; the influence of heredity in the perpetuation of the cries of birds; variation in bird-voices, its cause and effects; the influence of imitation in relation to bird-song. An appendix gives 'Tran-

¹ The | Evolution of Bird-Song | with | Observations on the Influence of Mimicry and Imitation | By | Charles A. Witchell | Author of the Fauna of Gloucestershire | London | Adam and Charles Black | 1896 [New York : Macmillan & Co. Price, \$1.75.] 8vo, pp. x, 253.

scripts of music sung by Blackbirds, Thrushes, and Skylarks,' and a bibliography.

The 'evolution of bird-song' is a subject that easily lends itself to speculation; while there is ample basis of fact for the discussion of many phases of the subject, in some respects the field is open for the free use of the imagination. Our author in the main has held himself in good restraint, but of course many of his suggestions are necessarily founded on conjecture.

After recounting some of the facts regarding the vocal and other sounds emitted by nearly voiceless animals, such as newts, young frogs, serpents and tortoises, and Darwin's theory that voice originated in the involuntary contraction of muscles, through the excitement of fear or anger, he reaches the conclusion that we may consider "the voice to have been evolved from a toneless puffing, indicative of anger, or from snorts or grunts accidentally caused."

Alarm-notes are produced by the anticipation of danger, while further development of the voice is due to the influence of combat, developing notes of defiance or triumph. "The first call-notes of birds were probably mere adaptations of alarm-cries"; the simpler songs of many species were at first mere repetitions of call-notes. Proof of heredity is found in the family resemblances between the notes of allied birds, as the call-notes and songs of thrushes, etc., at points geographically widely separated. "It is probable that, speaking generally, the cries of birds which have limited voices are inherited, and that those of what are commonly called 'singing-birds' are perpetuated through the agency of mimicry"—not only of other birds' notes but of sounds produced by the elements, as "the moaning of the wind in hollow trees," "the murmurs and gurgles of rippling streams," and the sounds made by insects and quadrupeds. These are, in brief, the principal conclusions presented by the author of 'Evolution of Bird-Song.'

Mr. Wittchell is beyond question a keen observer of birds in life, and has given a large amount of time to the subject he here attempts to elucidate. The book is well written, and abounds in interesting and suggestive facts derived from the close study of birds in their natural haunts. Here and there, however, a speculative remark or suggestion might well have been omitted, as either too far-fetched or superfluous to his subject. The 'bibliography of the subject', is quite too general and incomplete to be satisfactory, and we miss from it a number of titles one would naturally expect to find in such a list. A reference like the following, for example—"Zoologist, The. A monthly publication, London"—is hardly the kind of bibliography one will be likely to commend who is in search of special papers relating to the 'Evolution of Bird-song.' He appears to have quite overlooked Mr. Samuel N. Rhoads's paper, entitled 'The Mimetic Origin and Development of Bird Language' (Am. Nat. XXIII, March, 1889, pp. 91-103), where he will find his theories and many of his conclusions anticipated by Mr. Rhoads.—J. A. A.

Harvie-Brown and Buckley's 'A Vertebrate Fauna of the Moray Basin.'¹—These two attractive volumes are a credit to any publisher in the excellence of their illustrations and in their typographical execution, while the matter they contain is well worthy of the elegant setting. The first half of Volume I is taken up with a very detailed account of the boundaries, 'water-sheds', and other physical features of the region, and their influence upon 'migration lines,' with numerous full-page photogravure illustrations of beautiful stretches of natural scenery. The next sixty pages are devoted to the Mammals of the region. The Birds naturally come in for a large share of space, occupying pp. 214-306 of Vol. I and pp. 1-228 of Vol. II, or rather more than half of the entire work. There is a colored plate of the chick of Pallas's Sand Grouse (*Syrnhaptes paradoxus*), from a specimen taken in the region under consideration, and various text and full-page photogravure plates, appropriately illustrate this part of the work. Then follows an account of the Reptiles (4 species), and of the Amphibians (5 species). There is also a chapter (Vol. II, pp. 235-286) on 'The Extinct Vertebrate Animals of the Moray Firth Area,' by Dr. R. H. Traquair, illustrated by a number of text figures and nine plates. The work concludes with an 'Analysis of the Mammalian and Avian Fauna, to which are added Notes received since the Lists were printed off' (pp. 288-299). There is also a large colored map of the Moray Basin, and several bird's-eye sketches of the topography of the mountainous districts.

From the 'Analysis' we learn that of the 81 species of mammals found in Great Britain, 42 have been recorded from the Moray Basin area. Of 360-370 species of birds found in Great Britain, 255 are included in the present volumes, which in the 'Analysis' are divided into the various categories of 'residents', regular summer visitants, regular winter visitants, regular autumn and spring visitants, occasional visitants, etc. Of the total of 255 species, 26 are admittedly "recorded on insufficient evidence," but they are distinguished from the others by the entries being bracketed.

The work is evidently the result of much patient research, and the careful sifting of records, many of them MS. notes from more or less well-known local observers, not before published. The subjects have the appearance of being treated exhaustively, and the nature of the presence of many species, which are known to have varied much in abundance and in extent of range within the area in question, is given historically in detail. Thus some twenty-five pages are given to the Osprey, and six to a dozen to various other species.

¹ A Vertebrate Fauna of the Moray Basin. By J. A. Harvie-Brown, F. R. S. E., F. Z. S., etc., and T. E. Buckley, B. A., F. Z. S., etc. David Douglas, Edinburgh, 1895. Two Vols., sm. 4to. Vol. I, pp. i-xiv, 1-306; Vol. II, pp. 1-309. Map and numerous photogravure and other plates, one colored.

In view of the recent introduction of the Starling into this country, the following respecting this bird, which has of late greatly extended its range in the Moray Basin, may be of interest to American readers: "General favorite though he be, it is, in our opinion, a question whether his good qualities may not be found wanting in the balance of good and evil, a result following upon the force of his numbers and degree of assertiveness" (Vol. II, p. 4).

"A Fauna of the Moray Basin" is a model work of its kind, and a most valuable contribution to Scottish natural history.—J. A. A.

The 'Birds' of the Royal Natural History.—Since our previous notice of this work,¹ Parts 21–24 (March 1–April 15) have appeared, completing the portion relating to birds, which occupies pp. 289–576 of Vol. III and the whole of Vol. IV (pp. 1–576). Of Vol. IV there is yet to appear the title page, contents and index, which will be issued with Part 25, otherwise devoted to reptiles.

Chapter XII, 'The Diurnal Birds of Prey, or Accipitrines;—Order Accipitres,' occupies pp. 174–275 of Vol. IV, the one hundred pages devoted to this group sufficing to give a quite full and satisfactory account of these birds. Chapter XIII (pp. 276–288), treats of 'The Cormorant Group,—Order Steganopodes.' Chapter XIV (pp. 289–319) gives an account of the 'Herons, Storks, and Ibises,—Order Herodiones'; Chapter XV (pp. 320–362) is devoted to the 'Flamingoes, Ducks, and Screamers,—Orders Odontoglossi, Anseres, and Palamedeæ'; Chapter XVI (pp. 363–392), to 'The Pigeons and Sand-Grouse,—Order Columbæ'; Chapter XVII (pp. 393–450), to 'The Game-Birds and Rails,—Orders Gallinæ and Fulicariæ'; Chapter XVIII (pp. 451–469), to the 'Bustards, Thicknees and Cranes,—Order Alectorides'; Chapter XIX (pp. 470–518), to 'The Plovers, Sandpipers Jacanas, and Gulls,—Orders Limicolæ and Gaviæ'; Chapter XX (pp. 519–550), to 'The Tube-nosed Birds, Diving Birds, and Penguins,—Orders Tubinares, Pygopodes, and Impennes'; Chapter XXI (pp. 551–576), to 'The Tinamus, Flightless Birds, etc.—Groups Crypturi, Stereornithes, Ratitæ, Odontornithes, Saururæ,' concluding the work. Chapter XII is by Dr. R. Bowdler Sharpe and Chapters XVI and XVII are by W. R. Ogilvie Grant; the authorship of the other chapters here under notice is not as yet disclosed, but is apparently by the editor, Dr. Lydekker.

The commendation bestowed upon the earlier bird parts of this great work is equally well-merited by these concluding numbers, which give in small compass a vast amount of information on the groups treated. The illustrations are excellent and abundant, although only in small part new, yet none the less appropriate and instructive. The relationships and distinctive characteristics of the higher group are briefly considered,

¹ See Auk, XIII, 1896, pp. 156–160.

and the various extinct types are also mentioned. As a popular treatise on the Class Aves, the work as a whole is entitled to generous patronage.—J. A. A.

Publications Received.—Allen, J. A. 'Progress in American Ornithology. 1888-1895.' (Science, May 22, and June 5, 1896.)

Bruner, Lawrence. Some notes on Nebraska Birds. A list of the Species and Subspecies found in the State, with notes on their distribution, Food-habits, etc. (Rep. Nebraska State Hort. Soc., 1896, pp. 48-178.)

Büttikofer, J. On *Phasianus ignitus* and its nearest Allies. (Notes from the Leyden Museum, XVII, pp. 169-196.)

Dury, Charles. Note on the Chachalaca, *Ortalis vetula mcalli* Baird. (Journ. Cincinnati Soc. Nat. Hist. XVIII, pp. 201-202.)

Hartert, Ernst. Preliminary Descriptions of some new Birds from the Mountains of Southern Celebes. (Nov. Zool. III, pp. 69-71, 1896.)

Harvie-Brown, J. A. The Tufted Duck in Scotland: its Increase and Distribution. (Proc. Roy. Phys. Soc. Edinburgh, XIII, pp. 144-160.)

Harvie-Brown, J. A., and T. E. Buckley. A Vertebrate Fauna of the Moray Basin. 2 Vols., small 4to. Edinburgh. David Douglas, 1895. Price, 42 shillings net.

Howe, Reginald Heber, Jr., "Every Bird"—A Guide to the identification of the Birds of Woodland, Beach and Ocean. Sm. 8vo, pp. viii, 192. Boston: Bradley Whidden, 1896.

Lydekker, Richard (editor). Warne's Royal Natural History, Nos. 21-24, Feb. 15-April 15, 1896. Birds. Super Royal 8vo. Frederick Warne & Co., 3 Cooper Union, New York. Published in fortnightly parts, 50 cents each.

Miller, Olive Thorne. Four-handed Folk. 16mo. Houghton, Mifflin & Co., Boston, and New York. \$1.25.

Montgomery, Thomas H., Jr. Extensive Migration in Birds as a Check upon the Production of Geographical Varieties. (Am. Nat., June, 1896, pp. 458-464.)

Noska, Max, and Victor Ritter von Tschusi zu Schmidhoffen. Das kaukasische Königshuhn, *Tetraogallus caucasicus* (Pall.). Eine monographische Studie. (Orn. Jahrb., VII, 1896.)

Richmond, Charles W. Description of a New Species of Plover from the East Coast of Madagascar. (Proc. Biol. Soc. Washington, X, pp. 53, 54.)

Ridgway, Robert. (1) Description of a New Species of Ground Warbler from Eastern Mexico, (Proc. U. S. Nat. Mus. XVIII, No. 1045, pp. 119, 120.) (2) Preliminary Descriptions of some New Birds from the Galapagos Archipelago. (*Ibid.*, No. 1067.) (3) Description of a New Subspecies of the Genus *Peucedramus* Coues. (*Ibid.*, No. 1074.)

Rothschild, Walter, and Ernst Hartert. Contributions to the Ornithology of the Papuan Islands. (Nov. Zool., III, pp. 8-20, pl. i, March, 1896.)

Salvadori, Tommaso. Uccelli della Nuova Guinea meridionale-orientale. (Ann. del Mus. Civ. di Stor. Nat. di Genova, Ser. 2, XVI, pp. 55-120.)

Saunders, Howard, and Osbert Salvin. Catalogue of the Gaviæ and Tubinares in the British Museum. 8vo, pp. xv, 475, pll. 8.

Short, Ernest H. Birds of Western New York, with Notes. Second Edition. 1896. 8vo, pp. 20. Frank H. Lattin, Publisher, Albion, N. Y.

Shufeldt, R. W. Progress in American Ornithology, 1886-1895. (Am. Nat., May, 1896, pp. 357-372, and Science, June 5, 1896.)

Stone, Witmer. The Molting of Birds with special reference to the Plumages of the smaller Land Birds of Eastern North America. (Proc. Acad. Nat. Sci. Philadelphia, 1896, pp. 108-167, pll. iv, v.)

Witchell, Charles A. The Evolution of Bird-Song, with observations on the influence of Heredity and Imitation. London: Adam and Charles Black. New York: Macmillan & Co. 1896. 8vo, pp. x, 253. Price, \$1.75.

American Journ. Sci. April-June, 1896.

American Naturalist. April-June, 1896.

Annals of Scottish Nat. Hist., April, 1896.

Bulletin British Ornithologists' Club, Nos. 33-36, 1896.

Canadian Record of Science, VI, Nos. 3-8, 1894-96.

Forest and Stream, XLVI, Nos. 14-26, 1896.

Iowa Ornithologist, II, Nos. 2, 3, 1896.

Medical Age, XIV, Nos. 5-10, 1896.

Memoirs of the California Acad. Sci., II, No. 2, Feb. 1896.

Naturalist, The, Month. Journ. Nat. Hist. for North of England, April-June, 1896.

Nidiologist, The, III, Nos. 8, 9, 1896.

Observer, The, VII, April-June, 1896.

Oregon Naturalist, The, II, Nos. 3-5, 1896.

Ornithologische Jahrbuch, VII, No. 2, 3, 1896.

Ornithologische Monatsberichte, IV, Nos. 4-6, 1896.

Ottawa Naturalist, The, X, 1-3, 1896.

Our Animal Friends, XXIII, Nos. 8-10, 1896.

Proceedings Acad. Nat. Sci. Philadelphia, 1896, pt. 1, Jan.-March.

Proceedings California Acad. Sci., V, pt. 2, 1896.

Records of the Australian Museum, II, No. 7, Jan., 1896.

Report Park Commissioners, Springfield, Mass.

Science, New Ser., III, Nos. 53-76, 1896.

Shooting and Fishing, XIX, Nos. 21-26; XX, Nos. 1-8, 1896.

Zoölogist, The, Nos. 232-234, 1896.

GENERAL NOTES.

Name of the Large-billed Puffin.—The A. O. U. Committee (Check-List N. A. Birds, No. 13 *a*) seems to have been misled in quoting Temminck in connection with this bird, and also in citing Stephens, 1826, for the original description. The bird appears to have been first named, by Naumann, Isis, 1821, p. 782, pl. 7, fig. 2, credited to Leach. Stephens's Continuation of Shaw's Gen. Zool., as quoted of 1826, XIII, p. 40, I have not verified, but believe the correct citation to be 1825, XIII, p. 40, pl. 4, fig. 2.—ELLIOTT COUES, *Washington, D. C.*

[*Cf.* Auk, XIII, p. 189, April, 1896.—EDD.]

Record of a Fourth Specimen of the European Widgeon (*Anas penelope*) in Indiana.—A fine adult male of this Duck was killed on the marshes of the English Lake Shooting and Fishing Club at English Lake, Indiana, by Mr. John E. Earle of Hinsdale, Ill., on the 23d of March, 1896. It was flying in company with a small flock of Baldpates when shot. Mr. Earle has had it mounted and it is now in his possession. This specimen makes the eighth record for the interior, including the one cited by Mr. Frank S. Wright of Auburn, N. Y., in the 'Ornithologist and Oölogist,' Vol. VII, p. 133, as taken on Lake Cayuga, N. Y., in May, 1880. This record I had previously overlooked. In a recent letter from Mr. Wright he informs me that he still has this Duck in his possession.—RUTHVEN DEANE, *Chicago Ill.*

Recent Occurrence of the Florida Gallinule in Southern Maine.—Two immature male specimens of the Florida Gallinule (*Gallinula galeata*) have recently been taken on the 'Dyke' marsh in Falmouth, near Portland. The first was shot on September 20, 1894, and is preserved in the collection of Mr. W. H. Rich, of Portland. The second was shot on September 30 of the same year, and is in my own collection. Both of these birds were seen by me before they were preserved.—HENRY H. BROCK, *Portland, Me.*

Baird's Sandpiper in Michigan.—In 'The Auk' for April (Vol. XIII, p. 174) I find mention made of the taking of *Tringa bairdii*, Baird's Sandpiper, at Grand Rapids, Michigan, the writer stating that it was the second or third, or perhaps the first ever taken in the State. During the past few months a number of letters have reached me, making inquiries in regard to this bird, to which I wish to make the following reply through 'The Auk.'

In 'Birds of Michigan' by A. J. Cook (second edition), page 59, I find the following: "*Tringa bairdii*. Baird's Sandpiper. This species is embraced in Covert's 'Birds of Michigan.'"

Where the *author, editor, or compiler* got authority for the above statement is to me a question. In 1876 I published a list of Michigan birds; it is not included in this list. In 1878 I prepared a MSS. list; it is not in this list. In 1881 I published my last list, and it is not in this. Will some one tell me where the aforesaid author found his authority for the above statement? Now the fact is, I did kill *Tringa bairdii*, in Michigan, on Aug. 15, 1893,—a male bird, at 'The Over-flow,' four miles east of Ann Arbor, which specimen was presented to Michigan University Museum, and can be seen there at any time.—ADOLPHE B. COVERT, *Ann Arbor, Mich.*

The Belted Piping Plover in Massachusetts.—During a trip to Marshfield, Mass., on April 20, 1896, I started two small Plovers from a sandy beach. They were very wild and difficult to approach but after several attempts I managed to secure one of them.

The bird proved to be a male Belted Piping Plover (*Egialitis meloda circumcincta*), the band across the breast being very dark and well marked. This is the first time I have met with this bird in the spring, although it occasionally occurs during the fall migration.—FOSTER H. BRACKETT, *Boston, Mass.*

Discovery of the Eggs of the Belted Piping Plover.—As I am not aware that the nest and eggs of this species (*Egialitis meloda circumcincta*) have been previously recorded, perhaps the following notes will be of interest to oölogists.

Mr. Oliver Spanner of Toronto after reading 'Bird Nesting in North West Canada' decided to make a trip to Lake Manitoba and while there secured eggs of this species. On June 19, 1895, he found a nest on Birch Island near the west shore of Lake Manitoba. The nest consisted of a depression in the sand lined with bits of drift weed, and contained three eggs which are similar to those of the common Piping Plover; the ground color is pale buff and they are finely spotted with black and purple gray, averaging in size 1.25×1.00 . Both eggs and skin of the parent are now in my collection. Mr. Spanner also obtained young birds in the down at the same time, and as he saw several pairs of these Plovers, together with solitary Sandpipers, no doubt these were nesting in the vicinity.—W. RAINE, *Toronto, Canada.*

Recent Capture of the Golden Eagle near Portland, Maine.—The Golden Eagle (*Aquila chrysaëtos*) is so rare in the neighborhood of Portland that a recent capture should be recorded. I have an adult male specimen, sent to me in flesh, which was shot at Duck Pond, Windham, October 14, 1891.—HENRY H. BROCK, *Portland, Me.*

Golden Eagles in Virginia.—Mr. David N. McCadden, taxidermist at the Philadelphia Academy of Natural Sciences, received three Golden Eagles

from Looney, Craig Co., Va., December 18, 1895, two of which were shipped alive. Mr. J. B. Ruble, who secured the birds, writes the following particulars concerning their capture: "Mr. John Myers, who lives near the top of the mountain here, saw the Eagles feeding on a dead sheep; he set a trap and caught four of them from the one sheep. There are more Eagles in this county than I ever saw before. Mr. John Looney told me that about a week ago he saw thirteen in one flock, and there have been eight or ten in all taken in Craig County this winter." In answer to further inquiry Mr. Ruble writes that he considers that all the Eagles were of the same kind. Gentlemen who have been going down to Craig County for deer, for a number of years past, say that they never heard of any Golden Eagles there before, and Dr. Rives, in his 'Birds of the Virginias,' only gives a few records for this species. The occurrence of the bird in such numbers therefore seems to be well worth recording.—WITMER STONE, *Acad. Nat. Sci., Philadelphia, Pa.*

Nidification of the Dusky Horned Owl.—According to the few records of the eggs of *Bubo virginianus saturatus* in Bendire's 'Life Histories of North American Birds,' it appears that the eggs of this species are very rare and that none have been obtained for many years. Capt. Bendire records a set of two eggs that were taken by Kennicott in Alaska, April 16, 1862, and also another egg taken by H. Connelly in Labrador in 1863.

I therefore have pleasure in recording a set of two eggs that were taken recently. Although I have once or twice received eggs from the North supposed to belong to this species, it was not until last season that I was able to obtain the parent with the eggs. The nest was found by my collector at Sandwich Bay, Labrador, April 17, 1895, and the label says: "The nest was built in a spruce 15 feet from the ground, and made of twigs and coarse grass." The female was shot as she left the nest and is an exceptionally dark specimen. Both eggs with the parent are now in the collection of R. S. Sharples, Esq., of Elgin, Ill.—W. RAINE, *Toronto, Canada.*

Four Winter Records of the Short-eared Owl on the Massachusetts Coast.—I have a female Short-eared Owl (*Asio accipitrinus*) in my collection which was taken at Orleans, near Chatham, Mass., on February 23, 1896, by Mr. Charles J. Paine, Jr.; and I also know of a female (?) taken at Ipswich, Mass., on December 31, 1895, by Mr. Ralph W. Gray; and a male taken at the same locality by Mr. George C. Shattuck on January 1, 1896; also a female taken at the same locality on February 12, 1896, by Mr. W. S. Townsend.

I also know of a number of specimens taken at Middletown, near Newport, R. I., in winter.—REGINALD HEBER HOWE, JR., *Longwood, Mass.*

The Roadrunner as a Rat-killer.—This forenoon (May 7, 1896), I came suddenly upon a Roadrunner (*Geococcyx californianus*) that had just

finished despatching a woodrat (*Neotoma*). The bird reluctantly withdrew as I came upon the scene, leaving the rat, which I found to be quite dead. A post-mortem disclosed a bad contusion on the side directly over the heart, and another on the spine between the shoulders, while the skull was crushed by a blow behind the ear, although the skin was nowhere broken.—A. W. ANTHONY, *San Diego, Cal.*

The Redheaded Woodpecker in Eastern Massachusetts.—It is so seldom that a Red-headed Woodpecker (*Melanerpes erythrocephalus*) is seen in eastern Massachusetts that its occurrence is worthy of note. On Sunday noon, March 8, 1896, while taking a walk through a grove of mixed elm, maple and pine trees in the section of Boston known as Dorchester, I came across a beautiful bird of this species, lazily climbing about on a partially decayed stump and apparently searching for food. The bird was very tame, allowing me to follow it closely as it flew from tree to tree and to approach to within ten or fifteen yards on several occasions. After watching it for some fifteen minutes and thinking from its tameness and from its partiality to a particular stump that it might be wintering in the locality I quietly withdrew. A thorough search of the woods the next morning failed to discover the bird again and I concluded it was probably a temporary visitor.

On May 8, 1896, while walking early in the morning in Dorchester District, my attention was attracted by the loud calling of a Red-headed Woodpecker. After a short search the bird was located in a clump of tall oak trees and was shot. It proved to be a male in full plumage, and was very fat. This is probably the same bird noticed by me on March 8, 1896, as recorded above, as it was shot within one hundred yards of where it was previously observed.

I have seen this species in Massachusetts only once before, the first time being on May 19, 1878.—FOSTER H. BRACKETT, *Boston, Mass.*

Pyrocephalus rubineus mexicanus in Los Angeles County, Cal.—During recent winters numerous duck-hunters in the San Gabriel River bottom have observed a "fiery red" bird among the willow trees. On Dec. 8, 1895, I secured an adult male which, as I expected, proved to be the Vermillion Flycatcher. On Feb. 8, 1896, I again shot a specimen, an adult female in the same locality. Thus it appears that *Pyrocephalus rubineus mexicanus* is a regular winter visitant to the river bottoms in Southern California west of the Sierra Madre Mountains.—HORACE A. GAYLORD, *Pasadena, Cal.*

Intergradation in Song of *Sturnella magna* and *S. m. neglecta* in Missouri.—In Dr. Coues's 'The Birds of the Northwest,' Mr. Tripp notes that he had never observed any intergrading of the songs of *Sturnella magna* and *S. m. neglecta*. Some seven or eight years ago while creeping on some ducks in Audrain County, Mo., I heard a very pecu-

liar lark song, but was unable to investigate the matter. Later I wrote Mr. Vernon Bailey and Mr. B. H. Dutcher, both of whom had been observing the intergradations of plumage and habits in Kansas of these two birds, and I asked of them if they had observed any birds with a blended voice. Neither had; and Mr. Bailey was kind enough to ask other ornithologists at the Smithsonian Institution concerning the matter. None had noticed any intergrading.

But recently (March 9, 1896) I was in the same region of my former duck hunt and heard distinctly a Western Lark's song. It was fairly typical but too highly pitched. A mile away I heard another that was deeply liquid and gurgling—in fact quite typical of *S. m. neglecta*, but only a fourth of a mile away I heard one whose song was that of *S. magna* except that it had near the middle a rather highly pitched gurgle. It did not have, in its many repetitions, any downward ending as the other two birds had. Neither was the entire song so highly pitched as that of the typical *S. magna*—scores of which were singing around it.

To my mind here was a distinct intergradation—perhaps the result of hybridism. The region was in Audrain County, Mo., about fifteen miles southwest of Mexico, Mo., and about one fourth of a mile north of the divide between the water-sheds of the Missouri and Mississippi Rivers.

I had shot the *S. m. neglecta* once before in this county further eastward.

This is the only region near me where *S. m. neglecta* is found so far as I know, though it comes into Southwest Missouri. I might add that I am well acquainted with the song of *S. m. neglecta*, having heard it in Kansas, Colorado and S. Dakota.—JAMES NEWTON BASKETT, *Mexico, Mo.*

Pinicola enucleator at Worcester, Mass.—A flock of sixteen Pine Grosbeaks, containing a few bright males, was reported in the northern part of this city Jan. 15, 1896. For a little over a month the Grosbeaks were seen in different parts of the city, one or two or a half dozen at a time, feeding upon mountain-ash berries and seeds of maple and Scotch elm. The last seen was on Feb. 21. But few bright males were seen, the largest number being reported on Feb. 19, when a flock of fifteen contained "several brilliant specimens."—HELEN A. BALL, *Worcester, Mass.*

Evening Grosbeak in Southern Wisconsin.—On January 21, 1896, while passing an old, deserted cemetery on the outskirts of Delavan (Wis.), I heard lively chattering among the large 'evergreen' trees within the graveyard and knew at once that it was the note of some bird new to me. On watching closely I soon saw a beautiful male Grosbeak (*Coccothraustes vespertinus*) appear on the outside of the tree, and later a couple more and two or three of the plainer clothed females. There

must have been at least a dozen in the tree. They were seen every day in good numbers up to about the middle of March, and throughout the remaining part of the winter a small flock of ten or a dozen were constant residents of the immediate vicinity of the above mentioned cemetery. This flock was last seen on March 30. It is their first occurrence in this locality to my knowledge, and I find no one who ever remembers seeing the bird here before. Pine Grosbeaks (*Pinicola enucleator*) were also observed in the county during December last.—N. HOLLISTER, *Delavan, Wisc.*

Zonotrichia albicollis and Mniotilta varia at Pasadena, Cal.—On Nov. 21, 1894, while collecting sparrows in a large blackberry patch just inside the western limits of Pasadena I shot an immature female White-throated Sparrow from a flock of *Z. coronata*, thus adding another record for this species from California.

Early in the morning of Oct. 8, 1895, I shot an immature female Black-and-white Warbler in the Arroyo Seco just west of Pasadena. The bird was at the time alone, and apparently as much at home in Southern California as she would have been east of the Rocky Mountains. So far as I can ascertain this is the second record of this species from California.—HORACE A. GAYLORD, *Pasadena, Cal.*

The Wintering of the Towhee at Longwood, Massachusetts.—I am glad to be able to report the following information in regard to the Towhee (*Pipilo erythrophthalmus*) noted December 25, 1895, at Longwood (see Auk, Vol. XIII, p. 178).

Mr. Henry Vose Greenough, who saw the Towhee with me on Christmas Day, reported to me having seen on March 23, 1896, a male Towhee about a brush pile, some one hundred and fifty yards from the spot where we had noted the one in December. On March 24 I went with him to this place and in a neighboring hemlock hedge we found Pipilo.

The brush pile is on the edge of an estate, only a few hundred feet from a stable, pig-sty and hen yard, where food and protection from the winter weather were easily accessible. When we started the Towhee on the 24th he flew straight for the hen yard and then being pursued, to another hemlock hedge leading us in a circuit back to the brush pile.

I believe there can be little doubt that this is our Christmas Towhee, which had wintered here, for the following reasons, viz.: Protection and food supply at hand; a male bird, as was the former one; in practically the same locality, and because it is exceedingly unlikely that a single bird would migrate northward fully a month in advance of its fellows.

We have not noted this bird during January and February, though we both have covered the neighboring ground almost daily, because the place is just on the edge of this little patch of woodland and the Towhee evidently never wandered far from his brush pile and the farm yard.

Since the 23d and 24th of March we have noted the Towhee on the following dates,— March 25, 28, April 2, 4, 7, 9 (singing), 10, 12, 13 and 16, when he disappeared.

The occurrence of this Towhee here makes a valid record of the wintering of this species in Massachusetts, and the female that was taken at Bedford, Mass., on January 2, 1896, and the specimen taken at Portland, Conn., would seem to show that this bird can stand the rigors of a New England winter, and that we may look for further records of the wintering of this species in the future.—REGINALD HEBER HOWE, JR., *Longwood, Mass.*

The Nonpareil at Longwood, Massachusetts.—On June 5, 1896, Henry V. Greenough brought me a male Painted Finch (*Passerina ciris*) which he had shot at about 8 A. M. The bird was in perfect plumage, its wings and tail showing apparently no cage wear and its feet in perfect condition.

I examined its stomach which contained white gravel, suggesting cage gravel (although the bird had been seen upon a gravel walk where I found the same kind of gravel), a white worm, a small amount of dark gravel and a few seeds (not canary seed), and the bird was also quite fat. Its testes were very much enlarged.

The bird uttered only a few notes on alighting and when started, like *chit-chit*. He was seen the day before, and although fairly tame at first, became quite wild from being watched.

The probability of course is strongly in favor of this being an escaped cage bird, but at the same time, the weather having been fair and warm for a week, this bird might have strayed from southern climes.—REGINALD HEBER HOWE, JR., *Longwood, Mass.*

Peculiar Traits of Some Scarlet Tanagers.—Scarlet Tanagers (*Piranga erythromelas*) are not common in this vicinity (Ridgewood, N. J.); for many years I saw only two or three during spring migrations. Within the last few years a few pairs have bred in this locality, generally on the outskirts of woods; so I was surprised to see a pair nesting in a Norway spruce, on a branch only about ten feet from the corner of my house, and about the same distance from the ground. In all my ornithological experience I never knew a pair of birds to live and nest so near my house with such secretiveness.

One of my family first saw the birds from an upper window that looked down on the nest. The nest building appeared to be all done by the female. The male bird was seen usually in the morning, apparently inspecting the work or noting its progress, but was seldom seen during the rest of the day. Both birds when approaching their nest alighted near the top of this high tree and descended through the branches to the nest, which was flat, very evenly built, like a cup of basket work, beautifully woven of material resembling the color of the bark of the

tree. Taken with the greenish color of the female, it was a remarkable instance of color illusion; every time I wanted to see the nest, knowing the branch it was on, I had to run my eye along the branch till it met the nest before I could see it; the shallow nest and the greenish female were remarkably inconspicuous. Only the female took part in the duties of incubation. She would remain on the nest even when one passed closely, but if anyone stopped to look at her, she would glide off the nest through the tree in the opposite direction, so quietly as to almost make one doubtful of her presence. The birds became quite accustomed to seeing one of my family sitting at the window close by. I did not go very near the nest for fear of disturbing the birds.

When the young were hatched another peculiarity was noticed, these birds differing much from most birds in the manner of feeding their young. I watched several evenings for an hour or more at a distance from the tree, but could clearly see the nest with my field glass. Still I did not once see the female feed her young. Most birds feed their young often just before sunset, and I think the female Tanager must have known she was watched, for one evening I watched as long as I could see the nest and no mother appeared. I thought some harm must have happened to her, but next morning she was at home. My business did not allow me to watch them much during the day; one afternoon the bright male Tanager put in an appearance in the upper part of the tree, but seeing me he made off without coming near the nest.

Soon the downy backs of the nestlings showed above the rim of the basket house, when the hen seldom brooded them unless it was wet weather. These youngsters were perfectly quiet, never clamoring for food, like so many other nestlings. Before they were big enough to project conspicuously above their flat nest they left it and went higher up the tree. This was on the 3d of July. Their color being greenish, it was very hard to distinguish them in the upper branches where they were secreted and fed by the parents.

A few days before leaving the nest a violent tempest passed over the vicinity; trees were thrown down and scattered over the ground in all directions; many nests of different birds were tossed or knocked out of the trees by wind or hailstones. I thought it impossible for my Tanagers to escape harm, but they were all right after the storm, which showed how the faithful mother must have covered them. The young birds and mother remained about for several weeks, but the male was absent, if his scarlet was still worn.

I took down the deserted nest. It was composed of long fine brown rootlets, fine thin stems of running blackberry, with a little grass and string evenly woven; it was thinly lined with a fine yellowish brown, thread-like fibre, as fine as horsehair. The whole structure can be seen through yet it is strong.

Had I expressed an opinion on the habits of the Scarlet Tanager from that year's observation I should have said the male bird was very shy,

giving as a reason that his conspicuous dress was a target for his enemies; which is the usual way we try to make other people think we know something. So I will now describe the following year's events, which was 1895. A female Scarlet Tanager came and built exactly on the same spot where the previous year's nest was; hence I infer it was the same female. But what of her gay lord, was he the same male? If so he must have undergone a great change of character, for he showed himself about the tree frequently and sang on the next tree very often during the day. But the most remarkable thing of all was, he spied a nest of Chippy Sparrows (*Spizella socialis*) with young ones. To my surprise he kept going to the nest and fed the baby Chippys, much to the disgust of their parents, who kept hovering around with food in their mouths which the little things could not take, after being fed so often by their gorgeous foster father. This was continued for a number of days. When his own precious young burst their shells and required attention he then left the Chippys to their rightful parents, which were now outgrowing their narrow domicile, being duly cared for. Mr. Tanager now paid as faithful attention to his own family, feeding them very frequently and singing his sweet song between feeding and collecting food. Seldom was he away, near sunset, longer than ten or fifteen minutes. So I am at a loss to account for the shyness shown the previous year, unless this was a second husband of the same female Tanager; and then the extraordinary fact of his feeding other birds' young ones is one of the exceptions that make the study of birds a pleasant recreation.—HENRY HALES, *Ridgewood, N. Y.*

The Occurrence in Nebraska of *Vireo flavoviridis*.—A specimen of the Yellow-green Vireo, *Vireo flavoviridis*, shot at Long Pine, Brown County, has just been received by the Curator of the Museum of the University of Nebraska. This is the first one reported in this State. It is a rare Vireo for the entire United States having been reported, as far as the author can learn, from Texas, California, and Canada only.

The specimen was shot and donated by the Rev. J. M. Bates of Long Pine, who has already done a great deal to further the knowledge of our native birds.

This adds one more to Prof. Lawrence Bruner's List of Nebraska Birds, recently published by the Nebraska State Horticultural Society. The total number of species and sub-species for the State is now 418.—ERWIN H. BARBOUR, *University of Nebraska, Lincoln, Nebr.*

***Helminthophila rubricapilla* vs. *Helminthophila ruficapilla*.**—The A. O. U. Committee appear to have ignored their rule "Once a synonym always a synonym," in the case of the Nashville Warbler. The West Indian *Dendroica ruficapilla* was called *Sylvia ruficapilla* by Latham in 1790 (Ind. Orn., II, 540). Wilson applied the same name to the Nashville Warbler in 1811 (Amer. Orn., III, 120). Whether by design or by

inadvertence, the name was altered to *S. rubricapilla* in a later volume of Wilson (Amer. Orn., VI, 1812, 15) and this appears to be the earliest eligible name for the Nashville Warbler. Under the A. O. U. Code. Nos. 645 and 645a of the 'Check-List' should therefore stand as *Helminthophila rubricapilla* (Wils.) and *Helminthophila rubricapilla gutturalis* (Ridgw.).—WALTER FAXON, *Museum of Comparative Zoölogy, Cambridge, Mass.*

Bachman's Warbler (*Helminthophila bachmani*) in **Greene County, Arkansas**.—Very early on the morning of May 7, 1896, while in the company of Mr. O. C. Poling, I heard among the score of voices a song which was new to me. It suggested a relationship to *Helminthophila pinus*, but it had several more notes to it. Neither was it a Parula song. After a little search we found the singer, a small yellow bird with conspicuous black throat and black crown, perched twelve feet above dry ground on the lower branch of a medium-sized tree surrounded by a heavy growth of blackberry and other bushes. It did not take me long to identify the bird, nor did it take Mr. Poling long to secure it.

Two days afterwards, May 9, we found and secured in the same manner a second male, only a few rods from where we took the first, but circumstances, among them, two very dead hogs, prevented a thorough search for the nests and females in the vicinity. The highly developed testes showed that they were breeding. The black of the throat extends from the chin to the breast. The locality is in the region of the peninsula of Missouri, on Boland Island, on the Arkansas side of the St. Francis River, and therefore in Greene County, Arkansas.—O. WIDMANN, *Old Orchard, Mo.*

Second Occurrence of the Blue-Gray Gnatcatcher in Maine.—On the morning of April 18, 1896, while driving past a farm-yard on Cape Elizabeth, about three miles from Portland, I heard the nasal call-note of a Blue-gray Gnatcatcher (*Polioptila cærulea*). In another moment I saw the bird fly from an old oak to an orchard close at hand. Here I watched him at my leisure. He was very active, but not at all shy, coming several times within eight or ten feet of me, constantly calling, often singing, and repeatedly, of course, displaying his characteristic form and colors. There was no bird of any kind with him. An hour later, I drove past the farm-yard again, and found him still in the neighborhood, having simply crossed the highway. He was still entirely alone. I drove within a few feet of him, and watched him for several minutes,—until he again flew off into the orchard.

The weather throughout New England was almost summer-like for a week preceding April 18, and to this fact, perhaps, was due the bird's long journey from the usual haunts of his kind.

The Blue-gray Gnatcatcher has not been seen in Maine before in spring, and has been positively identified in the State but once before.¹—
NATHAN CLIFFORD BROWN, *Portland, Me.*

Southern California Bird Notes.—The following notes on birds observed in the vicinity of San Bernardino, Cal., have been kindly furnished me by my friend Mr. R. B. Herron of Ferndale, Cal.

Callipepla californica vallicola + **C. gambeli deserticola** *Stephens.*—Mr. Herron has recently received a fine pair (♂ and ♀) of hybrids between the above two species. They were shot near Hesperia, Cal., about Dec. 20, 1895, out of a flock of seven or eight, presumably the same brood. Mr. Herron some time since took a pair of hybrids in the Colorado Desert which were described by Mr. Henshaw in the Nuttall Bulletin; he also shot a mated pair at Palm Springs, Cal., in the Colorado Desert, of which the male was *deserticola* and the female *vallicola*; these were nesting. The following is a description of the male hybrid: Crown brown as in *deserticola*; neck-feathers with heavy shaft-lines as in *vallicola* but no white dotting; fore part of breast with faint shaft-lines like *deserticola*; pectoral spot very light buff—lighter than in *vallicola*—with faint scalings. Spot on belly small and light brown, feathers with heavy scalings. Sides and flanks as in *deserticola*.

Syrnium occidentale.—My friend, Mr. E. F. Lane of Azusa, Cal., took a fine female in Little Tejunga Cañon, Cal., in June, 1888. Mr. Herron shot a pair near Banning, Cal., in September, 1895. No less than five specimens were taken in 1894 and 1895 in the cañons back of Pasadena, Cal.

Icterus parisorum.—Mr. Herron shot a fine male in Reche Cañon, six miles from San Bernardino, Cal., April 1, 1895.

Pipilo chlorurus.—A number of these birds wintered in the low lands along the Santa Ana River near San Bernardino; specimens were taken in January and February by Mr. H. E. Wilder.

Phainopepla nitens.—A small flock of these birds also passed the winter in the Santa Ana River bottom.—E. C. THURBER, *Alhambra, Cal.*

Merrem's Work.—This is a rare book, which can hardly if at all be found in this country; it is usually quoted at second hand, as in the instance of *Passerella iliaca*, in the new A. O. U. Check-List, where the title is given in German, with the date "1786-87." I handled the Latin edition in London in 1884. The full title and collation are as follows:

1786. MERREM, B.—Avium | rariorum et minus cognitarum | Icones et Descriptiones | collectae | et e Germanicis Latinae factae | a Blasio Merrem, | Ph. D. Phys. et Math. in Reg. Dvisburgensi Acad. P. P. O. | Soc. R. Scient. Gotting. Litterar. Comm. inuncto. | — | Fasciculus

¹ See Bulletin Nutt. Orn. Club, V, pp. 236-37.

Primvs [Secvndvs]. | — | Lipsiae, | ex bibliopolio Io. Godofr. Mülleri-
ano CIO DCCCLXXXVI. 1 vol. folio. Title 1 l.; dedication backed by
preface, 1 l., pp. 1-20, 1 l. (title of Fasc. II), 21-45, pll. col'd 1-vi, vii-xii.

The work treats extensively of the following birds: *Cotinga rubra*,
p. 1, pl. 1, fig. 1. *C. cuprea*, p. 5, pl. 1, f. 2. *Gracula nobilis*, p. 7, pl. 2.
G. chrysoptera, p. 10, pl. 3. *Mellisuga coccinea*, p. 14, pl. 4. *Merops*
spiza, p. 16, pl. 5. *Muscicapa ferruginea*, p. 19, pl. 6. *Aquila glaucopsis*,
p. 21, pl. 7. *Lanius atricapillus*, p. 26, pl. 8.—TROGONUM genus, mono-
graph of, in Linnæan style, pp. 28-36, treating of: *Trogon hæmorrhoida-*
lis, *T. curucui*, p. 33 (pl. 9); *T. strigilatus*, *T. ferrugineus*, p. 34; *T.*
flammeus, *T. viridis*, p. 35.—*Fringilla iliaca*, p. 37, pl. 10. *Penelope iacu-*
pema, p. 39, pl. 11. *P. leucolophos*, p. 43, pl. 12.

The work consists of two fasciculi, separately full-titled and probably
issued apart; and the title of Fascicvlvs Secvndvs is literally different
from that of Fascicvlvs Primvs. But both bear the same date, 1786, and
are bound as one volume in the copy examined in the library of the
Zoölogical Society. The pagination and numeration of the plates are con-
tinuous; so that it is not necessary to cite the work by fasciculi. The
first 20 pages and 6 plates belong in Fasc. I., the rest in Fasc. II.—ELLIOTT
COUES, *Washington, D. C.*

Mandt's Inaugural Dissertation.—This is a scarce tract, which I have
never seen cited in full, and which is seldom so cited as to give any satis-
factory idea of what it may be. The following is the title:

Observations in Histo- | riam Naturalem et Ana- | tomiam comparatam
in | itinere Groenlandico | factae. | — | Dissertatio | In auguralis | quam
| consensu et auctoritate | gratiosi medicorum ordinis | in | Universitate
Literaria Berolinensi | ut | summi in medicina et chirurgia | honores rite
sibi concedantur | die XXII. M. Iulii A. MDCCCXXII | H. L. Q. S. |
publice defendet | auctor | Martinus Guilelmus Mandt | Beyenburgensis |
— | [etc., 4 lines.] | — | Formis Brueschckianis. 1 vol., sm. 8vo., 4 prel. ll.,
pp. 1-40.

A list of birds occupies pp. 3, 4; and on p. 30 is described *Uria mandtii*,
Licht., sp. n.—ELLIOTT COUES, *Washington, D. C.*

Correction.—In the Auk, Vol. XIII, No. 2, for April, page 176, under
'Abnormal Plumage in a Pine Grosbeak,' "its width having decreased .20
of an inch" should read "its width having decreased to .20 of an inch."
On page 178, the paragraph on the Winter Wren, under 'Three Winter
Notes from Longwood, Massachusetts,' "and on the 25th shot, I think,
the same bird" should read "and on the 25th of December shot, I think
the same bird."—REGINALD HEBER HOWE, JR., *Longwood, Mass.*

NOTES AND NEWS.

THE TEXT relating to Plate III, in the present number of 'The Auk,' will be found in the January number of this volume (XIII, pp. 25, 26).

DR. JUAN GUNDLACH, an Honorary Member of the American Ornithologists' Union, died in Havana, Cuba, March 14, 1896, at the age of 85 years. Dr. Gundlach was born at Marburg, Germany, in 1811, where he was educated, and in 1839 went to Cuba, where he resided during the remainder of his life. For nearly fifty years he was a recognized authority on the ornithology of Cuba. Some of his earlier papers appeared in the *Boston Journal of Natural History* (1857) and the *Annals of the Lyceum of Natural History of New York* (1858), in which he described various new species of Cuban birds. His principal contributions to Cuban ornithology, entitled 'Beiträge zur Ornithologie Cubas,' and 'Neue Beiträge zur Ornithologie Cubas, nach eignen 30 jährigen Beobachtungen zusammengestellt,' were published in the 'Journal für Ornithologie' (the first, 1854, pp. lxxvii-lxxxvii, 1855, pp. 465-480, 1856, pp. 1-16, 97-112, 337-352, 417-432, 1857, pp. 225-242 [see also, 1859, pp. 294-299, 347-351]; and the second, 1871, pp. 265-295, 353-378, 1872, pp. 401-432, 1874, pp. 113-166, 286-303, 1875, pp. 293-340, 353-407). He also published 'Beitrag zur Ornithologie der Insel Portorico', in the same journal (1874, pp. 304-315), and 'Neue Beiträge zur Ornithologie der Insel Portorico' (1878, pp. 157-194). He also published in Spanish an elaborate paper on the birds of Porto Rico, under the title 'Apuntes para la Fauna Puerto-Riqueña' (*Anal. de la Soc. Esp. de Hist. Nat.* VII, 1878, Aves, pp. 141-422), and papers on the mammals of Cuba and Porto Rico, besides various minor papers on the ornithology of these islands.

His researches and writings, however, were not restricted to mammals and birds, his entomological publications being quite extensive, and he published also on other branches of natural history.

Dr. Gundlach was a friend and correspondent of Baird, Brewer, and Lawrence, and was known through correspondence or personally to many of the younger American ornithologists. He was a naturalist in the fullest sense of the word, and retained his enthusiasm for his favorite pursuits to the last.¹ His extensive collections in all departments of Cuban natural history he deposited sometime since in the Havana Institute.

CLARENCE A. SMITH, an Associate Member of the American Ornithologists' Union, died in New York City, May 6, 1896, at the age of twenty-two years. Though he had published but little on ornithology he was a keen observer and an expert collector, and was possessed of an extended

¹ See *Auk*, IX, 1892, pp. 471-473. 'In Cuba with Dr Gundlach,' by Charles B. Cory.

knowledge of birds derived from his field experiences in various parts of the United States and Mexico. His valuable collection of exceptionally well-prepared bird skins and eggs has been presented to the American Museum of Natural History.

THROUGH the enterprise of Mr. Charles B. Cory, Palm Beach, Florida, has a museum of Natural History, devoted especially to the fauna of Florida. At the suggestion of Mr. H. M. Flagler, the erection of a building for this purpose was begun some two years ago, and was soon ready for occupation, the building being a wooden structure, 40 by 100 feet, and two stories in height. It already contains all of the Florida mammals but two, and a nearly complete collection of the birds of Florida, mounted after approved modern methods. It includes ten large groups, devoted to the Panther, Alligators and Crocodiles, a Heron rookery, and various other characteristic Florida birds. While the Museum is devoted primarily to the Vertebrate Zoölogy of Florida it will also include the insects and shells, the intention being to bring together a complete representation of the animal life of Florida. A prominent feature is a collection of the implements and costumes of the present Seminole Indians. It is proposed to add later an Aquarium, devoted mainly to the fresh-water fishes of the State. At present the Museum is open free to the public during certain hours each day, but when completed will be free only on certain days, a small admittance fee being charged on other days.

WE have received the prospectus of a new monthly illustrated ornithological journal, 'The Osprey', published by the Osprey Company, Galesburg, Ill., under the editorship of Walter A. Johnson, Dr. A. C. Murchison and Chester Barlow.

'THE NIDIOLOGIST' has again changed its place of publication, having returned to its former home, Alameda, California, after a short but successful career in New York City. We trust the change will not detract from its future usefulness, or diminish the interest of its pages.

BY A recent Act of Congress the name of the Division of Ornithology and Mammalogy of the United States Department of Agriculture, under the direction of Dr. C. Hart Merriam, as Chief of the Division, has been changed to the much more descriptive and appropriate title of 'Biological Survey,' the change of name to go into effect July 1, 1896. It is gratifying to have the character of the important work Dr. Merriam has for some years been conducting so successfully recognized officially by the Congress.

RESPECTING Mr. D. G. Elliot's expedition to Africa, mentioned in a former number of 'The Auk' (XIII, p. 196) we quote the following from the June issue of 'The National Geographic Magazine' (VII, p. 219);

"Consul Masterson reports that Prof. D. G. Elliot and Messrs. Akeley and Dodson arrived at Aden, April 14, where they procured 70 Somalis, 80 camels, and 20 horses and mules. A week later they crossed to Berbera, on the Somali coast. An absence of 10 months is planned, during which they will cross Somali into Gallaland and pass to the south of the Juba River. The main object of the journey is the collection of mammals, but no effort will be spared to make the zoölogical collection varied and complete."

THE EDITOR of 'Natural Science,' in commenting (Nat. Sci., April, 1896, p. 218) on the discussion on zoölogical nomenclature held by the Zoölogical Society of London at its meeting of March 3 last, observes: "The discussion turned chiefly upon the following questions:—First, may the same generic names ever be used for both animals and plants? Secondly, may the same term be used for the generic and trivial name of a species, as in the well-known instance of *Scomber scomber*? Thirdly, are we to adopt as our starting-point the tenth edition of Linné's *Systema Naturæ* in preference to the twelfth edition? These questions are answered in the affirmative by the German code, and in the negative by the original Stricklandian. We do not propose to discuss them here: it is natural that there should still be found, especially among the older zoologists of this country, many to support the old-established British practices; in this, as in all other matters of nomenclature, convenience, not principle, is concerned, and it cannot be gainsaid that the general usage of zoologists, at all events in other parts of the world, becomes daily more and more in harmony with the rules adopted by the German Society."

He advocates the preparation of a complete and correct list of the names of all animal species, fossil as well as recent, and adds, "then it would at all events be perfectly possible for the zoologists of the world to accept that list, and to say, 'Whether these names be right or wrong according to this or that code of nomenclature, we do not know and we do not care; but we bind ourselves to accept them in their entirety, and we hereby declare that the date when this list was closed for the press shall henceforward be the date adopted as the starting-point for our nomenclature.'"

"We have" he continues, "put this proposition in a broad manner; there are, of course, numerous minor points to be taken into consideration. The preparation of a mere list would be an enormous undertaking: we learn from Dr. David Sharp and the workers on the *Zoological Record* that there are 386,000 recent species; no one has reckoned the number of extinct species. Some such work as the 'Index generum et specierum animalium,' now being compiled with a minimum of support and under constant difficulties by Mr. Charles Davies Sherborn, must form the basis of any such synopsis as that here proposed. The first duty of naturalists is to help Mr. Sherborn, who works at the British

Museum under a Committee of the British Association. We also have to consider what is to be done when our list is completed. First of all, it must constantly be kept up to date. It seems to us that some restriction will have to be laid upon the place and manner of publication of new specific names, and we would suggest that, when the time comes, no specific name should be recognized unless it be entered by the author at some central office, together with a properly published copy of the work in which the description appears. The name would then be checked, dated, and placed at once in the Index."

This is very good, except the suggestion that "some restriction will have to be laid upon the place and manner of publication of new specific names," etc., which we consider both unwise and impracticable; for an author publishing in well-known scientific journals and the proceedings, etc., of scientific societies should not, and indeed could not, be deprived of recognition simply because, through accident or carelessness, or even disinclination, he should fail duly to report at "some central office," of record, without overthrowing the hitherto universally recognized rules regarding what constitutes proper publication. It is enough that he conform to these, although for his own interest, he might well send copies of his publications to designated offices of record.

In the May number of the same publication (*Nat. Sci.*, May, 1896, p. 302), the editor has the following judicious comment, in reply to a correspondent, respecting the 'Law of Priority.' "Obviously," he says, "some such law is a necessity, if we are to avoid the multiplication of synonyms or to have any attempt at a world-wide set of names. The difficulties in the application of the law are of two kinds. First, is it to be retrospective? and, if not, where is the line to be drawn, and who is to draw it? Secondly, when authors have published unintelligible or doubtful descriptions, who is to be the judge? These matters cannot be left to the individual caprice of naturalists, even so distinguished as Mr. Cunningham. It is for this reason that we made the proposal published in our last number. We say,—let the Law of Priority work! in most cases it will answer. Then let the doubtful cases be adjudicated on by specialists appointed *ad hoc*, and let their decision be accepted. Fixity of nomenclature of course is not anticipated, for that could be the result only of the stagnation of systematic zoology. Nevertheless, the acceptance of our proposal would do away with the changeableness that depends on mere whim, or on literature rather than on fact. We realize, indeed we have insisted, that the full carrying out of our ideas cannot be yet; the index to all published names must first be completed."

CORRESPONDENTS may be interested to know that the editor of 'The Auk' will be absent on a European tour till about September 1. Letters concerning 'The Auk' may be addressed to the Assistant Editor, Mr. Frank M. Chapman.



NELSON'S SPARROW.

ACADIAN SPARROW.

THE AUK, VOL. XIII.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XIII.

OCTOBER, 1896.

NO. 4.

THE SHARP-TAILED SPARROW (*AMMODRAMUS*
CAUDACUTUS) AND ITS GEOGRAPHICAL
RACES.

BY JONATHAN DWIGHT, JR.

Plate IV.

THE SHARP-TAILED SPARROW is a bird that can boast of considerable antiquity among North American species and it has been figured more than once by early writers, but the two geographical races that have been described of late years are now figured for the first time on the accompanying plate. The specific name dates from 1788, when the bird was called by Gmelin *Oriolus caudacutus* (Gmelin, Syst. Nat., I, pt. i., 1788, 394). His description, however, is practically a translation into Latin of Pennant's description of a bird he calls the Sharp-tailed Oriole (Pennant, Arctic Zoöl., II, 1785, 261), which Latham also describes (Latham, Synop. Birds, I, pt. 2, 1782, 448, pl. xvii), giving a fairly recognizable colored plate and stating that he is indebted to Pennant for the drawing of the bird as well as for the description. Neither Pennant nor Latham made use of any scientific name and therefore Gmelin becomes the authority for

a name that still survives. That it is applicable to true *caudacutus*, and not to either of the subspecies, becomes most probable when we read Gmelin's description in conjunction with Latham's plate, both based on the same material, a specimen from New York in Mrs. Blackburn's collection. We read, "pectus, femora et crissum pallide flavescentia, maculis fuscis," a statement which seems to indicate the paler buff and distinct streaking of *caudacutus* as compared with *nelsoni*, and other parts of the description contribute to show that pale *subvirgatus* was not the bird in hand,—these being the three forms to which the old description might apply.

Wilson, apparently unaware of previous recognition, figured and described an undoubted *caudacutus*, which he named *Fringilla caudacuta*, Sharp-tailed Finch (Wilson, Amer. Orn., IV, 1811, 70, pl. xxxiv, f. 3), and Audubon also figured and accurately described the species (Audubon, Orn. Biog., II, 1834, 281, pl. cxlix, V, 1839, 499; Birds Am. III, 3, 1841, 108, pl. clxxliv,). It is again poorly figured by DeKay (Zoöl. N. Y., pt. ii, 1844, 164, pl. 67, f. 154) and from him received the curious name of 'Quail-head,' so called from a fancied resemblance to the markings of the Bob-white.

The name *caudacutus*, once applied, seems to have been adopted by all later writers, save Nuttall (who saw fit to call the bird *Fringilla littoralis* for reasons best known to himself), and consequently the bird has not been burdened with the multiplicity of names that so often fall to the lot of early described species.

In 1875 a smaller, brighter colored race was separated under the name *nelsoni* (Allen, Proc. Bost. Soc. N. H., xvii, March, 1875, 293) on the evidence of a number of specimens obtained by Mr. Edward W. Nelson and others on the Calumet Marshes near Ainsworth, Illinois, in September and October, 1874. This has proved to be the inland representative of its strictly littoral relatives.

In 1887 I described a race from the marshes of New Brunswick, Canada (Dwight, Auk, IV, July 1887, 233) to which I applied the name *subvirgatus*. It is a comparatively pale race that seems to have closer affinities with *nelsoni* than with its nearer breeding neighbor *caudacutus*, and its recognition raises interesting questions of distribution yet to be solved.

In 1891 a race called *becki* was described from California (Ridgway, Proc. U. S. Nat. Mus., XIV, 1891, 483) on the strength of a single specimen. This proved to be a straggling *nelsoni* so that *becki* became a mere synonym.

I have briefly sketched the history of the Sharp-tailed Sparrow and its races and only touched upon a few essential points, because it is beyond the scope of the present paper to treat the subject exhaustively. It is rather my purpose to emphasize by collation the facts of which we are already possessed and call attention to the gaps in our knowledge of these birds, well-known as they may seem to be.

PLUMAGE.

First of all let us grasp the characters by which the three forms may be distinguished. I went over them at some length in my early article and to-day, after a lapse of nine years, having examined fully five times as much material as was originally before me, I find that there is little to modify the conclusions then reached.

Ammodramus caudacutus is, at all seasons, so distinctly streaked below with black, that seldom does a specimen present itself that can for a moment be confounded with either of the other races, when once this difference is appreciated by specimens in hand. Besides, the birds are large, with large bills and are richly colored when in unworn plumage, although with all the members of this genus the feathers are rapidly and extensively abraded. There is considerable individual variation, and, it may be noted, winter specimens from South Carolina are as a rule richer in color and more heavily streaked than northern birds.

Ammodramus caudacutus nelsoni is a small form, this being most readily apparent in the bill and length of wing. In coloration it is very similar to *caudacutus*, though usually richer in browns and buffs, especially the ochraceous, buffy yellow wash of the breast and flanks. The streaking below is obscure, the lines dusky, suffused and narrow as compared with the other forms. In spring plumage, and occasionally in the fall, the lines are more definite yet characteristically narrow.

Ammodramus caudacutus subvirgatus is intermediate in size between *caudacutus* and *nelsoni*. It lacks the distinct streaking of

the former and the bright colors of the latter, being a pale grayish looking bird, and the edgings of the back feathers are ashy or pearl-gray, according to season, instead of pure white, as in *nelsoni*. The accompanying plate is intended to show these differences, and on it are figured the type of *subvirgatus* (No. 1261 ♂ adult, Hillsborough, New Brunswick, July 19, 1886, J. Dwight, Jr.), and a breeding male *nelsoni* taken by Dr. Louis B. Bishop in Towner Co., North Dakota, July 5, 1895 (L. B. B. No. 2071). It seems preferable to thus compare two breeding males rather than figure the type of *nelsoni* which, taken in the autumn, is very possibly a migrant. The coloring is most excellent save in the tarsus and foot of *nelsoni*, which should be of a purplish flesh color. The bills do not show the differences in size that usually are obvious.

In order to bring out as definitely as possible the points of difference (appreciable at any season in all birds, save those in first plumage) between these allied races I will present them in parallel columns :

	<i>caudacutus.</i>	<i>nelsoni.</i>	<i>subvirgatus.</i>
Lateral crown stripes.	Deep brown.	Deep, rich brown.	Paler, greenish brown.
Nape and back.	Browns prevail.	Browns prevail.	Grays prevail.
Outer edgings of back feathers.	Ashy or buffy.	White and conspicuous.	Ashy or pearl-gray and obscure.
Edgings of secondaries and tertiaries.	Rusty.	Bright, rusty buff.	Paler.
Breast and sides of head.	Buffy and ochraceous tints intense.	Buffy and ochraceous tints more intense.	Tints pale.
Breast and flank streaks.	Distinct black and broad.	Obscure, or suffused and narrow.	Obscure, or suffused and medium width.
Abdomen.	Clear white.	Clear white.	Dingy white.
Bill.	Large and long.	Small and short.	Medium.
Measurements.	Largest size.	Smallest size.	Medium size.

Typical birds are easily recognized when birds of like season are compared, but difficulties arise in determining certain fall migrants or winter birds (of which there are a large number in collections) that show intergradation between *nelsoni* and *subvirgatus*. They are taken on the Atlantic coast at various points

and we can only suppose they come from unknown breeding grounds. When we realize that *nelsoni* has not been recorded as breeding east of about 87° W. long. while *subvirgatus* has not been found west of about 70° W. long., there is ample ground for such supposition.

DISTRIBUTION.

Ammodramus caudacutus is restricted in the breeding season to the salt marshes of the Atlantic coast from Virginia to Massachusetts. North of the latter named State, in the limited marshes of the New Hampshire and Maine coasts, it is probable that *subvirgatus* would be found. In fact a few stragglers have been secured that, singularly enough, approach more nearly to *nelsoni* than to *caudacutus* as would naturally be expected. One specimen is from Cambridge, Mass., May 31, another from Revere, Mass., June 7, and a third from North Madison, Conn., June 9. These birds may have been late migrants but the probability is they were breeding. It is obvious therefore that breeding specimens from the Maine coast are greatly to be desired. A few *caudacutus* linger through the winter as far north as New Jersey (Stone, Birds E. Pa. and N. J., 1894, 114), the bulk passing to the South Atlantic States and even reaching Tarpon Springs, Florida, on the Gulf coast (Scott, Auk, VI, 1889, 322).

A. c. nelsoni has been sparingly found during the breeding season in Northern Illinois, in Wisconsin, in Minnesota, in Kansas, in the Dakotas, and in Manitoba. It seems to be a comparatively rare species and spring records are few and far between. Large numbers of migrants are found, however, at many points on the Atlantic coast from Massachusetts to South Carolina, they have been taken at Corpus Christi, Texas (Chapman, Bull. Am. Mus. N. H., III, No. 2, 223), and a straggler to the vicinity of San Francisco, California, was described as a new race, to which reference has already been made. It is probable that the birds found at Galveston (Nehrling, Bull. N. O. C., VII, 1882, 12) were of this race and not *caudacutus* as recorded, and the same may be true of the record of *caudacutus* for Ottawa, Ontario (E. E. Thompson, Auk, VI, 1889, 204).

A. c. subvirgatus is peculiar to the fresh and salt water marshes of the Maritime Provinces of Canada, especially those bordering on the Bay of Fundy and the Gulf of St. Lawrence. Strangely enough it has never been taken in Nova Scotia, although it undoubtedly occurs there, for I have observed it within two or three miles of the boundary line when rambling over the meadows of the Petitcodiac River in New Brunswick, not far from the type locality. Since my discovery of the birds about ten years ago I have found them breeding at Tignish, Prince Edward Island, where they were recorded as *caudacutus* long before *subvirgatus* was separated (Brewster, Bull. N. O. C., II, 1877, 28), at Bathurst, N. B., and at Rivière du Loup, Quebec, on the south shore of the St. Lawrence. They have also been found a few miles west of the last named place at Kamouraska (Dionne, Oiseaux de Quebec, 1889, 82). West of this I have not found them, neither at L'Islet nor on the marshes between the city of Quebec and Ste. Anne de Beaupré. Consequently there appears to be a wide gap between the headquarters of this form and those of *nelsoni*,—over one thousand miles. In migration the birds pass as far south as South Carolina (Brewster, Auk, VII, 1890, 212) mingling with the true *caudacutus* and *nelsoni* when Massachusetts is reached. I have already spoken of three birds of this race that apparently were stopping to breed in southern New England. One was recorded as *nelsoni* (Henshaw, Auk, III, 1886, 486) and it might well be compared with some of the pale *nelsoni* from the west, but I can absolutely match it with occasional specimens from the type locality of *subvirgatus*, which themselves approach very close to exceptionally pale *nelsoni*. This is to be expected in any large series of birds, especially those which are split into races, but if it should be proved that *subvirgatus* regularly breeds on the same ground as *caudacutus*, the question of considering *nelsoni* as a separate species with *subvirgatus* as its eastern race may be seriously discussed.

HABITS.

A few words about the habits of these birds may not be amiss although there is little to add to what has already been written

by numerous observers. The three races are very much alike in habits and their chief trait is secretiveness. True *caudacutus* may be found on salt marshes hiding successfully under the sheets of sea-weed and drift brought by the tide and left to dry on the banks of the ditches, or nimbly racing through the short grass and weeds peculiar to such localities. Their wheezy gasp of a song may be heard from tussock, stake or block of drift wood and on the least alarm, the birds vanish, generally preferring not to take wing. During the migration they are more reckless in exposing themselves and often cling to tall reeds or perch on them when pursued. They usually go in small bands associated with the other races and with *Ammodramus maritimus*, a species that is a bosom friend at all seasons. The nests are hidden in drift or protected by a tussock of grass.

Of *nelsoni* little seems to be known. Mr. E. W. Nelson has a little to tell of their habits and even states that they "utter a short unmusical song" in the autumn (Nelson, Bull. Essex Inst., VII, 1877, 107). He found them abundant on the Calumet Marshes, near Chicago, Illinois, and observed a few in June, probably breeding. Hitherto no nest has been taken, although a correspondent writes that he secured one some years ago in this very locality. As he sold the nest and eggs, and has lost all the data, and I have been unable to trace the purchaser, I think it best to say no more about it and wait for an authentic set to be secured, before attempting a description. A brief account is given of this race by Goss (Birds of Kansas, 1891, 449) and he speaks of the song as "a short weak unmusical twittering warble." He observed two young in first plumage, of which no specimens have as yet been taken, so far as I know.

Since my description of *subvirgatus* was published nine years ago I have had opportunity nearly every summer to study this bird and yet there is but little to add to my original observations. The birds are scattered rather abundantly in the breeding season over immense tracts of meadow land along the Petitcodiac River in New Brunswick. I have traced them for twenty miles and notice that they most frequent certain damp spots and utilize the narrow ditches as highways. These meadows are diked off from the tide, and are in no sense salt marshes where the tide creeps at will. A

luxuriant growth of grass covers them and, as I have before stated, the Bobolink and Savanna Sparrow are next door neighbors to *subvirgatus*. Quite different are the salt marshes of Prince Edward Island and of the St. Lawrence where the birds have been found. There short grass, bogs and few ditches are the rule, though the birds seem equally at home. They may fly considerable distances when disturbed, but are more likely to dive into the grass and defy all efforts to again flush them. Their flight is much steadier than that of the Savanna Sparrow and lacks the jerky undulations peculiar to that bird. I have already made two attempts to describe the song (Auk, IV, 1887, 239; Chapman's Birds E. N. A. 1895, 297), which varies little from that of *caudacutus* and much resembles the choking gasp of *Ammodramus maritimus*.

All my efforts to secure a nest have proved unsuccessful in spite of having devoted much time to the task. The difficulties of systematic search are many and, so far, chance has not favored me.

In closing I may say that the study of the Sharp-tails is beset with many difficulties and necessitates excursions devoted almost exclusively to their pursuit. Their exasperating shyness is another factor to baffle the bold observer who, regardless of mud and mosquitoes, invades their stronghold; but perseverance must win in the end and it is to be hoped only a few more years will be required before we are in possession of the facts now wanting to complete our knowledge of these marsh-loving birds.

SUMMER BIRDS OF THE ANTHRACITE COAL REGIONS OF PENNSYLVANIA.

BY R. T. YOUNG.¹

THE study of the birds which breed in the anthracite coal belt of Schuylkill, Carbon, and Luzerne Counties, Pa., is one of much interest to the ornithologist.

The fauna of this region is Alleghanian with, however, traces of the Carolinian fauna. Passing to the south of the Blue Mt.,

¹ Read before the Delaware Valley Ornithological Club of Philadelphia.

from Schuylkill into Berks County, the fauna merges gradually into the Carolinian, while in the northern portion of Luzerne County the Canadian element is found.

This region then, may be looked upon as intermediate between the Carolinian fauna on the south, and the Canadian on the north, which, together with the fact that ornithologists have given far more attention to the country farther north among the higher Alleghanies than they have to this section, makes it a field well worth studying.

The intermingling of Canadian and Carolinian species is well illustrated by the occurrence of the Junco near Penn Haven Junction, Carbon County, and the presence of the Yellow-breasted Chat at Harvey's Lake, as recorded by Mr. Witmer Stone (Proc. Acad. Nat. Sci. Phila., 1891, p. 431).

The notes from which this paper is written were gathered during June and July, 1895, while I was staying at Pottsville, Schuylkill County. Although I covered a considerable range of territory on various trips, the notes obtained are far from complete, as I had very little time to devote to collecting, and consequently my visits to many places were extremely brief.

The bulk of my time was spent in the near vicinity of Pottsville and in the neighborhood of Hazleton, Luzerne County, short trips being made to Hamburg, Berks County; Rock Glen, Lumber Yard, Nescopeck and Harvey's Lake, Luzerne County; while some work was done at Delano, Schuylkill County; Mt. Carmel, Columbia County, and along the Black Creek from Weatherly to Penn Haven Junction in Carbon County.

The appearance of the country throughout the coal-fields is bleak and uninviting. The general altitude varies from 1000 to 1800 feet; in no case I believe exceeding 2000 feet.

At Pottsville the Schuylkill River turns abruptly to the east and follows a pleasant farming valley for about twenty miles to Tam-aqua. This valley is the southeastern boundary of the coal beds. To the northwest of it from near Mauch Chunk on the east to some distance west of Pottsville, the country is hilly and broken; ridge succeeding ridge with long narrow valleys between, the ridges rising usually not more than 100 to 200 feet above the valleys. The barren, rocky soil is covered with a scanty growth

of chestnut and oak in some places, which in others gives way to the pitch pine, while scrub oaks and blueberry vines form a thick undergrowth.

In many places dead trees and stumps form convenient nesting-sites for House Wrens, Crested Flycatchers and Flickers. These birds are more numerous in such localities than elsewhere, the merry song of the House Wren in particular being heard on every side, while the Towhee and Chestnut-sided Warbler are also most characteristic species.

Besides the Schuylkill River the principal streams of the region visited are Black and Nescopeck Creeks. The former, which is a stream of thirteen miles in length, has its source in the mine streams of Hazelton and empties into the Lehigh River at Penn Haven Junction, falling in its course 800 or 1000 feet. From Weatherly the stream flows through a deep, narrow gorge with the hills rising almost perpendicularly on either side, some 300 feet. Some little hemlock growth covers these hills while along the stream are found a few wild cherry trees together with some pine, aspen, and birch.

From Tomhicken the Nescopeck Creek flows to the west joining the east branch of the Susquehanna at Nescopeck. Along the hills between which it flows there is also a considerable growth of hemlock and a few white pines. There is also some little hemlock near Pottsville.

Along the edges of the streams in the lower parts of the country, as at Pottsville and Weatherly, the rhododendron grows in wild profusion in the denser woods, in some places forming almost impenetrable thickets, while the laurel seems more abundant on the open hillsides and is not restricted so much to the lower valleys.

One of the most characteristic birds of these rhododendron thickets near Pottsville is the Hooded Warbler, which may be heard singing occasionally quite late in August. The distribution of this species seems worthy of note. Occurring as a common summer resident in the swamps of southern New Jersey, it is not found, so far as I know, anywhere in the vicinity of Philadelphia, except as a rare migrant, and then appears rather commonly along the Blue Ridge and near Pottsville.

LIST OF SPECIES OBSERVED.

My time was too short to enable me to give a complete list of birds at each locality I visited, so I have endeavored merely to give as comprehensive a list as possible of the species observed within the limits of the coal-fields.

1. *Ardea virescens*. GREEN HERON.—This was the only Heron noted, one being seen at Hamburg and one family at Pottsville.

2. *Actitis macularia*. SPOTTED SANDPIPER.—While fairly common along the Schuylkill at Hamburg and the Susquehanna at Nescopeck, I did not observe this bird anywhere through the coal country during the breeding season, although I thought I distinguished its note at Lumber Yard on one or two occasions.

I saw Spotted Sandpipers on Tumbling Run dam on or about August 4, a point I had not visited about Pottsville during the breeding season.

3. *Ægialitis vocifera*. KILLDEER PLOVER.—The Killdeer does not seem to extend north of the Blue Ridge; a few at Hamburg being the only ones I noted.

4. *Bonasa umbellus*. RUFFED GROUSE.—Occurs at Nescopeck, just north of the coal region but I did not find it anywhere to the south.

5. *Colinus virginianus*. BOB-WHITE.—A Quail was heard whistling once or twice at Lumber Yard.

6. *Zenaidura macroura*. DOVE.—Doves, while pretty generally distributed, seemed rather scarce through the mountains.

7. *Falco sparverius*. SPARROW HAWK.—One or two noticed for several days along Black Creek above Penn Haven Junction and I have no doubt they breed there.

Of the other rapacious birds which may breed throughout this region, I know but little. I did not see any Owls and the three or four large Hawks which I noticed I failed to identify positively.

8 and 9. *Coccyzus americanus et erythrophthalmus*.—Both species of Cuckoo were observed but as to their comparative abundance I cannot say. They seemed rather more common at Pottsville than elsewhere.

10. *Ceryle alcyon*. KINGFISHER.—One was seen at Nescopeck and about the end of August I saw one several times at Tumbling Run, but cannot say as to whether it bred near there or not.

11. *Dryobates villosus*. HAIRY WOODPECKER.—One was seen at Lumber Yard and also at Rock Glen.

12. *Dryobates pubescens*. DOWNY WOODPECKER.—Seen at Rock Glen.

13. *Colaptes auratus*. FLICKER.—Flickers seemed rather scarce throughout the region, a few being recorded near Hazleton and Penn Haven Junction.

14. *Antrostomus vociferus*. WHIP-POOR-WILL.—I recorded but one Whip-poor-will,—at Tumbling Run near Pottsville.

15. *Chordeiles virginianus*. NIGHTHAWK.—Quite common and pretty generally distributed.

16. *Chætura pelagica*. CHIMNEY SWIFT.—Occurs commonly throughout the region, seeming rather more abundant in the towns than on the mountains.

17. *Trochilus colubris*. HUMMINGBIRD.—A nest with two full-fledged young was found at Black Creek Junction, July 24.

Passing by the spot a few days previous my attention was attracted by the vicious attack of a Hummer on the head of a defenseless Catbird. This led to the discovery of the nest, situated on the branch of a pine tree about twelve feet from the ground. The only other points at which I observed this species were Hamburg and Harvey's Lake.

18. *Tyrannus tyrannus*. KINGBIRD.—Kingbirds were quite common throughout the region. I found a nest with three eggs at Pottsville, on June 30.

19. *Myiarchus crinitus*. CRESTED FLYCATCHER.—More or less local in distribution, being more common around Delano and Hazleton where dead trees are plentiful. At Pottsville I did not see them, though I noted several at Hamburg.

20. *Sayornis phœbe*. PHŒBE.—I have one record of the Phœbe from near Penn Haven Junction, where I saw one or two and during August. I also saw several near Audenried, in the western point of Carbon County.

21. *Contopus borealis*. OLIVE-SIDED FLYCATCHER.—My most interesting find of the summer was a set of two eggs of the Olive-sided Flycatcher at Lumber Yard, five miles east of Hazleton, on July 4; constituting, so far as I can ascertain, the first positive record of the breeding of this species in the State.

I first noticed this species at Delano on June 18, when I heard its note but failed to identify it. After I had taken the nest and eggs and shot the female, on July 6, the male still stayed in the same locality for several days, uttering its loud note and seeming particularly troubled when I came near. The last I saw of it was at Delano, on July 27. When I was securing the nest both birds were particularly bold, especially the female, coming near me and protesting vociferously against my intrusion.

22. *Contopus virens*. WOOD PEWEE.—Generally distributed but not very common in the mountains.

23. *Empidonax minimus*. LEAST FLYCATCHER.—One heard at Hazleton and one at Mt. Carmel. At Hamburg I saw two or three pairs, and on June 4 took a nest from an apple tree about twenty feet from the ground.

24. *Cyanocitta cristata*. BLUE JAY.—Two or three seen near Penn Haven Junction, and one pair at Weatherly, and two or three at Rock Glen. During August I found them near Audenried.

25. *Corvus americanus*. CROW.—Fairly common throughout the region. As their breeding season was pretty well over when I was there, they seemed rather unsettled in their movements.

26. *Molothrus ater*. COWBIRD.—Several seen at Hamburg, June 16, and a flock of four or five at Pottsville, July 11. North of this I did not find them, very likely because the country was not to their taste.

27. *Sturnella magna*. MEADOWLARK.—Not found north of Schuylkill Haven, except at Nescopeck, where I saw one.

28. *Icterus galbula*. BALTIMORE ORIOLE.—One seen at Lumber Yard early in June, but as it was seen only once I do not consider it a breeder there. This species was common at both Hamburg and Nescopeck.

29. *Quiscalus quiscula*. PURPLE GRACKLE.—Quite scarce all through the mountains, being noted at Hazleton, Pottsville and Nescopeck, where, however, but a few were seen.

30. *Carpodacus purpureus*. PURPLE FINCH.—Quite generally distributed and fairly common on the mountains.

31. *Spinus tristis*. GOLDFINCH.—While common at Pottsville and also noted at Rock Glen and Nescopeck, this species was not seen elsewhere in the coal regions.

32. *Poocætes gramineus*. VESPER SPARROW.—Several seen at Pottsville and Hamburg but none farther north.

33. *Ammodramus sandwichensis savanna*. SAVANNA SPARROW.—Occurs commonly at Hamburg and a few at Pottsville where I found a nest with four half-fledged young and one unfertile egg on July 21.

34. *Spizella socialis*. CHIPPING SPARROW.—Common throughout the region.

35. *Spizella pusilla*. FIELD SPARROW.—Common throughout the region.

36. *Junco hyemalis*. JUNCO.—A pair were observed at Black Creek Junction about the middle of July.

37. *Melospiza fasciata*. SONG SPARROW.—Common everywhere.

38. *Pipilo erythrophthalmus*. TOWHEE.—Common throughout the mountains, but I did not observe it at Pottsville during June or July. I saw them, however, in August in a spot not before visited, so they probably bred there.

39. *Passerina cyanea*. INDIGO BUNTING.—One of the commonest birds of this region. A nest with three fresh eggs, found July 14, at Pottsville seems a rather late record.

40. *Piranga erythromelas*. SCARLET TANAGER.—Several seen at Weatherly and near Penn Haven Junction, also one at Rock Glen.

41. *Progne subis*. PURPLE MARTIN.—I observed one pair several times in Hazleton.

42. *Chelidon erythrogaster*. BARN SWALLOW.—Pretty generally distributed, though not very common in the mountains, this being probably due to the few good breeding sites available.

43. *Clivicola riparia*. BANK SWALLOW?—On one occasion I saw three

or four Bank, or Rough-winged Swallows on the Black Creek near Penn Haven Junction. I cannot say which species they were, however. I also saw them at Nescopeck, but failed to procure specimens there either.

44. *Ampelis cedrorum*. CEDARBIRD.—Very common throughout the region. I saw a flock of fifty or sixty of this species at Delano, on June 1, and observed them flocking again early in August.

45. *Vireo olivaceus*. RED-EYED VIREO.—Generally common.

46. *Vireo gilvus*. WARBLING VIREO.—Several seen at Nescopeck, but at no other point.

47. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Observed at nearly every place visited. I found this species with large young at Harvey's Lake, on June 9, while at Pottsville, on July 7, I found a nest of four young just ready to fly.

48. *Helmitherus vermivorus*. WORM-EATING WARBLER.—Noticed at Pottsville on August 11, in company with a flock of Black and White Warblers and Chickadees.

49. *Compsothlypis americana*. PARULA WARBLER.—A few at Harvey's Lake, on June 9. A nest which I found was suspended something over twenty feet from the ground, very like a Vireo's nest, from a crotch in a branch. The moss must have been gathered by the birds as there seemed to be but little of it on the tree where the nest was. It contained one egg.

50. *Dendroica æstiva*. YELLOW WARBLER.—Several were seen in Pottsville and one or two in Hazleton. I heard them singing steadily till about the end of July, when they ceased and were no more in evidence.

51. *Dendroica maculosa*. MAGNOLIA WARBLER.—I found one family at Pottsville.

52. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—Much commoner on the top of the mountains than lower down. At Delano I found it breeding in the scrub oaks, and at Harvey's Lake I found a nest in the laurel.

53. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Pretty generally distributed throughout the coal belt. I found it breeding at Pottsville and saw one or two families near Penn Haven Junction. I also saw it at Mt. Carmel and near Audenried, and found three or four at Rock Glen.

A nest, which I found at Pottsville on June 23, was situated on the limb of a chestnut tree about thirty feet up and was covered by grape vines.

54. *Seiurus aurocapillus*. OVEN-BIRD.—Pretty common throughout the region.

55. *Seiurus motacilla*. LARGE-BILLED WATER-THRUSH.—On June 16, at Hamburg, I found a nest of this species containing four young but a few days old. It was situated in a bank by a stream of running water.

This record is of some interest as bearing out the experience of others in finding the Water-Thrush breeding well up along our principal rivers at Delaware Water Gap and one or two other points.

56. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—A common resident throughout, the region being perhaps more common on the mountains than lower down.

57. *Icteria virens*. YELLOW-BREASTED CHAT.—Found at Hazle Creek Junction, Hazleton, Morea and Mt. Carmel.

58. *Sylvania mitrata*. HOODED WARBLER.—Rather common at both Hamburg and Pottsville, but not extending north of the latter place.

59. *Sylvania canadensis*. CANADIAN WARBLER.—A pair seen at Delano, on June 29, and another at Hazle Creek Junction, June 19. Both pairs were seen in low damp ground and were feeding their young.

60. *Setophaga ruticilla*. REDSTART.—One family was seen at Pottsville and several individuals at Harvey's Lake.

61. *Galeoscoptes carolinensis*. CATBIRD.—Common throughout the region.

62. *Harporhynchus rufus*. BROWN THRASHER.—Generally disturbed, but not common.

63. *Troglodytes ædon*. HOUSE WREN.—Generally common, especially around Delano and Hazleton in the dead trees. I did not see them about Penn Haven Junction.

64. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Saw three or four at Mt. Carmel and one at Rock Glen.

65. *Parus atricapillus*. BLACK-CAPPED CHICKADEE.—A few seen at Pottsville, Hazleton and Penn Haven Junction.

66. *Turdus mustelinus*. WOOD THRUSH.—While pretty generally distributed, the Wood Thrush was rather more common at Pottsville and Rock Glen than further up the mountains.

67. *Turdus aonalaschkæ pallasii*. HERMIT THRUSH.—A pair observed near Pottsville and one also heard at Rock Glen, but I did not secure any specimens.

68. *Merula migratoria*. ROBIN.—Rather scarce all through the coal-fields.

69. *Sialia sialis*. BLUEBIRD.—On July 22 I heard three or four Bluebirds near Hazleton.

FEEDING HABITS OF THE ENGLISH SPARROW AND CROW.

BY SYLVESTER D. JUDD.

IN 'The English Sparrow in America' (Bull. U. S. Department of Agriculture) Prof. W. B. Barrows has shown what a pest the Sparrow is. I wish to comment upon several of the hundreds of

interesting facts that Prof. Barrows has presented in such admirable form. First I shall speak about the destruction of dandelion seeds. In May, 1894, at Cambridge, Mass., and during the last two springs here in Washington, Sparrows have been observed eating dandelion seeds.

After the yellow petal-like corollas have disappeared, the flower presents an elongated, egg-shaped green body with a downy tuft at the upper end. It is in this stage of the flower cycle, that the dandelion suffers from the attacks of the English Sparrow. The bird removes several of the scales of the inner involucre by a clean cut close to the receptacle, thus exposing the plumed seeds, or, more properly speaking, achenes. He seizes a mouthful of them between the plume and seeds, and then by a cut of the bill the plumes are lopped off, while the seeds are swallowed. In many cases, especially when hunger presses, the trouble of removing plumes is not taken. The Sparrow generally drops a score of seeds in tearing open a flower, and usually leaves the few seeds that cling to the periphery of the receptacle. The mutilation caused by the Sparrow's beak can be detected until the flower stalk dries and falls.

On the 29th of last April, I picked every dandelion flower stalk from a circle six feet in diameter on the grounds of the U. S. Department of Agriculture, where the lawn had a week previous been yellow with the flowers. One hundred and thirty-five of the stalks showed the unmistakable mark of the Sparrow's bill. More than half of the dandelions that bloomed in April on the lawns of the U. S. Department of Agriculture were damaged by Sparrows.

Later in the season, Sparrows feast upon the seeds of crab grass (*Panicum sanguinale*), which grows in profusion about Washington. The seeds of another crab grass (*Eleusine*), not included in Prof. Barrow's list, were taken from a stomach in June, 1895. In early spring the Sparrow often may be seen eating the first tender blades of grass. I have also seen it eating the leaves of *Chelidonium majus*. In Cambridge and Washington the Sparrows often subsist to quite an extent upon the seeds of chickweed (*Stellaria* and *Cerastium*).

Along with hundreds of other observers I have seen Sparrows

causing heavy losses in oat and wheat fields, pulling elm and peach blossoms to pieces, and flocking into the horticulturists' precincts to feast upon cherries, grapes, raspberries, and other fruits. Like most of our common birds the Sparrow derives a part of its sustenance from the animal world. Prof. Barrows has shown that insects of several orders, representing dozens of families, and hundreds of species, have been eaten by the Sparrow. Insects that fly in a zigzag course are more liable to escape birds than those that fly straight away. During August, 1895, in Washington, I have seen on several occasions a Sparrow pursue, capture, and eat piecemeal a cicada, which is a swift insect that takes a beeline course. On the other hand it is only after many unsuccessful attempts that a moth or flying grasshopper is caught in its hither and thither course. Common flies and wasps dodge an enemy. The same is true of the dragonfly (*Libellula*). I remember seeing a Sparrow dart from above and then from below, and then flutter up at one of these insects on the 'College yard' in Cambridge. Finally, after five minutes of fruitless attempts, the Sparrow, more by chance than skill, struck the dodging insect which fell disabled to the ground.

The Washington Sparrow finds it more profitable to breakfast on the insects that have been killed or disabled by electric lights. In the early morning during April and May he comes to the lamps to eat May beetles, and small predaceous ground beetles (Carabidæ). The entomologist, who visits the lamps after the Sparrows, finds only the hard wing covers (elytra) of the beetle he had hoped to collect. In spite of the insectivorous habits the Sparrow is branded a nuisance, because he pillages crops, disfigures buildings, and disturbs the peace by his never flagging, monotonous chirp.

Prof. Barrows, beside exposing the true character of the English Sparrow, has also dealt with the Crow in an economic manner. On page 22 of Bull. 6, U. S. Department of Agriculture, he describes a 'roost' at Arlington, Va., where every winter night over 100,000 Crows sleep. About their lodgings were found pellets which had been disgorged. These pellets consisted of seeds held together by sand. The most common of these seeds were,—dogwood, sour-gum, smilax, red-cedar, poison ivy, poison sumach,

and harmless sumach. The Crow takes a large proportion of corn during the winter, and may often be seen in large flocks visiting corn stacks. The quantity of insects eaten during the winter is small, for the Crow during the cold weather subsists principally upon vegetable matter.

Being anxious to learn how Crows glean a living when the ground is snow-covered, I went to Arlington, Va., on the 15th of last December. A flock of fifteen Crows was on the ground at the edge of the wood on the south side of a hill, where the snow had melted enough to leave bare spots as large as saucers. The dusky fellows were busily overturning leaves, and picking up something. They arose as I came quite near, and the several that cawed were Common Crows (*Corvus americanus*). The ground where the birds had been looked as though it had been raked. Beside turning over the leaves, the Crows had picked into the earth. Upon turning over some leaves that had not been disturbed, I found berries of dogwood and sour-gum, and living insects. The berries at this time of year do not hang on the trees. Although no insects were found where the Crows had searched, under several leaves that had not been disturbed I found several spiders (*Drossus*), leaf-hoppers (*Proconia*), ants (*Camponotus malleus*), a ladybird (*Coccinella 9-punctata*), a harlequin cabbage bug (*Murgantia histrionica*), and several smaller bugs. If the Crow were less wary it would be much easier to learn how it obtains insect food in winter. This same day I saw dozens of Crows in red cedar trees feeding upon the berries.

On March 15 I had another opportunity of seeing how Crows find food when the ground is covered with snow. On the southern side of the Washington 'Zoo,' which is a picturesque depression among rugged hills, was a field with several snow capped manure heaps which the crows had been making tracks about. In many places the snow, which was two inches deep, had been brushed away, and a shallow excavation dug in the frozen manure. Here apparently the only food was a large number of plump oat seeds which were filled with a soft white mass. I hope next winter to watch Crows at meal times when the ground is covered with a foot or more of snow.

There is much to be done in the study of the feeding habits

of our commonest birds. Every one knows in general what birds eat during the winter, but few can tell you whether the Junco takes any insects on the warmer days of January or not, or just what the Chickadee is eating when he hangs head downward from a lichen-grayed branch. We need more observers who go out with the spirit of the writer of 'The Brown Thrush in Eastern Massachusetts.'

SUMMER BIRDS OF NORTHERN ELK COUNTY, PA.

BY WILLIAM L. BAILY.

PUBLISHED lists of the summer birds of Elk, McKean, and Potter Counties, Pa., are so limited¹, it is hoped that the following report may be of some aid for comparison in our recent efforts to establish more accurately the breeding ranges of the birds of Pennsylvania, which must be based principally upon a series of careful lists and notes taken during the breeding season in localities scattered all over the State.

Few of us seem to have had the opportunity of visiting, for any length of time, these counties, and although two weeks was the limit of my stay, from the 18th of June to the 2d of July, 1894, I was enabled, on account of fair weather, to give almost my entire time to field work, so that my list ought to be fairly representative. John Reese was with me on most of my trips and proved a most useful guide and companion.

The table-land which spreads over a large portion of north-western Pennsylvania, and especially that of McKean, Elk, and Potter Counties, is on an average almost as high as the crests of the mountains running diagonally across the State, the great topographical difference being that the table-land, which is separated from the mountains principally by the west branch of the

¹ "List of Birds observed near Bradford [McKean Co., Pa.]" by James A. Teulon, Quarterly Journal Boston Zoölogical Soc., 1883, p. 47.

Susquehanna, is generally flat, depressed by streams winding through it, not as a rule over 600 feet deep, while in the Appalachian system the valleys are rolling and the mountains rise in peaks and ridges high above them. Hence we find the fields, pastures, and orchards occupying the lowlands in the mountainous district, while in the northwestern part of the State they are on the high ground almost on a level with the ridges of the Appalachian Mountains. Such a marked difference in the contour of the two localities in question is sufficient for considerable faunal variation.

As to temperature, the severe weather continues so late in the spring that frost occurs sometimes well into May, and in 1894, on the first of June, the apple crop was so nipped that it was rendered practically useless. This condition is unfavorable to the advancement of many of the southern birds, which, however, venture far up into the mountains.

On the northern border of Elk County, about 2,200 feet above sea level, one of the highest points of the table-lands west of the Alleghanies, yet among fields, orchards, and pasture-land, is the enviable home of Captain A. G. Clay, from early May to the end of November, and in his hunting years, not many snows ago, his fires were kept burning far into the winter months as well. In this very vicinity the Wild Pigeon (*Ectopistes migratorius*) bred for the last time in any great numbers, and only a scattered few, to the Captain's knowledge, have been observed during the past thirteen years.

Twenty years ago the hunting in Elk County was worth speaking of, but railroads for the purpose of developing the oil, coal, and lumber are multiplying every year and the great hemlocks are fast disappearing, though not materially on the Captain's land of several square miles.

Within one hundred yards of his house is a pond not 200 feet long, the only one in the locality, and during migrations nearly every eastern species of Duck that flies overland, besides a variety of Gulls, Herons, Rail and Snipe, drop to rest and feed on this pond. The Captain gave me a list of 74, mainly game birds, most of which he has taken on or near this pond.

'Upland,' the name of Captain Clay's property, adjoins the McKean County line within half a mile of his house, and only a

few hundred feet beyond is Williamsville, about 550 feet lower in altitude and at the junction of Five and Seven Mile Runs, tributaries of the east branch of the Clarion River. I covered most of the high ground for a mile or two around the house, and made numerous trips on Five and Seven Mile Runs, on the east branch of the Clarion into McKean County, up Straight Creek four miles to the southeast, and on Rocky Run, a feeder of the west branch of the Clarion, five miles to the southwest, not far from Wilcox. At least two-thirds of the high ground was cleared and largely cultivated, just the place for Larks, Savanna, and Grass Finches. The Catbird, Indigo Bunting, Chewink, Chestnut-sided Warbler, and their friends occupy the brush and raspberry patches on the edge of the woods; and the Kingbirds, Goldfinches, and Cedarbirds abound in the apple orchards, which are adjuncts of every farm.

Most of the streams rising on high ground descend gradually into sheltered wooded ravines, Straight Creek being especially darkened by tall hemlocks, beech and maples, making it one of the coldest and most beautiful streams in the neighborhood. Here the Winter Wren, Solitary Vireo, Blackburnian and Canada Warblers, Water Thrush, Hermit Thrush and other typical Canadian species were most numerous.

But one swamp was met with, at about 2,000 feet; there the Red-wings, Woodcocks, and Song Sparrows revelled, and where it extended into the woods, Warblers and Woodpeckers were common. Here also were found the Saw-whet Owls. There seems to have been quite a migration between July 25 and 27, a Field Plover, Summer Yellow-legs, and a Green Heron being taken by John Reese between these dates. A Spotted Sandpiper and a few Woodcocks were the only breeding water birds that came under our notice.

With regard to the trees, the hemlocks in their primæval state are still plentiful, and, when they are in great numbers, harbor many a cool spot, almost entirely excluding the sun, and must afford considerable encouragement to the Canadian element. Sugar maples, black and white birch are very common; there are only a few white pines here and there, but beeches are abundant, serving in days gone by as the principal food of the Wild Pigeon, the young being fed almost entirely on the curd of the beech-nut.

The avifauna of Elk and McKean Counties seems to have a decided touch of the Canadian element, judging not simply from the occurrence of certain northern types, but on account of the number of the birds of each species, the first eight of the following list being abundant; *Junco hyemalis*, *Dendroica cærulescens*, *Dendroica maculosa*, *Dendroica blackburniæ*, *Seiurus noveboracensis*, *Troglodytes hiemalis*, *Turdus aonalaschkæ pallasii*, *Sylvania canadensis*, *Virco solitarius*, *Certhia familiaris americana*.

All but the first and last of the following ten were, I think, generally more common than they are in the Alleghanies: *Nyctale acadica*, *Sphyrapicus varius*, *Empidonax minimus*, *Carpodacus purpureus*, *Ammodramus sandwichensis savanna*, *Habia ludoviciana*, *Dendroica pensylvanica*, *Dendroica virens*, *Parus atricapillus*, *Turdus fuscescens*.

Another feature in support of my remark, was the apparent absence of all of the typical Carolinian, and more southern species, many of which are occasional or common in the Alleghanies, such as Dove, Quail, Acadian Flycatcher, Orchard and Baltimore Orioles, Cardinal, Louisiana Water-Thrush, Chat, Black-capped Titmouse, Brown Thrasher, Carolina Wren and others.

I should not omit to note as an additional Canadian element the common occurrence of *Limenitis arthemis*, a butterfly more common in the Adirondacks of New York.

As the title of this paper indicates, I shall only include in the appended list the birds which came under my personal observation unless especially noted otherwise. Following is the complete list:

(One *Ardea virescens*, the Green Heron, was taken July 25 by John Reese and may have been migrating. There were very few suitable places for Herons.)

1. *Philohela minor*. WOODCOCK.—Several in an open grass swamp close to the road; were said to have been plentiful several years ago.

2. *Actitis macularia*. SPOTTED SANDPIPER.—One on July 8 taken by John Reese on Seven Mile Run; identified.

3. *Bonasa umbellus*. RUFFED GROUSE.—One cock, and June 30, a hen with her brood were seen. Grouse are getting fewer every year.

(Wild Turkeys, I was informed, had not been seen since 1891, when one or two were taken in the fall. Quail have been taken but are very rare. The Wild Pigeon has not been seen since 1882, except one or two

at a time. Elk, McKean, Forrest, and Potter Counties are noted for their beech trees and no doubt there was no place in Pennsylvania where the Wild Pigeon bred in greater numbers.)

4. *Accipiter cooperi*. COOPER'S HAWK.—Only one was seen.

5. *Buteo borealis*. RED-TAILED HAWK.—Several; one nest in a large black birch about 70 feet from the ground.

6. *Falco sparverius*. SPARROW HAWK.—One seen June 19.

7. *Syrnium nebulosum*. BARRED OWL.—One taken July 9 by John Reese; specimen identified.

8. *Nyctala acadica*. SAW-WHET OWL.—There are very few breeding records in Pennsylvania of this bird. Two were taken, both in the young 'Kirtland' plumage, one June 28, roosting about 18 inches above the ground in a small hemlock in a rather open swamp. The other was taken a week or so later in the same locality.

9. *Bubo virginianus*. GREAT HORNED OWL.—Five, in a secluded spot on Straight Creek, young and old together.

10. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.—One only seen, close to the road on the edge of the hemlocks.

11. *Ceryle alcyon*. KINGFISHER.—One on the Clarion, and several on Straight Creek.

12. *Dryobates villosus*. HAIRY WOODPECKER.—Common; especially in the tall open wood where the hemlocks had been cut off. There is plenty of food and shelter for the Woodpeckers in the abundance of dead stumps, both standing and lying on the ground.

13. *Dryobates pubescens*. DOWNY WOODPECKER.—Common.

14. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.—Fairly common; several were taken, generally in open woods among the fallen logs, and close to the streams.

15. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—Several seen in same woods with the Yellow-bellied on the Clarion, and in one or two other places.

16. *Colaptes auratus*. FLICKER.—Common.

17. *Chætura pelagica*. CHIMNEY SWIFT.—Common; said to build in barns on rafters, and roost in trees in this locality during migration.

18. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.—Common around houses and in the deep woods (reported to have been seen, fifty at a time, when the orchards are in bloom).

19. *Tyrannus tyrannus*. KINGBIRD.—Common as I ever saw it anywhere, in the orchards and along the roads.

20. *Sayornis phœbe*. PHŒBE.—Common; especially around the house.

21. *Contopus virens*. WOOD PEWEE.—Common in open woods stripped of the hemlocks.

22. *Empidonax minimus*. LEAST FLYCATCHER.—Very common among birch, maple, and beech. Three nests were found, varying considerably in their construction and position, and a female was so tame

that I stood talking within eighteen inches of the bird on the nest for fully five minutes.

23. *Otocoris alpestris praticola*.—PRAIRIE HORNED LARK.—A very common, almost abundant breeder. Seen along roads and fences and ploughed fields.

24. *Cyanocitta cristata*. BLUE JAY.—Common; principally on the edges of the woods or in open timber.

25. *Corvus americanus*. CROW.—Only a few pairs were seen, partly, perhaps, on account of the scarcity of grain.

(*Dolichonyx oryzivorus*, the Bobolink, was seen by John Reese July 17, and one or two were taken a few days later, probably migrating.)

26. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.—Common; several were found near the pond breeding.

27. *Sturnella magna*. MEADOWLARK.—Noticeably less numerous than in the east.

28. *Quiscalus quiscula æneus*. BRONZED GRACKLE.—Common, but not in large numbers; several nests in tall pines in front of Captain's house; flocking about June 30.

29. *Carpodacus purpureus*. PURPLE FINCH.—Several males, singing in low maples, especially on edge of woods, and one, showing anxious discontent, caused me to waste considerable time vainly looking for his nest.

30. *Spinus tristis*. GOLDFINCH.—Common; several nests found, in all cases close to civilization.

31. *Poocætes gramineus*. GRASS FINCH.—Abundant; found at least six nests in open, dry fields.

32. *Ammodramus sandwichensis savanna*. SAVANNA SPARROW.—Abundant in the fields near barns. I hunted many times in vain for their nests.

33. *Ammodramus savannarum passerinus*. GRASSHOPPER SPARROW.—Observed in two different fields, about two miles apart, near farm houses.

34. *Spizella socialis*. CHIPPING SPARROW.—Abundant; a number of nests found; some in orchard trees and three were found in one thorn tree with two Kingbirds' nests.

35. *Spizella pusilla*. FIELD SPARROW.—Common; several nests, generally about three feet from ground, in raspberry bushes.

36. *Junco hyemalis*. SNOWBIRD.—Very common in the open woods, but more generally on the edge of the woods. A number of nests were found, all on low road-side banks, three to five feet high, in the moss or beside a root.

37. *Melospiza fasciata*. SONG SPARROW.—Abundant; five or six nests, both on ground and in bushes.

38. *Pipilo erythrophthalmus*. CHEWINK.—Common only in a few spots where several pairs seemed to associate in large open clearings covered with a tangle of underbrush and brambles.

39. *Habia ludoviciana*. ROSE-BREASTED GROSBEAK.—Rather common; several pairs seen in tree-cleared places where there were plenty of tangles and a small maple now and then to perch upon.

40. *Passerina cyanea*. INDIGO BUNTING.—Very few were noted, not more than three during the whole two weeks.

41. *Piranga erythromelas*. SCARLET TANAGER.—Several single birds and one pair in tall maple and beech grove. Not seen among the hemlocks.

42. *Chelidon erythrogastra*. BARN SWALLOW.—The only Swallow seen; common around houses, six nests under outside eaves of the Captain's house, scattered, however, and not in colonies as the Eave Swallows build. A singular fact came to note, viz.: A female was found dead on her nest resting in a most natural position and was probably frozen during the frost on the 1st of June. The skin was dry and hard.

(One *Petrochelidon lunifrons*, Cliff Swallow, was taken by John Reese August 3; specimen identified; possibly a migrant. Breeds in Columbia County.—R. Kester.)

43. *Ampelis cedrorum*. CEDAR BIRD.—Abundant; several nests all built unusually low; one, one and one-half inches in diameter, built of beard moss (*Usnea*), was five feet high in a birch.

44. *Vireo olivaceus*. RED-EYED VIREO.—Abundant; singing in the woods everywhere except in the primæval hemlock, where the woods are very quiet.

45. *Vireo solitarius*. SOLITARY VIREO.—One pair with young just out of nest, on the edge of the deep hemlock at the mouth of Straight Creek. Found abundant by Dr. Dwight on North Mountain (Auk, IX, 1892, p. 138), and I should have expected it to be more common here.

46. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Uncommon; only two or three were seen in second growth of hemlock, maple, etc. From several records it appears that the bird is common or abundant in the second hemlock growth of the Alleghanies (Stone, Dwight, and Todd).

47. *Compsothlypis americana*. PARULA WARBLER.—One female with one young bird, seen among small trees on a stream.

48. *Dendroica æstiva*. SUMMER WARBLER.—Several seen; one pair building in the orchard. This bird does not seem to venture much into the woods.

49. *Dendroica cærulescens*. BLACK-THROATED BLUE WARBLER.—Common in the woods where hemlock had been cut, as well as on the edges of the deep hemlock woods. It was very evident that the females were keeping close to their nests, as a great many males were seen, always singing, as if to assure their better halves that they were near at hand. The same could be said of the next four varieties, only one female being seen to ten males.

50. *Dendroica maculosa*. MAGNOLIA WARBLER.—Common; more so if anything than the preceeding. One nest was found in a tiny wild

cherry, about 3 feet high, at the side of a log road in a deep wood of birch, maple, and oaks, and some second growth hemlocks. The female sat so close that I touched the tree before she flew. This little bird, as it covered an almost invisible nest of hairlike grass, was one of the prettiest pictures in my experience.

51. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—Common; more females of this species were seen than either of the preceding two, but nearly always in overgrown, open places.

52. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER.—Common; principally high up in the hemlocks near the streams; only one female noted. The males were almost invariably singing.

53. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Common; generally in the same environment as the last species.

54. *Seiurus aurocapillus*. OVENBIRD.—Common in the dry upper woods.

55. *Seiurus noveboracensis*. WATER-THRUSH.—Common; especially on the clear streams not poisoned by the chemical works or tanneries, where only one was observed. One nest with eggs under the root of a tree, and a number of just fledged birds were seen. This bird begins to get common just west of the Alleghanies.

56. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—Common in its usual haunts.

57. *Sylvania canadensis*. CANADIAN WARBLER.—Common; singing constantly; seen less among the hemlocks than elsewhere, except on Straight Creek.

58. *Setophaga ruticilla*. REDSTART.—Only one was seen, this on the Clarion, and it was not observed in the mountains by either Messrs. Dwight, Stone, or Todd, but Warren speaks of it as being most common in the higher mountain regions, mentioning especially McKean, Potter, Sullivan, Centre, Blair, Lycoming, Crawford and Erie Counties. I found it common and several nests in very open places at Point Pelee, on the warm, flat Canadian shore of Lake Erie where the Summer Warbler, Baltimore Oriole, Brown Thrasher, and five Swallows, were abundant, a much more mild environment.

59. *Galeoscoptes carolinensis*. CATBIRD.—Very common, a number of nests being found. There happens to be a number of places on the southeastern slopes of some of the rolls, covered with raspberry bushes, well adapted for some of the more southern varieties, but few of them seem to take advantage of the fact.

60. *Troglodytes ædon*. HOUSE WREN.—Common in cleared woods as well as around houses.

61. *Troglodytes hiemalis*. WINTER WREN.—Abundant in the tall open woods as well as in the cool hemlocks near the streams; most common on Straight Creek, which is by far the coolest in the locality.

62. *Certhia familiaris americana*. BROWN CREEPER.—Not common; only about three seen, which were very hard to locate, and it may be

that we missed others, as they should be common here if anywhere. I found a nest at Eaglesmere, Sullivan County, Pa., in 1890.

63. *Sitta carolinensis*. WHITE-BELLIED NUTHATCH.—A few pairs, one near the house.

64. *Parus atricapillus*. BLACK-CAPPED CHICKADEE.—Abundant in all kinds of open woods and in trees along the road.

65. *Turdus mustelinus*. WOOD THRUSH.—Not seen at all the first few days where the Hermit was abundant. One was taken on Straight Creek, apparently very much out of place, where the wood was quite dense and damp. A few others were seen.

66. *Turdus fuscescens*. WILSON'S THRUSH.—Only one on the hillside above Straight Creek, acting very much as though a nest was near.

67. *Turdus aonalaschkæ pallasii*. HERMIT THRUSH.—Abundant; four or five nests, three on mossy banks at the side of the road; two I discovered from a wagon.

68. *Merula migratoria*. ROBIN.—Very common all over the open upland and near the clearings in the valleys.

69. *Sialia sialis*. BLUEBIRD.—Common around the farms.

SUMMER BIRDS (JULY 15–AUG. 13, 1894) OF THE RHINE.¹

BY RALPH HOFFMANN.

THE interest and pleasure which most naturalists experience in making field observations is often a reward for their somewhat tedious labors in other branches of the science to which they may devote their time. Especially when one is so fortunate as to carry his opera-glass into fresh woods and pastures new, the increased interest and heightened pleasure amply repay him for the discomforts of the journey. To me, in my capacity of amateur ornithologist, there has come a rather large share of these lighter labors, so that my slight connection with ornithology has proved, in a way, to be all play and no work. I hoped, therefore, when I looked forward last spring to a summer in Germany, to note down something which might be of interest to the members of the

¹ Read before the Nuttall Ornith. Club, Cambridge, Mass., Dec., 1894.

Club, and as I look back now to the excitement and delight which accompanied the study of so many new birds, I trust that I can share these pleasures in some degree with those whose recitals of labors in other fields have so often interested me.

In order to give a degree of coherence to the notes which I have to present, I shall try to group them about the stream which most travellers ascend for other study than that of its fauna, but first I shall sketch briefly the characteristics of twelve or fifteen birds which formed the staple diet, the daily food, so to speak, of my field observations. These sketches are slight, as I have made very little attempt to supplement my own notes by consulting the books; I hope, however, they will add a little color to the subsequent pages.

Blackbird (*Turdus merula*).

When Bottom sings in the enchanted wood,

“The ouzel-cock so black of hue
With orange-tawny bill,
The throstle with his note so true,
The wren with little quill,”

he enumerates the familiar songsters of England, and heads his list with the Blackbird. From the time of Shakspeare the Blackbird, the Wren, and the Redbreast are the familiar birds of English literature, so that with the exception of the Lark, the Nightingale and the Cuckoo, there were no birds I was more anxious to see.

July, however, is an even more inauspicious month in Europe than here; so many of the birds are early breeders. The Cuckoo and the Nightingale were silent, and to me invisible, and still remain mere names. With the Blackbird or Black Thrush, as the Germans call him, I was more fortunate. He was, if not so numerous as our Robin, quite as ubiquitous, whistling from the gardens and parks of the cities, and from the hillsides and glens of the country. His length is the same as that of his cousin, our Robin, and he suggests this bird in many ways. He has the same way of running forward, and then drawing himself up, and he plants his feet and pulls at an angle-worm in precisely the same way. He scratches more in the leaves than our bird, showing in this his

turdine affinities, and he has the Hermit Thrush's trick of raising his tail sharply after alighting. The young have brown backs and reddish streaked breasts, so that they suggest the Robin still more strongly.

The Blackbird's song is bright and invigorating; I heard it more from single birds than from choruses. Sometimes as the singer sat on the spray of some tree on the hillsides, the disconnected and vigorous phrasing suggested the song of the Brown Thrasher. The nest is placed in bushes instead of in trees, and the bird is more truly resident in Germany than the Robin is in Massachusetts, the northern birds joining their brethren of Central Europe for the winter.

Black Redstart (*Ruticilla titys*).

One of the most characteristic and familiar birds of Germany is the Redstart, a bird related, not to its American namesake, which it resembles very slightly, but to our Bluebird. In the domestic economy of German Nature, it seems to take the place of the Bridge Pewee (*Sayornis phoebe*). In Germany I found the Black Redstart by far more common than the Black-throated, the commoner British species, though I saw the latter not infrequently. It may be of interest to hear, on the authority of Mr. Saunders, that the male acquires his black breast by the wearing off of the gray tips to his feathers, as in the case of the Bobolink.

The Redstart haunts gardens and yards, flying constantly to the garden walls or house roofs, where it bobs at intervals like a Winter Wren. Its food consists of insects, which it pursues on the wing with considerable dexterity.

The Redstart arrives and breeds early and I failed to hear the song, which to the German villagers heralds the advent of spring.

A nest of this bird was shown me, on a shelf over some cellar stairs. To reach it the bird had to fly from the garden through the back door, which the occupants of the house kept open for it.

The German name, 'Rothschwänzchen', or Red-tail, corresponds to the English, Redstart, from the A. S. *steort*, a tail.

Redbreast (*Erithacus rubecula*).

This bird, so endeared to the British heart, rears his brood in clearings and in thickets; he is retiring rather than shy, and several that I saw were in yards and about dwellings, to which, as is well known, the bird resorts in winter for crumbs and broken meat. In a garden in Heidelberg I saw one frequently, hopping about among the tables disputing with Chaffinches for the fallen crumbs.

The Red-breast keeps to the ground much more than his relatives, the Redstarts, but like them he has a trick of flirting his tail and courtesying when observed.

The Tits (*Parus*).

Europe is fortunate in the abundance of these cheerful and familiar birds. We are thankful all winter for our Chickadee, but in Germany, I was assured, it was no uncommon sight to see, in winter, four species, all picking at the same bone or candle, suspended for their use. I found six species in all, four of which were generally distributed and common.

The commonest was the Blue Tit (*P. cæruleus*), a charming and lovable bird, richly colored and active as a squirrel. I found an apple tree on one occasion, which was, so to speak, infested with Blue Tits; they hung to the smaller twigs, pecked at the leaves, and gleaned along the branches.

Two other species, which are often associated, are the Coal Tit (*P. ater*), and the Swamp Tit (*P. palustris*). These two and the Blue Tit, are smaller than our Chickadee, hardly larger in fact than Kinglets. In winter they are everywhere, but in summer the Coal Tit seems to prefer coniferous woods. These species are nimble and noisy, prying out insects from the bark, hammering open seeds, and conveying through the woods flocks of Kinglets, Creepers and other birds.

The longest and most sedate of the family is the Great Titmouse (*Parus major*), half an inch larger than our Chickadee. All four of these species are loquacious and their notes are numerous.

Many of them suggest the Chickadee, especially his *tee, dee dee*, and the *turre day* notes, but I heard nothing resembling his song.

Wren (*Troglodytes parvulus*).

In hedges and thickets, in fact in just such situations as a Winter Wren would choose on migration, skulks the Hedge-king, as the Germans call him. The Wren is a resident species; he was still singing freely in August, and I found the song hardly distinguishable from that of our Winter Wren.

White Wagtail (*Motacilla alba*).

This is one of the most characteristic birds of Germany, and I suppose, of the Continent generally, and in England a closely allied form is a conspicuous member of the avi-fauna. In the fields, especially when ploughed, in the meadows and in the village streets, this bird walks daintily about, or takes a short quick run after his insect prey, his long tail nicely balanced and constantly oscillating. He flies often to the ridge-poles of houses, tops of posts or other conspicuous positions, and one whom I found on the Drachenfels, flew to the very top of the ruined tower. Nesting is early with the Wagtail, and in July the young were following the parent birds about the streets, eager for food. The period of song is said to be very short, and I heard nothing but a few call or alarm notes.

The Wagtails were flocking in August, but they remain in considerable numbers throughout the winter.

Swallow (*Hirundo rustica*).

For any readers of Gilbert White no European birds possess more interest than the Hirundinidæ, a term which, in his day, included the Swift. No suspicion crossed the good rector's mind that, one day, the Hummingbirds would wage on the Swallow family fierce osteological war for the possession of this bird.

The Swallow was one of the first land birds that I saw in Europe, and I hardly ever lost sight of him and his kindred. The call note, the low song, often given from the ridgepole, and

the marvelous dexterity of the Swallow proper, the Country Swallow, to translate his Latin name, reminded me at every turn of the Barn Swallows, which I had left behind me. The specific name is, however, somewhat misleading, for the Swallows haunt not only the grassy meadows, but the smaller towns as well, where they are conspicuous in all the paved streets. They beat the squares and gutters as regularly as a Marsh Hawk does a meadow, flying up and down, sometimes hardly a foot above the stones, turning the corners and coming down the other side, in and out among the people and off at last to the nest. Swallows breed in any sheltered corner, often in chimneys, whence the German name, Smoke Swallow. I observed one passing to her nest through a hole in a shed door.

They linger till September or October, and gather in great flocks utilizing the telegraph wires, as with us, till a favorable night for their departure. Their return in April has long been connected in proverb and song with the approach of warmer days.

Martin (*Hirundo urbica*).

This is a characteristic bird of the towns wherever the eaves of buildings, preferably of stone, offer him a covering for his cupshaped nest. I found them also in the mountains, where there was too little grass-land for the Swallow. The Martin is gregarious, and the hotels fronting on the Rhine were often tenanted by colonies of one or two dozen. The birds avoided the street, however, and hawked over the river, where their glossy backs and white rumps flashed in and out among the plain brown backs of their cousins, the Bank Swallows. Their note is a single rough monosyllable, *spritz*, suggesting that of the Cliff Swallow. They were still feeding young in the nest, August 8, evidently the second brood.

Chaffinch (*Fringilla cœlebs*).

This handsome and confiding bird was as characteristic of the village street as either the Wagtail or the Redstart, and was also common in every bit of woodland. The parks and groves resounded, in early July, with his cheerful and vigorous song,

resembling, to a considerable degree, that of the Purple Finch, though perhaps a trifle stronger. In the streets and in the roads the Chaffinch picked up seeds, insects, or fallen refuse.

In an open air restaurant at Heidelberg, I amused myself by throwing crumbs to the Chaffinches, who approached often to within a foot or two of my chair, but their bread was often snatched from their mouths by the more vigorous, if less welcome Sparrows.

At evening the parks or open spaces in the cities resounded with the call notes of this bird, *finck, finck*, and a peculiar *skree, skree*. From their call note comes their German name, 'Finke', and the English, Finch.

They are resident, and for part of the winter the males separate from the females.

Yellow-hammer (*Emberiza citrinella*).

This is a bird of the fields and hillsides, especially in the neighborhood of farms. He feeds on insects and in winter on seeds. He is not shy, and not as restless as the Chaffinch. The Yellow-hammer was perhaps the freest singer in July, and was still singing in August; in fact he reminded me of the Indigo-bird in his fondness for hot exposed situations, railroad embankments and even telegraph wires. Everywhere his deliberate song rose at regular intervals through the quivering air. The song is not loud but carries a surprising distance, and has something of the Grasshopper Sparrow's quality. It may be imitated by the syllables *zi, zi, zi drüh*.

The bird nests near the ground and raises two broods. He is a winter resident.

Skylark (*Alauda arvensis*).

The Lark and the Blackcap were still in full song in the middle of July, though both ceased singing in August. The grainfields of the Rhine and Neckar valleys stretched in what seemed to my New England eye a tremendous expanse of yellow waves. Among these, from morning till night, the Larks rose, sang and descended

to their little domains in the wheat. The descent is gradual till the bird nears the ground, when he darts with great speed into the cover. When feeding, the bird walks slowly, and nods his head at each step.

The Lark is one of the most numerous of European birds, but notwithstanding his two broods, that he withstands his thousand enemies is a mystery. His habit of nesting on the ground and in the cornfields exposes him to the attacks of many animals and to the mischance of an early harvest. During migration, which is accomplished in vast flocks, he suffers severe loss from netting, but holds his own and returns each March, at the first sign of spring, to his chosen field.

Swift (*Cypselus apus*).

The common Swift of Europe I found everywhere, from Holland to the interior of Germany, but especially abundant on the Rhine and in Nuremberg, where the fortress was besieged by a screeching multitude. The bird is an inch and a half longer than our species, and the presence of a well shaped tail, and the long recurved wings make him far more dexterous in the air. His flight is rapid, and he turns after his insect prey as swiftly as a Swallow.

The note is a curious screech, fine and rasping, resembling a bat's squeak. This the Swifts utter sharply, as they drive past in twos and threes, and sometimes, if they come close, the effect is startling.

The Royal Palace at Amsterdam was a favorite breeding place of the Swifts, who had built their rude nests of straw in the stone gargoyles, or in niches along the sides of the building, nor had their excrement added anything to the appearance of the somewhat unpretentious structure. In Nuremberg, the crevices in the ruined wall surrounding the fortress were full of nests, and at evening as I walked along the wall, the moat was full of screeching 'devillings' as the English call them. Their German name is 'Mauer Schwalbe' or Cliff Swallow.

By August the Swifts had almost entirely left their breeding places, and a few stragglers alone remained along the Rhine.

These then are the birds which on a summer day in Germany one cannot fail to see. How they are distributed, in what haunts, and in what numbers, how they and their rarer kindred enter into the pictures of Rhine scenery, I shall try to show by the following notes.

My time on the Rhine was divided between two points on the upper Rhine, Bonn and St. Goar, and a short trip along the sluggish waters of its lower course.

The first German soil that I trod, after I shook the dirt of Cologne off my shoes, was that of Bonn, where I spent Sunday and Monday, July 14 and 15. I was impatient to get into the fields, and taking a ferry Sunday morning, swung slowly across the stream, towards the opposite bank, where a low range of vineclad hills formed the outposts of the Siebengebirge. The familiar harsh note of the Bank Swallow, the *skreeing* of Swifts, and the cry of the Martins, which I heard here, proved the constant attendants of my journey along the river.

In the fields which lay along the opposite bank, my first Skylark flew to the ground almost at my feet, with a note which suggested that of the Shore Lark. A moment later I heard one singing overhead. The song reminded me in quality of a Bay-wing's (*Poocætes*), but the singer's height and the length of the performance made it fairly inspiring. A slight disappointment which I felt at first, soon wore off and the song grew to have a great charm for me, before the gathered harvests made the singer a silent gleaner among the stubble. In a neighboring furrow, I made another acquaintance, destined to be an almost inseparable companion of my travels. This was a White Wagtail, who was picking his way over the upturned soil, walking with dainty steps, and balancing his long tail with a skill born of much practice.

The chaussée lay white and hot under the fierce sun, so I turned off past a gravel-pit, where Bank Swallows were breeding, to a little hill, the 'Finkenberg', formed, like the rest of the Rhine banks, of loose shingly stone, and covered with a sparse growth of small oaks. Here my scanty knowledge of European birds soon proved insufficient to identify the small restless creatures which eluded observation among the leaves, or to trace to their source the varied notes which issued from the thickets and

coverts. One songster in particular led me a long and fruitless chase, but I was more fortunate when I heard him again the next morning. At the foot of the hill, when I descended on the other side, I found a garden and orchard through which ran a brook. This seemed a favorable place for observation and so it proved to be. Several Flycatchers darted from their perches, to return with their booty; Brown Creepers climbed the trunks of the apple trees, whispering to each other as stridently as they do here in winter, and differing apparently from ours only in the lack of a trinomial name. They were convoyed too, as ours are, by Titmice, larger and handsomer than the Chickadee, but very similar in habits. On the garden walls or on the roofs of the houses sat Redstarts, fine bluish gray birds with brick red tails, which they snapped like Phœbes. From the vineyards and from the hill-sides came the fine, thin notes of the Yellow-hammer, and in the village on the river banks, Swallows flew close to the pavements, turning the sharp corners, and passing in and out among the people with surprising ease.

The nearest of the Siebengebirge to the Rhine is the famous Drachenfels, which in fact rises from its banks, and is crowned with the most interesting ruin of the lower Rhine. This I climbed the next day, and was rewarded by the beauty of the foot-way and by the charming prospect from the top. A little larch and spruce grew on the rocky summit and here I found my second Titmouse, of the half-dozen which I saw in Germany. This was the Swamp Tit, very like our Chickadee in color; he was holding a seed on a limb and opening it. Here, too, I heard again my elusive songster of the previous day. He was concealed in some shrubbery near the top of the crag, but his song was loud and wild and very fine; finally he came into view and proved to be the Blackcap, who among songbirds is rated very close to his cousin, the Nightingale.

Near the restaurant by which every interesting spot is crowned, or infested, according as the traveller's inclinations are prosaic or romantic, was a little yard where a bird was feeding, who at once attracted my attention by his fine colors and tame disposition. He was a Chaffinch, the characteristic bird of the streets and yards, sharing with the House Sparrow the society and sup-

port of man, but never, so far as I could find out, abusing his privileges. The Sparrow, I found, was disliked in Germany, almost as much as he is here.

On descending the hill I came to a little town on the banks of the Rhine, where I waited for the return of the boat to Bonn. The trees in the town gardens were gay with cherries and apricots, and here and there among them I heard the whistle of a Blackbird, for he as well as his American cousin, the Robin, likes to sheathe his gold dagger of a bill in a juicy cherry. The houses along the river were the resort of Eave Swallows, Martins as the English call them, corresponding curiously to our Cliff Swallows. Their cup shaped nests of mud lined the eaves, and the white rumps of the birds flashed in the sunlight, as they flew up to feed their hungry young.

At Coblenz, four hours above Bonn, the fortress of Ehrenbreitstein marks the beginning of the highlands of the Rhine, through which the swift stream has cut a winding course between rugged banks, cut in their turn by tributary brooks. In the midst of the most picturesque portion of these hills, on a narrow strip of land at their base, lies the town, or street more properly, of St. Goar, a single line of houses directly under the bank. On the hill above it stands a mighty ruin, Ruine Rheinfels. The opposite strand is occupied by another line of houses, and above and below this, stand two fine ruins, Katz and Maus. A mile or so farther up, the Lorelie-rock rises so precipitously from the river that the railroad has to pass under it through a tunnel. The hills are flat topped as if the whole surface had once formed a plain, now cut down for a second time in all directions.

In this charming town I spent July 18 and 19, and returning Aug. 11, spent another afternoon and morning on the hillsides and in the fields. The steep slope directly behind the town was almost entirely included in a large estate, through which I obtained permission to wander. The whole hillside was thickly wooded with a young growth of mixed timber, through which paths led in all directions. Here and there vistas had been cut, overlooking the swift stream below, or giving a distant view of the Ruine Katz on the opposite shore. This wood I visited twice and found in it each time a roving crew of small birds, constituted so like our

woodland bands that I almost expected to hear the lazy trill of a Pine Warbler from the American pines which had been planted there. There were Titmice, not only the two acquaintances I had made among the Siebengebirge, but three other species as well; the Coal Tit, also resembling our species; one individual of the strange Long-tailed Tit, his body smaller than a Kinglet's with a tail three-fifths as long again; and the charming little Blue Tit. This Tit was rarely quiet and hardly ever right side up. Side by side with the Tits worked a Nuthatch, very closely resembling our Canadian species, though nearly as large as *Sitta carolinensis*. In winter the company includes Kinglets, which breed, in Germany, in forests of spruce and fir. Instead of our Warblers and Vireos there were Wood Wrens and Willow Wrens, small birds related to the Kinglets. Chaffinches and a Flycatcher took the places of the Snowbirds and Phœbe, which might share our woodland with such a crew. Here and there in the wood were moist ledges where water dripped past nodding harebells into a small fishpond below; here I saw Redbreasts, shyer than I had expected, staring at me with large eyes which betrayed their kinship to Bluebird and Thrush.

In the afternoon, I took a little tug which puffed across the swift current and landed me under the shadow of the Ruine Katz. A path led up the rocky ridge to the entrance of the ruin. My former experience warned me that I should have the company of a guide, if I entered that way, so I took the liberty of climbing the hill behind the castle and scaling the wall which protected the rear. The great court in the centre of the ruin was overgrown with bushes and trees; ladders led half way up the round tower which I climbed, but startled no Owls from their ruined retreats. A pair of fine Falcons, as large as the Peregrine, swept past me later, and I was told that they bred on the tower. A Buteo was circling in the sky and later I saw a small Hawk, perhaps a Kestrel, hovering over the river. Leaving the ruin, I climbed back with some difficulty. The hill, or Rhine bank, rose for about a hundred feet above the spur on which the ruin stood. The poverty of the soil lent an Alpine character to the vegetation; the hill was bright with yellow sedums, pinks, various flowers of the gorse family, and the first purple blooms of the

heather. A gold-green lizard slipped into a bush, and climbed it as nimbly as a snake.

Here and there in a thorn bush, I found a Red-backed Shrike, or his plainer colored mate, and once the Great Gray Shrike slipped to a topmost spray, like our winter visitor. This is a rare bird in Germany, where he is persecuted for his murderous attacks on the smaller birds. From every side came the song of Yellow-hammers. Their lemon yellow heads, brown bodies, and white tail-feathers made them an easy mark for my opera glass.

The vineyards were the resort of numerous fringilline birds. The vines are planted on a steep succession of sloping banks, separated by stone walls, which keep back the avalanche of loose scaly stones, which threaten to engulf them. Here I found another rare bird, a Bunting, with white stripes on his ashy forehead; Linnets, too, with reddish cap; and Goldfinches, brilliant and restless birds, painted by the Creator, as the Germans tell their children, from the leavings of all the paint pots used during the creation.

It was with a feeling of surprise, when I had climbed the hillside, that I came on broad fields of grain, men and women reaping and binding, and Larks singing constantly overhead. The ascent was that of a mountain; the summit was a smiling plain. Here I was never out of the sound of Larks; scarcely had one shot down into the grain, when another began his *skree*, *skree*. I timed one, and found he sang for two and a half minutes. According to the books, however, it is not an unusual thing for one to remain in the air for a quarter of an hour. When I visited the same spot a month later, no Larks were singing, but here and there one flew from the stubble. Wagtails were numerous, particularly after the stubble had been turned over, and, in one field, a Pipit followed me for some distance with signs of distress. Crows, in voice and aspect hardly distinguishable from ours, also frequented these fields.

Here and there among the fields, or in the hollows between, clusters of trees had been left, and from among these the hoarse scream of the Jay startled me. It was some time before I discovered the author. Though so large a bird (he is five inches longer than the Blue Jay), he conceals himself with all the dex-

terity of a thief, which no doubt he is. Finally I got a good view of one,—the white rump, as he flew, the rich brown of the back, and the fine steel blue patch on the wing, so much in demand for artificial flies. In these groves, too, the Turtle Doves took refuge, when I frightened them from the grain fields. Their rounded tails are tipped with white, as in our species.

Beyond the grainfields, I often came to picturesque villages, the tiles of the houses slate-gray and the sides and ends covered with laths crossed in the plaster.

After walking for some time, through the fields, in the direction of the Lorelei-rock which overhung the Rhine on my right, I heard the sound of water below me to the left. I passed through a belt of pines and climbed down the loose, shingly side of a steep hill, crossed two broad chaussées and after a steep descent found myself in a narrow wooded valley. A noisy brook ran over the stones under arching trees, among which a Bulfinch showed for a moment. Wood oxalis grew in the damp moss, and ferns and brambles formed a dense tangle. I descended the valley, which broadened from time to time to a strip of meadow, and at last a house appeared with a sluice and a mill wheel. The sides of the valley were steep and clothed with pine. The brook and the neighboring road wound continually, sometimes passing directly under jutting rocks; now and then I came to gray-tiled houses, each with a wheel to which the noisy waters could be bound. The Rhine with its steamers and long lines of heavy barges, seemed far away and when I found that this little valley was the "Schweizer Thal," I thought the name most apposite.

Blackcaps sang in the willows, a Hedge Sparrow scratched under the bushes that lined the stream, and from far up on the hillside came the wild whistle of the Blackbird. When I revisited this mountain glen (for so it seemed) in August, I found two interesting birds which I had not seen on my former walk, but which no doubt were regular residents. One was the Mountain Wagtail, who was leading his young over wet stones which blocked the brook, and the other was a Water Ouzel or Dipper. This strange bird, a Thrush who yet dives, swims and lives on fish, was standing near a mill wheel, up to his reddish belly in the foaming water. When he saw me, he flew swiftly along the stream, and disappeared under the arch of a small bridge.

Soon the valley turned towards the river, the Blackcap's song and the Blackbird's whistle sounded more faintly from the mountain side, and Redstarts flew from the walls to the houses, which now became more numerous. As I paused a moment to look back, the last gleam of sunlight fell on the rugged outlines of the hills. I heard once more the Blackbird whistling far up the glen, and then, stepping out into St. Goarshausen, came upon the busy Rhine flowing by as swiftly as it did when Cæsar bridged it. High in air was a multitude of birds, which also circled there no doubt in Cæsar's time, great crescent-shaped Swifts, Martins and Swallows, and low over the river Bank Swallows uttering their harsh notes.

The Swifts and Swallows, as I have said before, are constant attendants of a Rhine journey in summer. From Mainz to Cologne they circled about the steamer, and at Arnheim, in Holland, where in August I took the boat for Rotterdam, I found them again. Above Bingen, before the river enters the Highlands, and at Coblenz where it escapes from them, there are broad expanses, where I was surprised to see not only Terns but Gulls, two hundred miles from the ocean; the Tern was our common species, and the Gull corresponded to our Bonaparte's. Herons, too, frequented these upper reaches, and from the low islands the steamer's wash drove Sandpipers, closely related to our Actitis.

Below Arnheim the river is more sluggish, and for some distance before it reaches Rotterdam, it attains considerable breadth. Great barges ascend it here, or pass by one of the numerous canals and branches, to the River Maas. The country was here very flat and fertile. The fields were full of sleek cattle, among whom, in July, Starlings innumerable had walked. Now they had all wandered off in one of those vast throngs which blacken the sky in Autumn. The Swifts too were very scarce, only now and then one showed his scimitar wings among the Swallows. Lapwings and Curlews fed in the fields, which were intersected by countless ditches. When the boat disturbed the Lapwings, they rose and with shrill cries and nervous flight, mounted upward, their white rumps and bellies contrasting with their glossy backs. Quite as conspicuous and with the same contrasting colors, were the occasional Magpies, which flew up from the banks, flirting

their handsome tails. The reedy shores of the river were the haunts, no doubt, of Ducks, two of which flew past us, and a Heron, gaunt and gray, gazed at the boat with uplifted leg.

As we approached Rotterdam, Terns and Gulls grew more numerous and Cormorants became a characteristic feature of the river. Whether sitting on the water, in Loon-like posture, or flying with outstretched necks athwart the sky, or perched in ungainly attitudes on the poles which rose from the narrow dikes, they were always conspicuous, and always ugly. The Gulls were the small black-headed species found before near Mainz, but near Rotterdam several Herring Gulls appeared. The red-tiled villages, too, became more frequent. The incessant hammering of shipyards assailed the ears. Boats with high and decorated prows driven by dark, patched sails passed the steamer. Soon the masts of countless shipping appeared before us and the steamer made fast to her wharf in Rotterdam, leaving the Rhine and its summer birds far behind.



THE CORMORANT ROOKERIES OF THE LOFOTEN ISLANDS.

BY R. W. SHUFELDT, M. D.

OUR distinguished Corresponding Member, Professor Robert Collett of the Zoölogical Museum of Christiania, Norway, has for the past year or more been attempting the photography of the breeding sites of various species of Norwegian birds. Some of his recent results are very beautiful indeed, and last July (1895) when he was visiting the Lofoten Islands off the coast of Norway, he succeeded in obtaining some particularly good pictures of the breeding places of the Cormorant (*Phalacrocorax carbo*). One of these he has very recently sent me, to use as I see fit, and, as this species breeds upon our own North Atlantic coasts, I must believe that the reproduction of Professor Collett's excellent photograph, illustrating the present paper, will be of interest to our



BREEDING CORMORANTS (*Phalacrocorax carbo*).

Borgevie Island, Lofoten Group, Norway.

own ornithologists. He writes me (11 Jan., 1896) that this view is of a rocky bay on the small island of Borgevæ of the Lofoten group, and that about three thousand Cormorant eggs are collected there annually, "and eaten by the fishermen; the eggs you see in the picture, was the *third* set laid this summer (all the other eggs already taken)." In the illustration are seen a number of the nests of the Cormorants in the foreground, containing from three to five eggs each; while in the distance nine or ten of the birds are in sight. Three or four of these are sitting on their eggs in the nests; others are perched on the rocks, and one is standing on the edge of its nest. Mr. Ridgway in his 'Manual of North American Birds' gives the clutch of eggs for the *Phalacrocoracidæ* as 2-5, and the size of those of *Ph. carbo* as 2.50×1.61 , being "elongate-ovate, pale bluish green, with a more or less continuous white chalky crust" (pp. 77, 78). The present writer has examined the eggs of this Cormorant in the collections of the U. S. National Museum, for which courtesy he is indebted to Major Bendire. The eggs of some species of Cormorants are wonderfully like those of the Western Grebe (*Aechmophorus occidentalis*), and not at all easily distinguished from them.

The Lofoten Islands are off the northwest coast of Norway between $67^{\circ} 30'$ and $69^{\circ} 20'$ N. lat., and between 12° and $16^{\circ} 35'$ E. long. It is a large group and noted for its picturesqueness, and the location given also includes the Vesteraalen. We are told that the "extreme length of the group from Andenæs, at the north of Andö, to Röst, is about 130 English miles; the aggregate area amounts to about 1560 square miles, supporting a permanent population of about 20,000. The islands, which are all of granite or metamorphic gneiss, are precipitous and lofty; the highest peaks are in the Lofoten group, Vaagekallan on Öst-Vaagö rising directly from the sea to a height of 3090 feet. The climate is not rigorous, and in summer the snow-line is at 3000 feet. There is no wood upon these islands."

In the 'Dictionary of Birds' Professor Newton says: "The Cormorant, *P. carbo*, frequents almost all the seacoast of Europe, and breeds in localities at various stations most generally on steep cliffs, but occasionally on rocky islands as well as on trees. The nest consists of a large mass of seaweed, and, with the

ground immediately surrounding it, generally looks as though bespattered with whitewash, from the excrement of the bird, which lives entirely on fish. The eggs, from four to six in number, are small, and have a thick, soft, calcareous shell, bluish-white when first laid, but soon becoming discolored. The young are hatched blind, and covered with an inky black skin. They remain for some time in the squab-condition, and are then highly esteemed for food by the northern islanders, their flesh being said to taste as well as a roasted hare's. Their first plumage is of a sombre brownish-black above, and more or less white beneath. They take two or three years to assume the fully adult dress, which is deep black, glossed above with bronze, and varied in the breeding-season with white on the cheeks and flanks, besides being adorned by filamentary feathers on the head, and further set off by a bright yellow gape. The old Cormorant looks as big as a goose, but is really much smaller; its flesh is quite uneatable." (Pt. I, p. 105, *Cormorant*.)

It will be noticed, that Mr. Ridgway says the Cormorants, speaking generally of the family, lay from *two* to *five* eggs, while Professor Newton in the above account says from *four* to *six*. When I printed my 'Comparative Oölogy of North American Birds,' I had apparently overlooked this discrepancy in the two authorities just quoted. In Professor Collett's photograph the clutches of the nests in sight are evidently three to five each, but the number in the set here may have been influenced by the birds having been so often interfered with, and their nests so frequently robbed.

CRITICAL REMARKS ON THE MEXICAN FORMS OF THE GENUS *CERTHIA*.

BY HARRY C. OBERHOLSER.

THAT there exist in Mexico two well defined races of the genus *Certhia* appears to have been first recognized by Count Hans von Berlepsch. He, in 1888, described¹ a new subspecies of the

¹ Auk V, 1888, 450.

genus from Ciudad, Durango, northwestern Mexico, under the name *Certhia mexicana albescens*; thus restricting *mexicana* proper to Guatemala and the more southern parts of Mexico. When, some years later, Mr. Gerritt S. Miller substituted¹ the name *Certhia familiaris alticola* for the preoccupied one of *Certhia familiaris mexicana* (Gloger), he very evidently overlooked the name proposed by Berlepsch, and bestowed the subspecific designation *alticola* upon "the *Certhia* inhabiting the mountains of Guatemala, Mexico and southern Arizona . . . (No. 726a of the A. O. U. Check-List)." Since the term *alticola* was intended to simply replace that of *mexicana*, and as it consequently may, with equal pertinence, apply to either of the Mexican forms, it seems best to retain it for the race to which Count von Berlepsch restricted the original appellation of the Mexican Creeper — *i.e.*, the bird occurring in southern Mexico and Guatemala.

The race inhabiting northwestern Mexico and Arizona will, therefore, stand as

Certhia familiaris albescens (Berlepsch).

Certhia mexicana GLOGER, "Handbuch, 1834, 381" (part).

Certhia familiaris var. *mexicana* BAIRD, BREWER & RIDGWAY, Hist. North Am. Birds, I, 1874, 128 (part).

Certhia familiaris alticola MILLER, Auk XII, April, 1895, 186 (part).

Certhia mexicana albescens BERLEPSCH, Auk V, October, 1888, 450.

CHARS. SUBSP.—*Certhia C. familiari americanæ similis, sed corpore superiore valde saturatiore, uropygio castaneo, nec fulvo, pectore abdomineque paulo canescentibus, nec pure albis, primo visu distinguenda.*

Al., 59-67 (63.8) mm.; caud., 55-64 (60.7) mm.; exp. culm., 13-15 (14.2) mm.; tars., 14-15 (14.2) mm.

HABITAT.—N. W. Mexico et Arizona.

DESCRIPTION.—Male, No. 56249, Am. Mus. Nat. Hist.; Napolera, Sonora, Mexico, Dec. 12, 1890; F. Robinette. General color above clove brown, the rump and upper tail-coverts chestnut. Superciliary stripe, spots and bars on wings, together with streaks on head, cervix and back, nearly pure white; these markings being on head rather narrow, much broader and somewhat confluent on hind neck and back. Interscapulum with a very slight admixture of the color of the rump. Outer webs of tail-feathers with little or no ochraceous suffusion. Chin and upper throat pure white

¹ Auk XII, 1895, 185.

crissum pale, tawny ochraceous, many of the feathers tipped with white; remainder of lower parts grayish white with, posteriorly, an almost inappreciable rusty tinge.

This subspecies may, by its much darker color above, be at once distinguished from any of the other forms of *Certhia* occurring in the United States, and requires comparison with only *C. familiaris alticola* from southern Mexico and Guatemala. From this it differs most tangibly in its much less rufescent tint above, the ground color of the plumage being clove brown instead of sepia; the streaks on head and back are much more clearly white and more sharply defined, and on the former somewhat larger. All the other light markings are more nearly pure white, usually lacking in a large degree the rufescent tinge seen in *alticola*. The lower parts are much lighter in color, being pure white anteriorly, and light grayish posteriorly, instead of dull rufescent gray with an admixture of rusty. The color of the rump apparently does not present a constant character, as some specimens from Arizona have this part fully as light as the Guatemala birds. The length of the bill, which was mentioned by Count von Berlepsch as diagnostic, cannot be relied upon to separate the two races, as may be seen by reference to the measurements given in the present paper.

Specimens of *albescens* from Chihuahua, Sonora, and Arizona are practically identical in coloration; but none from other localities have been examined.

Certhia familiaris alticola (Miller).

Certhia mexicana GLOGER, "Handbuch, 1834, 381" (part).

Certhia familiaris var. *mexicana* BAIRD, BREWER & RIDGWAY, Hist. North Am. Birds, I, 1874, 128 (part).

Certhia familiaris alticola MILLER, Auk XII, April, 1895, 186 (part).

CHARS. SUBSP.—*C. familiari albescenti affinis, sed capitis et nuchae striis angustioribus, corpore supra multo rufescentiori, subtus magis sordido, plus minusve ferrugineo tincto.*

Al., 58-67 (64.8) mm.; caud., 55-66 (61.2)¹ mm.; exp. culm. 12-16 (14.2) mm.; tars., 14-16 (14.7) mm.

¹Excludes five specimens which have the tail much worn or otherwise imperfect.

HABITAT.—Mexico merid. et centr.; Guatemala.

DESCRIPTION.—No. 69835, U. S. Nat. Mus.; Volcan de Fuego, Guatemala, Nov. 18-20, 1873, 10200-12000 feet; Osbert Salvin. Ground color of the upper parts dark sepia brown, the rump and upper tail-coverts very dark tawny. Superciliary stripe, streaks on pileum, cervix and interscapular region, bars and spots on wings, white, strongly suffused with rufous. The markings on head, hind neck, and back more indistinct than in *albescens*; those of the last mentioned portion somewhat confluent. Back with much infusion of tawny and chestnut; the outer webs of the tail-feathers with an edging of ochraceous. Chin and throat white, washed with ochraceous; crissum very pale tawny ochraceous, mixed with white; remainder of lower parts dull gray, suffused and somewhat mixed with rusty.

A much richer, more fulvous tinge characterizes this race as distinguished from the preceding. The light markings upon the head and cervix are somewhat reduced both in number and size, and together with those of the interscapular region are strongly suffused with the prevailing rufescent tinge of the remainder of the plumage, being thereby rendered noticeably less conspicuous. The ochraceous or rufescent tinge below is quite marked in comparison with typical *albescens*, though the amount of rusty admixture is decidedly variable. In some specimens, however, the throat is apparently without the ochraceous tint, being nearly as pure white as in *albescens*. The bird above described is perhaps an extreme specimen, as in all of the others the dorsal streaks are more grayish, often with a slight greenish tinge.

In its most typical form this subspecies inhabits Guatemala and southern Mexico, but the birds from central Mexico should apparently be also here referred. Specimens of *Certhia* from Vera Cruz, Puebla and southern Jalisco, though approaching *albescens* in the rather lighter color of the markings on the upper parts, are much darker below, and altogether are much nearer *alticola*.

The foregoing remarks have been based upon a series of eighteen specimens; five of the form here distinguished as *Certhia familiaris albescens*, and thirteen of *Certhia f. alticola*. Although more material would of course have been desirable, yet that which is now available seems sufficient to warrant the conclusions above reached.

Acknowledgment should be made to Mr. F. M. Chapman for his kindness in permitting the writer to examine the series of

Creepers contained in the American Museum of Natural History; to Dr. C. Hart Merriam for the use of the specimens in the collection of the Department of Agriculture; and to Mr. Robert Ridgway for his courtesy in allowing similar access to the collection of the National Museum.

FURTHER REMARKS ON THE LAW WHICH UNDER- LIES PROTECTIVE COLORATION.

BY ABBOTT H. THAYER.

SINCE writing my article on protective coloration in the April Auk (XIII, 1896, pp. 124-129), I have alighted on the means of still more complete ocular demonstration of the law of protective coloration.

I made some wooden eggs about the size of a Woodcock's body, and provided them with wire legs to poise them six inches above the ground.

Most of these I colored in imitation of the color-gradation of a grouse or hare; earth-color above, to pure white beneath; while to two others I gave a coat of earth-color all over, above and below; then set the whole like a flock of 'shore birds,' on the bare ground in a city lot.¹

I then summoned a naturalist and let him begin at forty or fifty yards to look for them. He saw immediately the two monochrome ones; but although told exactly where to look, failed to find any of the others, until within six or seven yards, and even then *only by knowing exactly where to look*.

I had also painted bright blue and red spots as big as a silver quarter of a dollar on the brown back of one of the graded eggs. These spots the naturalist saw, when we had come pretty near,

¹ To give the gradation its complete effect, the painting of the wooden eggs should be done after they are placed on the ground and of course by an artist.

though they only passed for details of the ground beyond the egg.

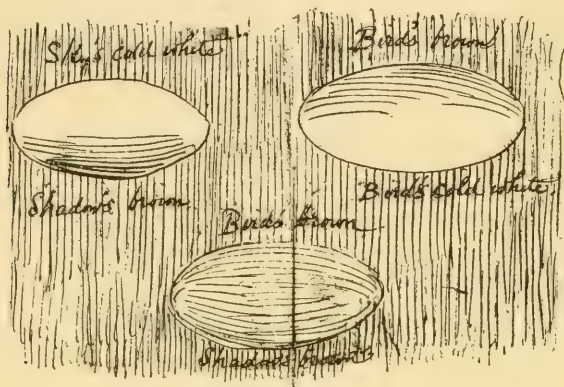
It was to this latter experiment that I alluded in a footnote (l. c., p. 127), when I said that brilliant top colors scarcely tend to interfere with the gradation's power. This statement does not apply, however, to creatures in which, as in a Blue Jay, the bright color so predominates as to form a silhouette shaped like the creature, but only when the bright pattern goes, as it were, its own way, not accompanying the animal's form.

Yet, even in the Jay's case, his gradation down to white under throat and belly diminishes so greatly his conspicuousness in the dim forest shade, that he may be suspected of great indebtedness to this arrangement of color as he skulks among the leaves. He must often be much helped, also, by the fact that whenever his gradation works its charm and denies his substantiality, his blue is *likely*, at least, to appear to belong to whatever surface, far or near, forms his background for the beholder's eye at the moment; as for instance a bit of blue distance seen through the leaves. And often when he is not concealed to this degree, his ghostly appearance still tends to cause the beholder to think him further off than he is, which may be sometimes equivalent to concealment. The reader should compare a graded blue egg with one blue all over, both seen in deep woods. Let me urge the reader to understand these color-phenomena, which are the open door into a new world of most charming study of special cases of protective coloration hitherto misunderstood.

One must remember that by far the greater part of the objects he espies as he walks are first caught sight of *out of the side of his eye*; and it is this *faint seeing* against which all this *faint appearing* is so potent, in countless cases where the animal could not elude the *direct eye*. In my former article I omitted to emphasize the device of nature by which she accomplishes, in the *only possible way*, the bringing the top, sides, throat, and belly of an animal to the exact *color* of the surrounding earth, as well as to the same *degree of darkness*.

The animal's top is brown like the ground about him, and from this brown his color grades steadily colder till it becomes *cold* white on his under surfaces. The latter being in shadow and

bathed in a yellow reflection from the earth, has the exact *color*, as well as *degree of darkness of his top*. Since, obviously, earth-brown bathed in sky light, equals sky light (color of the animal's belly) bathed in earth-yellow and shadow, *i. e.* brown.



This grading to white under-surfaces is precisely what would result if daylight tended to brown animals' coats, and its lack to bleach them. And, from this, one might fancy the whole phenomenon to be the result of such browning and bleaching. But to those who believe in Natural Selection it must be obvious that the gradation's protecting-power proves it a result of such selection. As to a bleaching and browning theory; many facts suggest that light does not tend to darken the coats of animals: Notice for instance the pale inhabitants of treeless regions, such as sandy beaches, etc., compared with wood-dwellers. But this discussion is outside my present purpose.

As an epigrammatic lash to my entire thesis on Protective Coloration, it is important to say that no other conceivable arrangement of light and dark colors could effect the intrinsic unsubstantiality of appearance guaranteed by the gradation therein set forth.

EVIDENCE SUGGESTIVE OF THE OCCURRENCE OF
'INDIVIDUAL DICHROMATISM' IN
MEGASCOPS ASIO.BY ARTHUR P. CHADBOURNE, M. D.¹

THE common Screech Owl and some of its varieties are typical examples of dichromatism, which may be defined as the occurrence of two distinct phases of color *in different individuals* of the same species, entirely independent of age, sex, or season. It is evident that "the occurrence of two distinct phases of color" *in the same individual*, if "independent of age, sex, or season," must constitute an *individual*, as distinct from the *specific* form of dichromatism. The following account of a pair of Screech Owls shows that 'individual dichromatism' probably occurs in this species, though it is doubtless infrequent, and possibly found only under artificial or even diseased conditions.

Two Screech Owls (*Megascops asio*), said to have been taken from the same brood late in the spring of 1894, were sent to me about Nov. 1, 1894. Both birds were in typical gray plumage, but a minute examination of the feathers was not made at the time, as the possibility of a change in phase had not been thought of, though, as an intermediate between the red and the gray plumage was wanted, it is safe to say that any reddish tint would have been noticed if present. The two Owls were in full autumn dress except for a few downy feathers near the so-called ears.

The Owls were put in a large box cage, with the front of wire netting; and a hole at one side opened into a second box, thus making a dark retiring place, that was never used. Six times each week they were given all the raw beef or sheep's liver that they wanted; but the seventh day they fasted. Fresh water for drinking and bathing, and also gravel were put in the cage daily; while in addition dead guinea pigs, and occasionally live mice, were to be had in the 'animal room' at the Medical School, where

¹ Read at the meeting of the Nuttall Ornithological Club, March 4, 1895.

the cage had been placed. These 'tid-bits' were the cause of much trouble, and after the first trial I never put a mouse in the cage unless there was a second mouse for the other Owl, as a dangerous fight was sure to be the result. By day their sight was as keen as at dusk, but the birds were more restless after dark, though it was necessary to watch closely to prevent them from slipping out while the door of the cage was opened to give them daily food, and I doubt if a movement of any kind was often made that their sharp eyes did not notice. Like all 'Scops' they were quickly tamed, and quite gentle unless frightened. Twice I heard the tremulous *whou-hou-hou-hou-hou* note, each time just after dusk when all was quiet and when no gas was lighted. Spitting, and a scolding rattle when disturbed, were the only other sounds that they were heard to utter. The 'pellets' were unlike those found near the familiar 'owl-holes' and looked like uncooked sausage-meat minus the fat. No gravel was ever found in these castings, yet though more friable than those of the wild birds, they were always firm, well formed, and seemingly held together by a sticky coating that soon dried and looked like gelatine.

Toward the last of November, nearly three weeks after arrival, the larger, and, as it proved, the female Owl, grew more and more red-brown in tint, until there was little pure gray to be found. This was followed by a constantly increasing amount of tawny red; while simultaneously the brownish tinge spread over the upper parts and tail-feathers, and the dark cross bars on the breast seemed to fade. The difference was so marked as to be spoken of by five different persons, who had seen the birds at first. Meanwhile the smaller Owl remained unchanged, so far as could be seen, although in the same cage and apparently under the same conditions as the other.

From the first I searched the cage daily for cast-off feathers, as I wanted to know the number lost when the birds were not molting. During the three weeks and two days only twenty-four feathers were found; 15 of the 'first plumage', 3 tail-feathers and 6 mature feathers, or at least not those of the first plumage. The twelve or even twenty-four new feathers, which had doubtless replaced those lost, were evidently not the cause of the general alteration

in tint that could be seen in almost every feather of the female. On the other hand, it might perhaps be claimed that the total number of feathers composing the plumage had increased, and that the new phase was due to the freshly developed feathers mingling with the old that had been present from the first. The interest and importance of the change in tint of the female Owl was now realized and a thorough search for pin-feathers was made, but without success. Three of the feathers on the breast that seemed without a trace of red or brown in the ground color, were then marked with a pair of scissors to see if they would remain unchanged, but within the next week I found all three feathers on the floor of the cage; two feathers around which I tied a bit of hair, were also cast off or pulled out; and the same result followed with two feathers that were slightly marked with a solution of eosine and water; and also with two that were marked with bi-chromate of potassium. There seemed to be only one way left in which to settle the question as to whether the gray feathers actually changed their tint; so having first 'mesmerized' (?) the owl by laying her on her back and gently stroking her head until she was quiet, I carefully counted all the feathers having a dark median stripe, but without any red or brownish tinge in the ground color, beginning just below the whitish feathers of the throat and going as far as the under tail-coverts, and from the median line of the body to the unstreaked downy feathers under the wing; the result was forty gray feathers. Only three weeks later, on Dec. 21, I could not find more than nine feathers that were free from brownish tinge. It must, I think, be admitted (1) *that an actual change from gray to red-brown took place in the individual feathers, and* (2) *that the red phase was not entirely, if at all, due to new feather growth in the present instance.*

Until December 22, the diet of beef liver was continued, but was occasionally varied by beef kidney, the other conditions remaining as before. The larger Owl continued to approach more and more nearly the red-brown phase, and on Dec. 21 had the general tawny-brown effect seen in specimens that do not show the brilliant red, typical of extreme examples of this phase. Both birds seemed healthy and well; but the smaller Owl now also showed more or less signs of reddish-brown here and there, and some

feathers taken from the breast on Dec. 21, were markedly tawny toward the base. From Nov. 1 until Dec. 21, a total of fifty-nine feathers had been lost by the two birds, but from this number, forty-two must be deducted—(9 lost because of my effort to mark them, 4 tail-feathers, 15 feathers evidently of the younger plumage, and the remaining 14 lost in a fight between the Owls for the possession of a mouse). This leaves for each of the Owls a total loss of nine feathers during the change described above; yet on one of the birds, as we have seen, the majority of the feathers were characteristic of the red-brown phase.

On Dec. 22, the Owls were sent to some Owl-loving friends in the country, where they could have space to fly about, and we hoped to have some young Owlets later. At this time the liver was stopped and they were fed upon raw meat. Every cast-off feather was carefully preserved and labelled, and I heard often of my pets, but especially about the color of the plumage. There seemed to be rather a loss, than an increase of the red-brown effect as time went on, and this was very evident, or at least I thought so, on Jan. 17, when I saw the surviving Owl, which was the larger red-brown female. The smaller and grayer bird had been killed and partly eaten by the other on Jan. 3.

On Jan. 19, the other Owl was found dead in her cage. She was sent to me and is now in my collection, No. 4397. A careful examination showed that the organs were all healthy macroscopically, but the bird was much emaciated, there being almost no fat about the kidneys and mesentery, and but little in the orbits. This was a marked contrast to the fatty degeneration from over-feeding which I believe is usual in captive Hawks and Owls. The condition of the bones of the skull proved that the bird was less than a year old.

This ends the history of my two pets, which I have intentionally given at considerable length. It seems certain that in the larger female Owl there was (1) *a change from the typical gray to the characteristic, though not extreme phase of red*; (2) *and that this was neither caused, nor accompanied by appreciable 'feather loss' (so-called 'molt')*; (3) *nor can it have been wholly, if at all, dependent upon new feather growth*; and (4) *it is also evident that there was a distinct change in the color of the individual feathers, which were apparently mature, as seen under the microscope.*

It cannot be said with absolute certainty that the reddish phase was "entirely independent of age, sex, or season," and hence an example of 'individual dichromatism'; but if due to such normal and universal laws as any of the above, the fact of a change of color in the individual could hardly have escaped the notice of ornithologists, while if caused by the ordinary conditions of captivity it must have been recognized long since. The evidence, therefore, seems to be *almost* conclusive that this Owl was an instance of what I have for convenience called '*individual dichromatism*'; and also that this condition is probably infrequent, and doubtless due to some unknown element, not common even in captivity.

(*To be concluded.*)

RECENT LITERATURE.

Sclater on Rules for Naming Animals.¹ — At the meeting of the Zoölogical Society of London, held March 6, 1896, the special topic assigned for discussion was the Code of Rules for Zoölogical Nomenclature adopted by the German Zoölogical Society, or rather the discrepancies between these rules and those of the Stricklandian Code, with a view to their possible reconciliation. The discussion was opened by Dr. Sclater, who appears to have made the principal address of the evening, and who was followed by other speakers.

The discussion, it may be remarked, was apropos of the new work planned by the German Zoölogical Society, called 'Das Tierreich,' which is to comprise the synonymy, the geographical range, and short descriptions of every known species of animal. It is, of course, of the highest importance in a standard work of this magnitude that the rules of nomenclature adopted shall be such as will command the respect of the greatest possible number of workers; for it is Utopian to expect that any code of rules can be devised at present, if ever, that will receive unanimous endorsement. As preliminary to its work the German Zoölogical

¹ Remarks on the Divergencies between the "Rules for naming Animals" of the German Zoölogical Society and the Stricklandian Code of Nomenclature. By P. L. Sclater. Proc. of the Zoöl. Soc. of London, 1896, pp. 306-319.

Society adopted in 1894 a code of rules for zoölogical nomenclature,¹ which, while differing quite radically in several important points from the British Association Code, is fortunately in essential accord with all other recent Codes, the tendency being toward unity on the few leading points in which the British Code differs from the later systems of rules. In respect to the German Code, it may be sufficient to say that in only one particular does it differ from the A. O. U. Code, namely, in permitting "purely orthographical correction when the word is, without doubt, wrongly written or incorrectly transcribed." This is a minor point, in no way seriously affecting names.² As compared with the British Code, it (1) adopts the Xth edition of Linnæus's '*Systema Naturæ*' as the starting point for the law of priority; (2) it disclaims any relationship between the nomenclature of zoölogy and botany; (3) the same term may be used for the generic and specific name of a species when these names have priority.

As Mr. Sclater points out, these are the three essential points of difference between the German and British Codes, the latter adopting the Xth edition of Linnæus as its starting point for the law of priority; and holding that the same generic name must never be used in botany and zoölogy, and that a new specific name must be given to a species when its old name has been adopted for a genus.

On all these points Mr. Sclater upholds the British system. Respecting the first he says: "Strickland, the founder of our modern Codes of Nomenclature, after deliberately considering the point, adopted the latest and most perfect edition of the '*Systema Naturæ*' as his starting point. I think we should do unwisely to deviate from Strickland's views on this subject. . . . On the ground of priority, therefore, I claim that, as first decided by Strickland, we ought to adopt the twelfth and most perfect edition of the '*Systema Naturæ*' as the basis of modern Nomenclature." This, as has been repeatedly shown, is a lame defense, hardly worthy of serious consideration. But are the statements regarding Strickland quite correct? According to the 'Revised Rules' of the British Association: "In Mr. H. E. Strickland's original draft of these Rules and Recommendations the edition of Linnæus was left blank, and the XIIth was inserted by the Manchester Committee." There is, besides, evidence to show that Mr. Strickland considered the Xth edition as the starting point for binomial nomenclature.³

¹ Regeln für die wissenschaftliche Benennung der Thiere zusammengestellt von der Deutschen Zoologischen Gesellschaft. Leipzig, 1894.

² The A. O. U. Code (Canon XL) provides that "The original orthography of a name is to be rigidly preserved, unless a typographical error is evident." This, it must be admitted, has met with wide-spread disapproval, though advocated by De Candolle in 1883, and in favor of which, in the interest of absolute fixity of names, there is still much to be said.

³ Cf. Auk, I, 1884, p. 400.

Thus apparently Mr. Sclater concedes practically nothing in the interest of "reconciling the differences between the German Rules and the Code of Nomenclature adopted by the British Association"; he strenuously upholds the British Code on the three essential points wherein it differs from the German Code, regardless of the fact that within the last ten years the whole world of zoölogists, outside of the British Islands, has gone over to the opposite view, and that a number of prominent British zoölogists have also recently joined the great and ever increasing majority against the British Code. We must say, with regret, that this looks like unwise conservatism, bordering on perversity; for the few British naturalists who still stick to the British rules can hardly expect the rest of the world to waive their better judgment in favor of insular sentiment and traditions.

Mr. Sclater has much to say in favor of the German Code where it is in agreement with the British rules, and has even been willing to make concessions on one or two minor points. One of these is that "the name of the author, if given, should follow the scientific name without intervening sign," as is expressly provided in the A. O. U. Code and approved by the German zoölogists. It is with regret, therefore, that we have observed in certain publications in this country a tendency to insert a comma between the scientific name and the authority, and especially in the publications of our own National Museum, where, up to a few years ago, the contrary practice prevailed.

We are glad also to see that Mr. Sclater here comes out squarely in favor of the use of trinomials for subspecies,—which, it is true, he has used quite freely for some years past. On this point he says: "That subspecies actually exist in nature cannot, I think, be denied by anybody who believes in the origin of species by descent. Nearly all forms of animal life, which have a wide distribution, show differences when individuals from the two extremes of the range of the species are compared. . . . 'Subspecies' appears to me to be an excellent term to designate the slight differences exhibited in these cases, far better than 'climatic' or 'geographical' variety, which is often used for them. . . . The British forms of the Coal Tit and the Marsh Tit, which have been named *Parus britannicus* and *Parus dresseri*, appear to me to be good instances of subspecies. I should propose to call them *Parus ater britannicus* and *Parus palustris dresseri*, while the corresponding forms of the continent should be termed *Parus ater typicus* and *Parus palustris typicus* when they are spoken of in the restricted sense only. In ordinary cases, however, it is sufficient to say *Parus ater* and *Parus palustris* without any reference to the subspecies. To give these slight and in some cases barely recognizable variations the same rank as is awarded to *Turdus musicus* and *Turdus viscivorus* seems to me highly undesirable, and the recognition of subspecies indicated by trinomials gives us an easy way out of the difficulty." While of course all this has been said before, it is gratifying, as we recall the past in relation to trinomials, to see it restated in the present connection.

As 'Appendix I' to his address, Mr. Sclater gives an English transla-

tion of the 'Rules,' twenty-eight in number, adopted by the German Zoölogical Society for the scientific naming of animals, the explanations and comment accompanying the original rules being, however, omitted. 'Appendix II' gives a convenient list of 'Titles of the principal Modern Codes of Zoölogical Nomenclature,' eleven in number.

The discussion following Mr. Sclater's paper included a communication from Graf Hans von Berlepsch, and remarks by Sir William Flower, Mr. Hartert, Professor Lankester, Mr. Elwes, Dr. D. Sharp, Mr. W. T. Blandford, Dr. H. O. Forbes, and Mr. W. F. Kirby. In the main their views are so inharmonious, aside from the three main points under discussion, as to discourage the hope of an immediate general agreement on principles of nomenclature. Some of the writers favored the Xth edition and others the XIIth edition of Linnæus as the starting point; some even seemed doubtful about taking either, but favored the selection of some much more recent period—some standard work for any branch of zoölogy where such a work is available, taking the names there given, whether right or wrong, and in defiance even of the law of priority. It was also suggested that International Committees be appointed, "*not* to draw up a Code of rules, but to produce an *authoritative* list of names—once and for all—about which no lawyer-like haggling should hereafter be permitted"! Any attempt to combat such crude notions would evidently be a waste of energy!

Professor Lankester, "thought the XIIth edition of the 'Systema Naturæ' should be adopted as the starting point of Zoölogical Nomenclature, as a tribute of respect to Linnæus, since it was the last edition of that work and contained Linnæus's revised list of genera and species." Mr. Hartert thought that the Xth edition of this work should be taken as the correct starting point, "because in that edition Linnæus first made use of the binary system of nomenclature; and as the question of justness had been mentioned he considered that it would be unjust to authors who created names between the dates of the two editions, if the twelfth were adopted; he was, moreover, of opinion that if the XIIth edition were adopted, because it contained corrections and emendations of the older edition, it would make a bad precedent, and that any other author might, if so inclined, claim to alter his original names after he had created and published them, and so cause confusion." We give this as the gist of the whole argument on the matter of the two editions, and commend Mr. Hartert's clever *reductio ad absurdum*.—J. A. A.

Swann's Handbook of British Birds.—This little manual¹ is certainly what its title implies—a *concise* handbook of British Birds, or, as claimed in the preface, "a handy textbook of reference," small enough

¹ A Concise Handbook | of | British Birds | By | H. Kirke Swann | Editor
of "The Ornithologist." | — | London: | John Wheldon & Co., | 58, Great
Queen Street, W. C. | 1896. 16 mo, pp. viii+210.

to be easily carried in the pocket. In view of the many 'manuals' and 'handbooks' of British birds, its compact form and small size must be its main *raison d'être*. There is no introductory matter beyond the preface, no diagnoses of the higher groups, no analytical keys, no general analysis of the avifauna as regards the manner of occurrence of the species, and, finally, no index! As 381 species and about a dozen additional subspecies are treated in the course of 208 pages, the descriptions are necessarily brief and the biographical matter is reduced to a minimum. Nevertheless it must serve as a "handy textbook of reference" to those who have already some knowledge of British birds, but hardly as the most convenient form of a manual for the beginner. Some 30 species usually included in British lists are "provisionally excluded," being relegated to a nominal list in the Appendix, on the ground that their "recorded occurrences are either insufficiently authenticated or somewhat improbable."

The classification and nomenclature is practically that of the B. O. U. List, "but a number of necessary alterations have been made, particularly in the matter of adopting the specific names of the *first* describers as far as possible. An effort has also been made to allow specific rank to valid species only, while subspecies or races, instead of being nameless, are distinguished by sub-numbers and trinomials—after the American style." He adds that he does not expect to "escape censure for adopting the despised system, yet until some of our ornithologists can suggest some other way of allowing a name to a recognized race without giving it the rank of a species, I will adhere to trinomials." He says further that with the exception of the late Henry Seebohm, "no British ornithologist appears to have openly avowed himself a trinomialist." He is not, however, quite so destitute of good company as a trinomialist among his own countrymen as he seems to suppose, as witness the use of trinomials by numerous British naturalists, and their recent formal approval by Mr. Sclater (see above, p. 327) — J. A. A.

Loomis on California Water Birds.¹—Mr. Loomis continues his studies of the Water Birds of the Californian coast by a visit to South Farallon Island from July 8 to 16, 1896. Interesting notes are given on the habits of the ten species of Water Birds found nesting there, with remarks on four so-called "non-indigenous" species.

Speaking of the wholesale robbery of Murres' eggs to supply the San Francisco market, Mr. Loomis says: "It is apparent that unless this devastation is put an end to, the Farallon Murre rookeries will ere long belong to the past. A State law prohibiting the sale of eggs of wild birds and prompt action on the part of the lighthouse board will preserve this

¹ California Water Birds. No. III. South Farallon Island in July. By Leverett M. Loomis, Curator of the Department of Ornithology. Proc. Cal. Acad. Sci., Ser. 2, Vol. XI, pp. 353-366, 2 maps.

wonderful marine aviary—second to none of the natural features of California.” In 1884 it is said 300,000 eggs were gathered and the market was glutted, while the present year only 91,740 have been taken. Comparatively few birds are allowed to breed and such merciless persecution can but result in extinction. The commercial value of these rookeries will doubtless prevent their protection from purely sentimental grounds, but if it can be shown that the present course will end in the destruction of the egg industry, it might be possible to secure the enactment of a law which would protect the birds for at least the latter half of the nesting season.—F. M. C.

Ridgway on New Species and Subspecies of Birds¹.—In the three papers here cited, none of which bears date of publication, Mr. Ridgway describes *Geothlypis flaveolatus* from near Tampico on the Gulf coast of Mexico, a form which, strangely enough, is most closely related to *G. beldingi* of Lower California; *Geospiza pachyryncha*, *G. fatigata*, *Camarhynchus bindloei*, *C. compressirostris*, and *C. incertus* from the apparently exhaustless Galapagos, and *Peucedramus olivaceus aurantiacus* from Guatemala.—F. M. C.

Oberholser on Two New Subspecies of Dryobates.²—Comparison of a series of 200 Downy Woodpeckers has impressed Mr. Oberholser with the differences in size and color existing between specimens from the South Atlantic and Gulf States and those from Alaska and northern British America, and he therefore separates these extremes under the names *Dryobates pubescens meridionalis* (Swainson) and *Dryobates pubescens nelsoni* (Oberholser) respectively, leaving *Dryobates pubescens* as a transition form occupying the intervening region.—F. M. C.

Richmond on Mexican Birds.³—This is a nominal list of 58 species, with the number of specimens of each, received by the National Museum

¹ 1. Description of a New Species of Ground Warbler from Eastern Mexico. By Robert Ridgway, Curator of the Department of Birds. Proc. U. S. Nat. Mus., XVIII, p. 119.

2. Preliminary Description of some New Birds from the Galapagos Archipelago. *Ibid.*, p. 293.

3. Description of a New Subspecies of the Genus *Peucedramus*, Coues. *Ibid.*, p. 441.

² Description of Two New Subspecies of the Downy Woodpecker, *Dryobates pubescens* (Linnæus). By Harry C. Oberholser. Proc. U. S. Nat. Mus., XVIII, 1895, p. 547.

³ Partial list of Birds collected at Alta Mira, Mexico, by Mr. Frank B. Armstrong. By Charles W. Richmond, Assistant Curator of the Department of Birds. Proc. U. S. Nat. Mus., XVIII, 1896, pp. 627-632.

from the collector. The one new species contained in the collection has been described by Mr. Ridgway as *Geothlypis flavovelatus*. (See *antea*, p. 330).—F. M. C.

Richmond on New Species of Birds.¹—Mr. Richmond here describes *Ægialitis thoracica*, apparently most nearly related to *Æ. varia*, and *Phlegopsis saturata*, a Nicaraguan representative of the Panama *P. macleani*.—F. M. C.

Dr. Abbott's Collections from Asia.²—The two papers here cited are detailed lists of the birds collected by Dr. Abbott, giving the data of each specimen, including color of the irides, bill, and feet. The first paper is based on 746 specimens, referable to 188 species; the second, on 210 specimens, representing 98 species. *Cyanecula abbotti* from Ladak, *Merula merula intermedia* from Eastern Turkestan, and *Ægialitis pamirensis* from Pamir, are described as new.—F. M. C.

Dr. Abbott's Collections from the Seychelles and other Islands.³—This paper is an important contribution to our knowledge of the distribution of birds in these Madagascan islands. Sixteen land birds are recorded from the Seychelles group, eight from the Amirante group, four from Assumption Island, eight from Gloriosa Island, and twenty from Aldabra Island. Dr. Abbott's field-notes relate almost wholly to the birds of the last named

¹ 1. Description of a New Species of Plover from the East Coast of Madagascar. By Charles W. Richmond. Proc. Biol. Soc. Wash., X, March 14, 1896, p. 53.

2. Description of a New Species of Ant Thrush from Nicaragua. By Charles W. Richmond, Assistant Curator of the Department of Birds. Proc. U. S. Nat. Mus., XVIII, p. 625.

² 1. Catalogue of a Collection of Birds made by Dr. W. L. Abbott in Kashmir, Balistan and Ladak, with Notes on Some of the Species, and a Description of a New Species of *Cyanecula*. By Charles W. Richmond, Assistant Curator of the Department of Birds. Proc. U. S. Nat. Mus., XVIII, 1896, pp. 451-503.

2. Catalogue of a Collection of Birds made by Dr. W. L. Abbott, in Eastern Turkestan, the Thian-Shan Mountains, and Tagdumbash Pamir, Central Asia, with Notes on Some of the Species. By Charles W. Richmond, Assistant Curator of the Department of Birds. Proc. U. S. Nat. Mus., XVIII, 1896, pp. 569-576.

³ On Birds Collected by Doctor W. L. Abbott in the Seychelles, Amirantes, Gloriosa, Assumption, Aldabra, and Adjacent Islands, with Notes on Habits, etc., by the Collector. By Robert Ridgway, Curator of the Department of Birds. Proc. U. S. Nat. Mus., XVIII, 1896, pp. 509-546.

island. His observations on the flightless Rail (*Dryolimnas aldabranus*) are particularly interesting.

Thirteen of the birds collected by Dr. Abbott in these islands have been previously described as new by Mr. Ridgway¹, and the name *Turtur abbotti* is here proposed for the Seychelles form of *T. picturatus*.

An Appendix gives a useful tabular list, showing the distribution of the 212 birds known from the entire Madagascan group of islands, from Mauritius to Comoro, and a bibliography — F. M. C.

Robinson's Birds of Margarita.² — In 1876, when the Smithsonian Institution sent Mr. F. W. Ober to make collections of birds in the Lesser Antilles, there were only two of the larger islands of the Caribbean basin, Cuba and Jamaica, of whose avifauna we possessed anything approaching a complete knowledge. It is an indication of the activity shown in ornithological research during the past twenty years that the island visited by Lieut. Robinson was the only one in the whole West Indian and Caribbean group which had not been more or less explored by ornithologists. Margarita, like Trinidad, is a continental island and has derived its avifauna from Venezuela, from which it is distant only seventeen miles. It is forty-two miles long and twenty and one-half miles wide in its greatest dimensions. The southern shore in the vicinity of Porlamar, where Lieut. Robinson landed, is "flat or gently rolling" and grown with scrubby thorn trees, cacti, etc. "About three miles inland foothills begin, which rise by leaps to a central peak, 3,240 feet in height," a sufficient height to condense the moisture of the warm trade-winds, giving a rainfall which produces a heavy forest.

Lieut. Robinson had only sixteen days' collecting on Margarita, but the fact that he began half an hour after landing is good evidence that he made the most of this time. He worked both in the dry coast region and in the mountain forests, securing 200 specimens and recording 73 species.

Of a number of these interesting biographical notes are given. Thus the calls of *Eupsychortyx pallidus* resemble those of our Bob-white, a marked instance of the stability of call-notes and suggesting common ancestry; *Bucco bicinctus* nests in holes in the dwellings of termites; the Buff-breasted Hummingbird feeds in part on fruit and has a song of decided character, and *Myiarchus tyrannulus*, like our own *Myiarchus*, uses a cast-off snake skin for home decoration, evidence of the antiquity of a habit which has doubtless persisted long after its cause has ceased to

¹ Proc. U. S. Nat. Mus., XVI, 1893, pp. 4, 597-599; XVII, 1894, 371-373; Auk, XI, 1894, 74.

² An Annotated List of Birds Observed on the Island of Margarita, and at Guanta and Laguayra, Venezuela. By Wirt Robinson, First Lieutenant, Fourth U. S. Artillery, with Critical Notes and Description of New Species, by Charles W. Richmond, Assistant Curator, Department of Birds. Proc. U. S. Nat. Mus., XVIII, 1896, pp. 649-685, one map.

be potent. *Chordeiles acutipennis* is said to flit along the road at dusk and alight in front of the traveller; a rather unusual habit for a Nighthawk. Is it not possible the bird observed was *Nyctidromus*?

Mr. Richmond has made good use of Lieut. Robinson's collection, adding numerous critical notes and describing no less than ten species as new, most of which are apparently pale island forms of mainland species; they are the following: *Butorides robinsoni*, *Eupsychortyx pallidus*, *Leptotila insularis*, *Scardafella ridgwayi*, *Speotyto brachyptera*, *Doleromyia pallida*,¹ *Amazilia aliciae*,² *Dendroplex longirostris*, *Quiscalus insularis*, *Cardinalis robinsoni*,³ and *Hylophilus griseipes*.

In conclusion lists of birds identified during a few days' stay at Guanta and Lagunayra are given.—F. M. C.

Cherrie on San Domingo Birds.⁴—Of all the West Indian islands, San Domingo is least known ornithologically. Cuba, Jamaica, and Porto Rico, of the larger islands, have had resident naturalists who have made us acquainted with the fauna of their homes, while the smaller islands could be explored by an energetic collector during a few months' visit. It may be safely said, therefore, that only in San Domingo and Hayti alone is there a probability of discovering birds new to science. Students of the West Indian avifauna will thus welcome this paper by Mr. Cherrie, whose ability as a collector has been proved in other fields.

In an interesting introduction, descriptive of his travels in the island from January to May, 1895, there is abundant evidence that patience, experience, a fever-proof constitution, and enthusiasm were needed to carry the trip to the successful conclusion which the succeeding pages record, while a record of 210 bird-skins in five days' collecting show that material results are not wanting.

Mr. Cherrie's list of only eighty-three species betrays the poverty of an insular avifauna, but of these we have numerous interesting observations on notes and habits. *Dulus dominicus* is stated to build one large nest which is used by a number of females; *Nesocittes micromegas* often resembles some Warblers in actions, while *Chloronerpes striatus* is a Sap-sucker. Our Yellow-billed Cuckoo (*Coccyzus americanus*) is probably a summer resident in San Domingo, a considerable extension of its known breeding range, which was previously supposed to be from Florida north-

¹ Previously described in 'The Auk,' XII, 1895, 369.

² Previously described in 'The Auk,' XII, 1895, 368.

³ Previously described in 'The Auk,' XII, 1895, 370.

⁴ Field Columbian Museum. Publication 10. Ornithological Series, Vol. I, No. 1. Contribution to the Ornithology of San Domingo. By George K. Cherrie, Assistant Curator of Ornithology. Charles B. Cory, Curator of Department. Chicago, U. S. A., March, 1896. 8vo. pp. 26.

ward. Five females with enlarged ovaries were taken and one contained an egg "that would have been deposited in one or two days."

The two new birds discovered have been described by Mr. Cory in this Journal (Vol. XII, 1895, p. 278). One, *Elainea cherriei*, is related to *E. fallax* of Jamaica, the other, *Hyetornis fieldi*, is a very interesting addition to this genus, which before contained only the Jamaican *Hyetornis pluvialis*.—F. M. C.

Warren's 'Taxidermy' and Bird-Laws.¹—Dr. Warren writes (Introduction, p. 9): "This Bulletin has been prepared to enable earnest students of ornithological science, who have complied with all the requirements of the act of May 14, 1889 (page 55), to learn some facts concerning the collecting and preservation of birds and their eggs." The object is a worthy one in so far as it relates to "earnest students of ornithological science," but we fear that the wholesale distribution of a pamphlet of this nature will awaken an interest in 'bird-stuffing' and result in the needless destruction of large numbers of birds. Birds mounted on "plush-covered panels" or "bamboo screens" are surely not in use for the "strictly scientific purposes" of the state law (p. 56), and suggestions for purely decorative work of this kind seem out of place in a treatise addressed to "students of ornithological science."

We are surprised to see that in spite of Dr. Warren's efforts Hawks and Owls are not protected by the Pennsylvania law.—F. M. C.

Ridgway and Lucas on a New Family of Birds.²—In 'The Auk' for April, 1895, p. 186, Mr. Lucas states that "Mr. Ridgway has found it necessary to establish a new family for the reception of the genus *Procnias* but the diagnosis has only recently appeared, in addition to which Mr. Lucas gives in a separate paper the osteological and pterylographical characters. The group has hitherto held the position of a subfamily of the Tanagridæ; and no one familiar with these birds can have failed to notice their aberrant characters, as compared with other Tanagers. Mr. Lucas says, respecting the osteology, that the skull, "in spite of its

¹ Bulletin No. 6. Department of Agriculture. Division of Economic Zoölogy. Taxidermy. How to Collect, Skin, Preserve and Mount Birds. The Game and Fish Laws of the Commonwealth of Pennsylvania. Illustrated. By B. H. Warren, M. D., State Zoölogist, Harrisburg, Pa. Second edition. Clarence M. Busch, State Printer of Pennsylvania, 1896. 8vo. pp. 128, fig. xi.

² Characters of a New American Family of Passerine Birds. By Robert Ridgway, Curator of the Department of Birds. Proc. U. S. Nat. Mus., XVIII, No. 1076, pp. 449, 450.

Osteological and Pterylographical Characters of the Procnitidæ. By F. A. Lucas, Curator of the Department of Comparative Anatomy. *Ibid.*, No. 1077, pp. 505-507, with 5 cuts.

superficial resemblance to that of a Swallow is structurally "more nearly like that of such a typical Tanager as *Piranga erythromelas*," but in the characters of the palate, *Procnias* departs so widely not only from the Tanagers but from the large majority of Passerine birds, as to warrant the establishment of a separate family for the members of the genus." The pterylographical notes have been contributed by Mr. Herbert L. Clark, who says that while the pterylosis of *Procnias* is evidently passerine, it "shows no particular leaning to any group." Figures are given of the palatal region of the skull, and of the dorsal feather tracts, the former in comparison with a Swallow and a Tanager, and the latter with those of several species of Tanagers.—J. A. A.

Montgomery on Migration as a Check upon Geographical Variation¹.—The evidence is so clearly in favor of Mr. Montgomery's proposition that few doubtless will question the correctness of his main conclusions. While we do not recall having seen the matter formally stated, doubtless the coincidences here stated have not failed of recognition on the part of many students of geographical variation. The author calls attention to the fact that birds which are non-migratory, or which migrate only to a limited extent, in case they have also a wide geographical distribution, are apt to become differentiated into more or less well-marked subspecies under the varying conditions of environment of the widely separated parts of their range, while birds that migrate extensively, say through 30° or more of latitude, even if widely dispersed during the breeding season, seldom show a tendency to become differentiated into subspecies. This he believes is due to the fact that "the influence of the winter environment acts as a check upon the acquisition of adaptations suited alone to the summer environment."—J. A. A.

Contributions to Economic Ornithology.—The 'Yearbook of the U. S. Department of Agriculture for 1895', recently issued, contains two noteworthy contributions to economic ornithology. Mr. Sylvester D. Judd reports on the food and general habits of the Catbird, Brown Thrasher, Mockingbird, and House Wren, each species being illustrated with an excellent full-length cut by Mr. J. L. Ridgway. The verdict is favorable to all, as they subsist largely upon injurious insects. The House Wren is "exclusively insectivorous"; the others live partly on fruits, some of which are cultivated.

¹ Extensive Migration in Birds as a Check upon the Production of Geographical Varieties. By Thomas H. Montgomery, Jr., American Naturalist, June, 1896, pp. 458-464.

² Four Common Birds of the Farm and Garden. By Sylvester D. Judd, Assistant Ornithologist, U. S. Department of Agriculture. Yearbook of the U. S. Department of Agriculture for 1895, pp. 405-418, with 4 cuts.

Prof. F. E. L. Beal¹ writes of the Meadowlark and Baltimore Oriole, which species are also well figured. About 83 per cent of the Oriole's food consists of insects, of which more than one-third are caterpillars. Despite a slight taste for green peas, and a propensity to puncture grapes, the farmer is counselled "to hold his good opinion of the Oriole, and accord it the protection it so well deserves." The food habits of the Meadowlark are almost above reproach; "far from being injurious, it is one of the most useful allies to agriculture, standing almost without a peer as a destroyer of noxious insects."

The 'Report on the Gypsy Moth,' by Mr. Edward H. Forbush and Prof. Charles H. Fernald,² recently published under the direction of the State Board of Agriculture of Massachusetts, contains 40 pages (pp. 203-243) on 'The Usefulness of Birds as Insect Destroyers,' prepared by Mr. Forbush as a part of his chapter on the 'Natural Enemies of the Gypsy Moth.'

After several pages of introductory matter on the general subject of the utility of birds as insect destroyers, Mr. Forbush gives a list of 38 species of birds seen to feed on the gypsy moth, only about a dozen of which, however, seem to be especially useful as destroyers of this pest. These are mentioned specifically and in detail, there being a short report about each; then follow remarks about other useful birds, and many pages of field observations, showing how the birds are attracted to the infested localities and their methods of attacking the moth in its various stages of existence. These field notes on the various birds observed give striking evidence of the usefulness of birds as insect destroyers. With such facts before him it is natural that Mr. Forbush should urge better protection for our birds. As Massachusetts is much the same—at least no worse—than other parts of the country, we may well quote the following from Mr. Forbush's appeal for the birds. "While the present laws for the protection of insectivorous birds are wise in the main, no adequate provision

¹ The Meadow Lark and Baltimore Oriole. By F. E. L. Beal, Assistant Ornithologist, U. S. Department of Agriculture. Yearbook of the U. S. Department of Agriculture for 1895, pp. 419-430, with 2 cuts.

² The Gypsy Moth, *Porthetria dispar* (Linn.). A Report on the Work of destroying the Insect in the Commonwealth of Massachusetts, together with an Account of its History and Habits both in Massachusetts and Europe. By Edward H. Forbush, Field Director in Charge of the work of destroying the Gypsy Moth, Ornithologist to the State Board of Agriculture, etc., and Charles H. Fernald, A. M., Ph.D., Professor of Zoölogy in the Massachusetts Agricultural College, Entomologist to the State Board of Agriculture, etc. Published under the direction of the State Board of Agriculture by Authority of the Legislature. Boston: Wright & Potter Printing Co., State Printers, 18 Post Office Square. 1896, 8vo. pp. xii + 495 + c, with 5 maps, 65 plates, and numerous cuts.

is made for their enforcement, and they are consequently a dead letter to certain classes of people. A great many birds are killed and many nests broken up by boys. In the fall the country swarms with gunners. Thousands of birds are killed for the milliners. The camps of Italians, where employees engaged on public works are quartered, furnish many of these gunners. These men will shoot birds of any kind, anywhere and on any man's premises. Everything that wears feathers is considered by them as fair game." He advocates the appointment of officers to enforce the laws, and the education of children regarding the usefulness of birds, and holds that it should generally be considered a crime to destroy insect-eating birds. Laws, however good, will not execute themselves, and officers should certainly be provided to rigidly enforce the statutes for the protection of birds.

Mr. Forbush has also recently published a paper on the economic status of the Crow,¹ in which he treats of its migrations and general habits, especially in relation to its food. After commenting at length on previous reports on the food of the Crow, and giving many original observations of his own on the subject, he closes his paper without taking a very decided stand in regard to whether the Crow has been shown to be more useful than destructive to the interests of the farmer. Finally, after weighing the evidence, pro and con, he says that "from what is now known about the Crow's food we may conclude that, unless the birds become unduly numerous, they are likely to be of great service to the farmer. It will pay the farmer to sacrifice some portion of his products to the Crow, provided he uses care that the cunning bird does not overreach him in the bargain."

A further excellent contribution to the literature of economic ornithology is a series of papers by Miss Florence A. Merriam in recent issues of 'Forest and Stream,' under the title, 'How Birds affect the Farm and Garden', and since separately republished.² The introductory pages treat of the losses caused by insects, and the usefulness of birds in holding the insect pests in check; some 40 species of North American birds are then dealt with formally, followed by 'Conclusion', giving a list of some of the most formidable of our insect enemies and of the birds that have been proved to be their natural enemies. Speaking of the scientific investigation of the food habits of birds, Miss Merriam says: "So far as it has gone, the examination of the stomach contents of birds has proved that,

¹The Crow in Massachusetts. By E. H. Forbush, Ornithologist to the Board. Bulletin of the Massachusetts Board of Agriculture, Ser. of 1896, No. 4, August, 1896, pp. 24-40.

²How Birds affect the Farm and Garden. By Florence A. Merriam. Forest and Stream, Vol. XLVII, 1896, No. 6, Aug. 8, pp. 103, 104; No. 7, Aug. 15, pp. 123, 124; No. 8, Aug. 22, pp. 144, 145. Also separate, under the same title, 16mo., pp. 32.

except in rare cases, where individuals attack cultivated fruits and grains our native birds merely preserve the balance of nature by destroying weeds that plague the farmer and by checking the insects that destroy the produce of the agriculturist. The great value of birds is demonstrated. The question is first how to attract them where they have disappeared, and then how to protect the crops from their occasional depredations."

The English Sparrow comes in for severe condemnation. "It has been shown to interfere with seventy kinds of our own birds, most of which nest about houses and gardens and are beneficial to the farm and garden." Its extermination is advocated. "Bounty laws cannot do this, for, as has been clearly demonstrated, they do more mischief than can be easily remedied, as money is usually spent on the heads of valuable birds that have been mistaken for the injurious ones. But the work might be effectively done by State boards or commissioners, who should hire trained assistants to destroy the birds and their nests."

Miss Merriam's articles are illustrated with numerous cuts of the birds and insects especially mentioned, derived mainly from the recent publications on these subjects by the U. S. Department of Agriculture.—J. A. A.

Publications Received.—Alfaro, Anastasio. Museo Nacional de Costa Rica. Informe presentado al Señor Secretario de Estado en el Despacho de Fomento por Anastasio Alfaro, Administrador del Museo. 4to, 1896, pp. iv + 40.

Allen, Francis H. Summer Birds of Willoughby Lake. (St. Johnsbury Caledonian (newspaper), Sept. 11, 1896.)

Beal, F. E. L. The Meadowlark and Baltimore Oriole. (Yearbook U. S. Dept. of Agric. for 1895 (1896), pp. 419-430.)

Blasius, R. V. Berichte über das permanente internationale ornithologische Comité für die Jahre 1891 bis 1895. 8vo, pp. 27, 1896.

Bocage, J. V. Barboza du. Mamíferos, Aves e Reptis da Hanha, no Sertão de Benguela. (Jorn. de Sci. math., phys. e nat. da Acad. real das Sci. de Lisboa, Ser. 2, IV, No. xiv, May, 1896.)

Büttikofer, J. (1) On a probably new species of *Crypturus*. (Notes from the Leyden Museum, XVIII, pp. 1, 2.) (2) On the Genus *Pycnonotus* and some Allied Genera, with enumeration of the specimens in the Leyden Museum. (*Ibid.*, XVII, pp. 225-252) (3) Rectification of two Generic Names. (*Ibid.*, XVIII, p. 58.) (4) On a New Duck from the Island of Lumba. (*Ibid.*, XVIII, pp. 59-62.) (5) Zoologische Skizzen aus der niederländischen Expedition nach Central Borneo. (Compte-rendu des Séances du Troisième Congrès international de Zoologie, Leyde, 16-21 Sept., 1895, pp. 212-227.)

Cherrie, George K. Contributions to the Ornithology of San Domingo. (Field Columbian Mus., Orn. Ser., I, No. 1, pp. 1-26, 1896.)

Fisher, A. K. Summer Roosts of Swallows and Red-winged Blackbirds. (The Observer, VII, July, 1896, pp. 382-384.)

Forbush, Edward H., and Charles E. Fernald. The Gypsy Moth, *Por-thetria dispar* (Linn.). A report of the work of destroying the insect in the Commonwealth of Massachusetts, together with an account of its History and Habits, both in Massachusetts and Europe. Mass. State Board of Agriculture, Boston, 1896, 8vo, pp. xii + 496 + c, with numerous plates and cuts.

Hartert, Ernst. On ornithological collections, made by Mr. Alfred Everett, in Celebes and on the islands south of it. (Novitates Zool., III, June, 1896, pp. 148-183.)

Holland, A. H. Field-notes on the Birds of the Estancia Sta. Elena, Argentine Republic.—Part III. With Remarks by P. L. Sclater. (Ibis July, 1896, pp. 315-318.)

Homeyer, E. F. von. Museum Homeyerianum. Verzeichniss der ornithologischen Sammlungen. 8vo, pp. 36.

Judd, Sylvester D. Four Common Birds of the Farm and Garden. (Year-book U. S. Dept. of Agric. for 1895, pp. 405-418.)

Loomis, Leverett M. California Water Birds, No. III, South Farallon Island in July. (Proc. Cal. Acad. Sci., Ser. 2, Vol. VI. pp. 353-366.)

Lucas, F. A. Osteological and Pterylographical Characters of the Procnatiidae. (Proc. U. S. Nat. Mus., XVIII, No. 1077, pp. 505-507.)

Merriam, Florence A. How Birds affect the Farm and Garden. 16mo, Sept. 1896. Forest and Stream Publishing Company. Price 5 cts.

Montgomery, Thomas H. Extensive migration in Birds as a check upon the production of Geographical Varieties. (Am. Nat., June, 1896, pp. 458-464.)

Nehrling, H. North American Birds. Pts. XIV and XV.

Oberholser, Harry C. Descriptions of two new Subspecies of the Downy Woodpecker, *Dryobates pubescens* (Linn.). (Proc. U. S. Nat. Mus. XVIII, No. 1080, pp. 547-550.)

Palmer, T. S. Bird Day in Schools. (Circular No. 17, U. S. Dept. of Agriculture, Division of the Biological Survey. 8vo. pp. 4, July, 1896.)

Ridgway, Robert. (1) Characters of a New American Family of Passerine Birds. (Proc. U. S. Nat. Mus., XVIII, No. 1076, pp. 449, 450.) (2) On Birds collected by Dr. W. L. Abbott in the Seychelles, Amirantes, Gloriosa, Assumption, Aldabra, and adjacent Islands, with notes on Habits, etc., by the Collector. (*Ibid.*, No. 1079, pp. 509-546.)

Richmond, Charles W. (1) Catalogue of a Collection of Birds made by Dr. W. L. Abbott in Kashmir, Baltistan and Ladak, with notes on some and a description of a new species of *Cyanecula*. (Proc. U. S. Nat. Mus. XVIII, No. 1078, pp. 451-503.) (2) Catalogue of a Collection of Birds made by Dr. W. L. Abbott, in Eastern Turkistan, the Thian-Shan Mountains, and Tagdumbash Pamir, Central Asia, with notes on some of the species. (*Ibid.*, No. 1083, pp. 569-576.) (3) Description of a New Species of Ant Thrush from Nicaragua. (*Ibid.*, No. 1090, pp. 625, 626.) (4) Partial List of Birds collected at Alta Mira, Mexico, by Mr. Frank B. Armstrong. (*Ibid.*, No. 1091, pp. 627-632.)

Robinson, Wirt. An Annotated List of Birds observed on Margarita Island, and at Guanta and Laguayra, Venezuela. (*Ibid.*, No. 1093, pp. 649-685.)

Slater, P. L. Remarks on the Divergencies between the "Rules for Naming Animals" of the German Zoölogical Society and the Strickland Code of Nomenclature. (P. Z. S., 1896, pp. 306-322.)

Shufeldt, R. W. On the Affinities of *Harpagornis*. (Trans. New Zealand Inst., XXVIII, p. 666.)

Swann, H. Kirke. A concise Handbook of British Birds. Sm. 8vo, pp. vii + 210. London, 1896, John Wheldon & Co. Price, 3s. 6d.

Warren, B. H. Taxidermy. How to Collect, Skin, Preserve and Mount Birds, etc. (Bull. No. 6, Dept. of Agric., State of Penna. 8vo, pp. 128, 1896.)

Wilson, Scott B., and A. H. Evans. Aves Hawaiienses: The Birds of the Sandwich Islands. Pt. VI, July, 1896.

Actes de la Société Scientifique du Chili. V, 4^e Livr., 1896.

American Journ. Sci., July-Sept., 1896.

American Naturalist, July-Sept., 1896.

Anales del Museo nacional de Montevideo, IV, 1896.

Annals of Scottish Nat. Hist., July, 1896.

Aquila, III, Nos. 1, 2, 1896.

Bulletin British Orn. Club, No. 37, 1896.

Bulletin of the Wilson Orn. Chapter of the Agassiz Assoc., Nos. 6-9, 1896.

Forest and Stream, XLVII, Nos. 1-13, 1896.

Medical Age, XIV, Nos. 11-17, 1896.

Journal Cincinnati Soc. Nat. Hist., XIX, No. 1, 1896.

Naturalist, The, Month. Journ. of Nat. Hist. for North of England, July-Sept., 1896.

Nidologist, The, III, Nos. 10-12, 1896.

Observer, The, VII, July-Oct., 1896.

Oregon Naturalist, III, Nos. 6, 7, 1896.

Ornis, VIII, Heft 4, 1896.

Ornithologische Jahrbuch, VII, Hefte 4, 5, 1896.

Ornithologische Monatsberichte, IV, Nos. 7-9, 1896.

Osprey, The, I, No. 1, Sept. 1896.

Ottawa Naturalist, X., Nos. 4, 5, 1896.

Our Animal Friends, XXXIII, Nos. 10, 11, XXXIV, No. 1, 1896.

Proceedings and Transactions of the Nova Scotia Institute of Science, IX, pt. 1, 1896.

Science, New Ser., III, Nos. 77-90, 1896.

Shooting and Fishing, XX, Nos. 9-21, 1896.

Yearbook U. S. Dept. of Agriculture for 1895.

Zoölogists, The, Nos. 235-237, 1896.

GENERAL NOTES.

Occurrence of the Wood Ibis (*Tantalus loculator*) in Bristol County, Massachusetts.—Mr. J. W. Critchley, of Providence, Rhode Island, writes me that “late in the afternoon of July 17, 1896, a woman came into the store with a Wood Ibis which her husband had shot that morning at a small mud pond in Seekonk, Massachusetts. It is a young bird but the primaries, secondaries and tail have the black and greenish brown of the adult. The rest of the wings with the back are white. The head is bald but the neck is covered with dark, downy feathers.”

This specimen proved, on dissection, to be a male. Mr. Critchley has mounted it and I have just purchased it of him for my New England collection.—WILLIAM BREWSTER, *Cambridge, Mass.*

Wilson's Snipe in Nova Scotia in Winter.—During the months of January and February, 1896, I frequently flushed a pair of Wilson's Snipe (*Gallinago delicata*) from a small fresh-water swamp near this town, known as Willow Hollow. This swamp is watered by many springs, situated in a well sheltered place, and remains open all winter.

Is not this pretty far north for these birds to winter? The winter was severe with much snow.—HAROLD F. TUFTS, *Wolfville, Nova Scotia.*

The Wild Pigeon at Englewood, N. J.—Mr. C. Irving Wood permits me to record his capture of a Wild Pigeon (*Ectopistes migratorius*) at Englewood, N. J., June 23, 1896. The bird was alone. It has been mounted by Mr. J. Ullrich, a local taxidermist, in whose possession I saw it. It is a young female molting from the first into mature plumage.—FRANK M. CHAPMAN, *American Museum of Natural History, New York City.*

Recent Record of the Passenger Pigeon in Southern Wisconsin.—On September 8, 1896, I was fortunate enough to be presented with a beautiful immature male Passenger Pigeon (*Ectopistes migratorius*) which was killed that afternoon by a local hunter. It was a single bird and was shot from a dead tree near Delavan Lake; the crop was well filled with acorns and grasshoppers. This is the first record of the capture of the Wild Pigeon here in many years, and I consider myself extremely lucky in obtaining so fine a specimen.—N. HOLLISTER, *Delavan, Wis.*

The Turkey Vulture in the Catskills.—Dr. H. H. Rusby informs me that on September 1, 1896, he saw a Turkey Vulture (*Cathartes aura*) at Ulsterville, Ulster County, N. Y. The bird at one time was sailing

about within twenty yards of a number of observers, some of whom were familiar with the species in the South.—FRANK M. CHAPMAN, *American Museum of Natural History, New York City.*

Buteo borealis harlani in Minnesota.—On April 12, 1893, I secured a beautiful specimen of this Hawk on the prairies of Lac Qui Parle County, near Madison, this State. Mr. Robert Ridgway has examined it and pronounced it not quite adult. He considers this the most northern capture of this species. The following are the data: No. 1500. Collection Albert Lano. Length, 22.50; extent, 54.00; wing, 21.00; tail, 10.00 inches. Weight, 2 lbs. 12 1-2 oz. Ovaries size of no. 4 shot. Stomach empty.—ALBERT LANO, *Aitkin, Minn.*

A Note on Buteo borealis lucasanus Ridgway.—This form is usually cited as a 'var.,' and occurs as such in both the old and new A. O. U. Check-Lists, where it is based on "*Buteo borealis* var. *lucasanus* Ridgw. in Coues's Key, 1872, 216." The only reference to this bird at the place cited is: "An unpublished variety from Cape St. Lucas is *B. lucasanus* Ridgway, Mss." It will be noticed, first, that Dr. Coues names the form as a species; second, that the name is a manuscript one, hence under the new practice should be credited to Coues if otherwise correct; third, there is no description, unless the words "Cape St. Lucas" be considered such, which would hardly be justified under either of the three bases given in Canon XLIII of the Code. The correct citation appears to be, Ridgw. in Hist. N. Am. B. III, 1874, 258, 285.—WILLIAM PALMER, *Washington, D. C.*

Feeding-habits of Purple Finches.—The following interesting observations on the manner in which Purple Finches (*Carpodacus purpureus*) feed their young are communicated by Mrs. A. C. Davenport, of Brattleboro, Vt. She writes: "During the time the young were in the nest the parents came continually to my window for hemp seed, eating rapidly for ten minutes at a time. They then usually sipped a little water, flew away, and returned in a few moments.

"As soon as the young left the nest, they were brought to my window, and until they could care for themselves, or until a new brood was raised, were still fed by the food being ejected from the crops of the parent birds.

"I never saw any live food given them, though I watched closely, but of course I cannot say decidedly of this. Neither did I see the old birds 'budding' any during this period."—FRANK M. CHAPMAN, *American Museum of Natural History, New York City.*

First Occurrence of the Blue Grosbeak in New Hampshire.—On May 26, 1894, an adult male Blue Grosbeak (*Guiraca caerulea*), in full plumage, was seen near the house for about twenty minutes; I succeeded in getting within ten feet of the bird, so that I could see all the markings

distinctly without the aid of a glass. I had no means of securing the specimen, but there can be, I think, no doubt as to the identification.

The probability that this was an escaped cage bird at once suggests itself, but it is safe to say that the bird did not belong to anyone in this town or immediate neighborhood. Moreover, the feet and plumage seemed in too good condition for a newly escaped captive.¹—MABEL C. BERRY, *East Derry, N. H.*

Solitary Vireo (*Vireo solitarius*) nesting in Connecticut.—June 8, 1894, I found a nest of this species suspended from an alder bush, seven feet from the ground, in a swamp, near West Simsbury, Conn. It contained four eggs.—C. M. CASE, *Hartford, Conn.*

Dendroica palmarum in New York City.—An individual of the Palm Warbler was seen by the writer, September 2, 1896, in West 129th Street, New York City, at the base of the prominence upon which stands the Claremont Hotel. The bird is not only rare in this vicinity but the record is an unusually early one. Three of the five recorded instances of its occurrence are based on spring captures at Sing Sing (Fisher) and Riverdale (Bicknell). The two previous fall records are, Fire Island Light, L. I., Sept. 23, 1887 (Dutcher) and Red Bank, N. J., Sept. 28, 1889 (Oberholser).—FRANK M. CHAPMAN, *American Museum of Natural History, New York City.*

Breeding of the Yellow-throated Warbler (*Dendroica dominica*) in Virginia, near Washington.—Since 1889 (Auk, 1889, p. 339), this species has been frequently taken in Alexandria County in July and August. The writer has also taken it in Fairfax County, near Mount Vernon (May 13, 1894; June 4, 1893; June 11, 1893), and has often observed others. He has now to record that Mr. Stephan Rocyski, of Washington, took a set of five eggs on May 2, 1896, about a mile north of Mount Vernon. The nest was found on April 19, about one-fourth built, and was situated on a sloping branch on the south side of a cedar, twelve feet from the ground and forty feet from the south corner of a farmer's porch. It is composed of bits of bark, old grass stems and leaves, small vine tendrils, pieces of string and masses of spider webs. The rim is made of grass stems and the opening is thickly studded with white and gray feathers, so that little of the cavity is seen. Exteriorly it is cup-shaped, four inches deep by three in diameter, and hollowed where it rested on the sloping branch. This is probably the most northern record for the nesting of this species. Mr. Rocyski secured the female and kindly presented it to me.—WILLIAM PALMER, *Washington, D. C.*

¹ Previous New England records are: Boardman (Proc. Boston Soc. N. H., IX, 1862, p. 127), near Calais, Me.; Plummer (Bull. N. O. C., V, 1880, p. 184), Brookline, Mass.; and the Grand Menan, N. B., record by Herrick.

The Louisiana Water-Thrush Breeding in Berkshire County, Mass.—On the eleventh of June, 1896, I found a pair of Louisiana Water-Thrushes (*Seiurus motacilla*) feeding fledged young, near a clear mountain brook in Sheffield, Berkshire Co., Mass.—WALTER FAXON, *Museum of Comparative Zoölogy, Cambridge, Mass.*

The Mockingbird (*Mimus polyglottos*) in Canada.—A young Mockingbird taken in the fall of 1894 and sent to me from Sable Island, Nova Scotia, constitutes the fifth record of this species for Canada. The other four are so scattered and have been so often incompletely quoted it seems worth while to review them here. They stand as follows:

I. Strathroy, Ont. (Strathroy Age [newspaper], July 1, 1880; Forest and Stream, XV, Aug. 26, 1880, p. 67; Bull. N. O. C., VI, 1881, p. 112). A single bird was seen in the town but not captured.

II. Chatham, Ont. (Morden and Saunders, Canadian Sportsman and Naturalist, II, Nov. 1882, p. 184; Chamberlain, Cat. Canadian Birds, 1887, p. 110; McIlwraith, Birds of Ontario, revised ed., 1894, p. 388; Piers, Trans. N. S. Inst. Nat. Sci., I, ser. 2, pt. iv, 1895, p. 409).

In point of time, 1860, this is the first Mockingbird taken in Canada. Mr. Edwin W. Sandys, who originally furnished the record, was recently seen by the writer, and he tells me the bird was secured by his father and is now in a collection of stuffed birds made by him. It was seen perched on the ridge pole of a barn one June morning just after a warm southerly gale, and its rich song was what first drew attention to it.

III. Hamilton, Ont. (McIlwraith, Birds of Ontario, 1886, p. 284, revised ed., 1894, p. 388; Chamberlain, Cat. Canadian Birds, 1887, p. 110; Piers, Trans. N. S. Inst. Sci., I, ser. 2, pt. iv, 1895, p. 409). A pair of birds spent the summer of 1883 at East Hamilton.

IV. Truro, N. S. (McLennan, Orn. and OöL., XIV, Aug. 1889, p. 126; Piers, Trans. N. S. Inst. Nat. Sci., I, ser. 2, pt. iv, pp. 408-410). A bird was wounded and caught alive July 1, 1889. It showed no signs of being an escaped cage bird. Then it was put in a cage, where it lived for three years when it died and was thrown away.

V. Sable Island, N. S. This is a young bird in much worn first plumage, taken in the fall of 1894. I have been unable to obtain any information about the specimen except that it did not come to the island in a cage, and we can only assume it was carried thither by some resistless storm, perhaps from the mainland or more likely from some far more southern home.—JONATHAN DWIGHT, JR., *New York City.*

Thriothorus or Thryothorus?—I am interested in Mr. William Palmer's 'Thoughts on the New Check-List,' which suggests some thoughts in me. One of these thoughts is, that Mr. Palmer's criticisms are perfectly candid and sincere, and, therefore, should not be taken *de haut en bas*, but welcomed for anything they offer for the bettering of the Committee's performance. Another thought suggested is, that sometimes

Mr. Palmer is right, sometimes he is wrong, and sometimes he is just 'betwixt and between.' Take the case of the genus whose name, in two forms, heads this paragraph. Mr. Palmer says truly that Vieillot wrote the word *Thryothorus*; for so it appears on p. 45 of my well-thumbed copy of his 'Analyse,' 1816, though this is the page which the A. O. U. Committee cite for *Thryothorus*. But if Mr. Palmer had looked further into Vieillot's 'Analyse,' he would have found *Thryothorus* tucked away near the bottom of the right hand column of p. 70, in an alphabetical list of the new genera of the book, where the etymologies are given. There the etymon of the first element of the word is stated as 'θύρον, *juncus*'; and as the correct form resulting is *Thryothorus*, I think the Committee can defend their use of it, though they may have to cite p. 70 instead of p. 45 for it. At the same time, it offers a nice case for hair-splitting; for the previous *Thriothonus* of p. 45 cannot be brushed aside as a "typographical error," since Vieillot makes his intention clear by there writing 'THRIOTHORE, *Thriothonus*.' I commend the case to nomenclatural casuists.

While on the genus *Thryothorus*, I may inquire further how it happens that we have changed the name of *T. bewickii leucogaster* (Baird, 1864) to *T. b. bairdi* (Ridgway, 1885). The fact that there is a *Troglodytes leucogastra*, Gould, P. Z. S., 1836, p. 89 (which Baird mistook for the subspecies of *Thryothorus bewickii* which he named *leucogaster* in Rev. A. B., 1864, p. 127) does not affect the case one way or another. Gould's bird is now *Uropsila leucogastra*; it is also *Cyphorhinus pusillus* of Sclater, *Heterhina pusilla* of Baird, etc., and this cannot outlaw the use of the name *leucogaster* in the genus *Thryothorus*. Bewick's Wren has never been referred to the genus *Troglodytes* since one of its subspecies was called *leucogaster*, and of course there is no rule of nomenclature, express or implied, which requires us to change a specific name in one genus for the reason that the same has been used in another genus. Parity of reasoning—or rather, of unreasoning—would require us to reject *Cistothorus marianæ*, because there was a prior *Troglodytes marianæ*. I submit, therefore, that *Thryothorus bewickii bairdi*, No. 7196 of the A. O. U. Lists, 1886 and 1895, should stand as *T. b. leucogaster*.—ELLIOT COUES, *Washington, D. C.*

The Hudsonian Chickadee breeding in Southern Vermont.—On June 29, 1895, I found two Hudsonian Chickadees (*Parus hudsonicus*) and one Black-poll Warbler (*Dendroica striata*) on the summit of Stratton Mountain in southern Vermont. According to the U. S. Geological Survey the altitude of Stratton Mountain is 3859 feet, and these birds were observed at an altitude of about 3800 feet. The latitude is about 43° 6'—26 miles north of the Massachusetts line. As far as I can learn, the Hudsonian Chickadee has never been recorded from as far south in the breeding season. The Black-poll Warbler has been found by Mr. Bicknell and others in the Catskills, but I can find no other more southern record for it.—FRANCIS H. ALLEN, *West Roxbury, Mass.*

The Hudsonian Chickadee (*Parus hudsonicus*), Red-breasted Nuthatch (*Sitta canadensis*), and Golden-crowned Kinglet (*Regulus satrapa*) in Plymouth County, Mass., in Summer.—While walking through some dense old-growth pine woods (*Pinus strobus* and *P. rigida*.) on June 5, 1896, I was greeted by the snarl *chee-dè-e-e-e-ah* of a Hudson Bay Titmouse. In a few moments the bird, which was apparently alone, alighted within a few feet of me on a dead pine, and spent some time in exploring the cavities of a broken limb, from which he drew several lively white larvæ, one of them so large that it was swallowed with seeming difficulty but evident relish. The characteristic note was frequently uttered while feeding, but was sometimes shortened to *dee-e-e-yàh*. The bird then flew to a high pitch pine, and I did not see him again, though I heard him several times.

The woods in which I saw the Chickadee were only a few rods from a large cedar swamp, said to be a couple of miles wide, which is seldom visited except by lumbermen in winter; and in many portions the original growth of huge white cedars (*Cupressus thyoides*) and hemlock (*Abies canadensis*) has never been cut. In this old timber one seems to be in northern Maine or New Hampshire, instead of in Massachusetts;—the subdued half twilight of the damp cool forest, with its rocks and fallen trees, covered with a rich carpet of green moss and ferns might well tempt this and other northern birds to make it their summer home.

I saw nothing more of the Chickadee however; but throughout June and July Brown Creepers (*Certhia familiaris americana*) were quite often seen in the swamp; the Hairy Woodpecker (*Dryobates villosus*) outnumbered the smaller Downy (*D. pubescens*); and at least two pairs of Golden-crowned Kinglets (*Regulus satrapa*) spent the summer, newly fledged young being noted during the first week in August. One, and I think several, pairs of Red-breasted Nuthatches (*Sitta canadensis*) evidently nested here also, though I failed to find the nest; and fresh 'peck-holes', as well as the local lumbermen, testified to the presence of the Pileated Woodpecker (*Ceophlæus pileatus*) during the past year¹.—ARTHUR P. CHADBOURNE, M. D., Boston, Mass.

¹ In Massachusetts, the Hudsonian Chickadee has been recorded only during the winter and early spring.

Although the Brown Creeper, "has been twice found nesting in eastern Massachusetts and once at Springfield, its normal summer range is limited very strictly to the Canadian fauna. It breeds regularly on Mt. Graylock in western Massachusetts" (Brewster, in Minot's Birds of New England, second edition, 1895, p. 66).

Regulus satrapa has been found breeding "in the higher portions of Berkshire and Worcester Counties, Massachusetts. A single well-authenticated nest has been taken at Lynn, Massachusetts" (Brewster, loc. cit., p. 52).

Sitta canadensis, like the Kinglet, breeds in "Berkshire and Worcester Counties, Mass." (Brewster, loc. cit., p. 64).

The Pileated Woodpecker is now so unusual in eastern Massachusetts as to be almost a straggler.

The Western Martin and the California Cuckoo at Escondido, Calif.—On June 11, 1896, three or four pairs of black, swallow-like birds were seen flying swiftly about, and were seen to alight occasionally upon the eaves of the college building of that place. On June 12 I was fortunate enough to secure an adult female, which proved to be *Progne subis hesperia*. This bird had a soft-shelled egg in her oviduct.

August 20, while out hunting for a Road-runner, I saw a bird that was new to me. It seemed very tame and had a long tail, similar to a Dove, but the flight was quite slow and resembled that of a Sparrow Hawk. It proved to be a fine male *Coccyzus americanus occidentalis* and measured as follows: Length, about 12.50 inches; wing, 7.00; tail, 6.00; bill 1.00. Iris hazel. This specimen was taken among sumac bushes on a foothill. On Aug. 22 another bird of the same species was noted.—J. MAURICE HATCH, *Escondido, Calif.*

Bird Notes from Toronto, Canada.—Somateria spectabilis. KING EIDER.—Nov. 18, 1895, I took an adult male of this species in the most perfect mature plumage I have ever seen. The bird was alone and very wild. Immature birds of this species are not uncommon late in the autumn on Lake Ontario, but adult birds are extremely rare.

Porzana noveboracensis. YELLOW RAIL.—Sept. 12, 1894, I took a female in the marshes east of Toronto, and a male at the same place, Sept. 4, 1895; also a specimen on Oct. 3, and still another on Oct. 15, of the same year.

I have never succeeded in finding this species in the spring, nor in summer before the month of August.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—On August 29, 1891, I found and secured an adult female of this species in an old field north of Toronto, the bird was a long distance from any marsh or water. On June 7, 1895, I captured an adult male in a wet meadow east of Toronto. There were no rushes near this place but the grass was very rank.—C. W. NASH, *Toronto, Canada.*

Iridescence of Feathers, as explained by an Old Author.—The modern theory that the play of colors seen in some feathers is due to the action of minute irregularities on the surface of the barbs and barbules, composing the vane, which, like a multitude of small prisms, split up the light into differently colored rays, was proposed more than two hundred years ago.

In 1666, Robert Boyle, the chief instigator and one of the most active members of the Royal Society, published a book on 'The Causes of Colors'¹ in which he treats the subject chiefly from a chemical and

¹ Experiments | and | Considerations | Touching | Colours | . . . (Three lines). The | Beginning | Of An | Experimental History | Of | Colours. || By the Honourable Robert Boyle, | Fellow of the Royal Society. | . . . (Motto). London, | Printed for Henry Herringman at the | Anchor in the Lower walk of the New | Exchange. MDCLXIV.

physical standpoint. After ascribing the play of colors in various objects to the physical action of structural differences on the light, not to the coloring matter of the part, he speaks of the prismatic colors seen in certain feathers when examined against a strong light (p. 244, 245); and also states that the wonderful revelations of the microscope, then in its infancy, would doubtless show in such feathers minute prism-like structures as the cause of the iridescence—an interesting prophecy in the light of our present knowledge.—ARTHUR P. CHADBOURNE, *Boston, Mass.*

Birds Killed by a Storm.—About 11 o'clock P.M., on August 3, a terrific electric storm, accompanied by hail and wind, struck this city. Next morning the streets around the public parks and residence portions were literally covered with dead English Sparrows and a few Robins and other small birds. On one block in the residence portion of the city there were, by actual count, six hundred and twenty-two dead Sparrows, and one Robin. The nests containing eggs and young were blown down, and birds not killed by the fall were killed by the hail. Most of the old birds escaped, but the young, from just hatched to a couple of months old, were mostly killed, and had to be raked off the lawns and gathered up by street sweepers. A few more such storms would rid us of the detestable Sparrow.—WALTER I. MITCHELL, *St. Paul, Minn.*

NOTES AND NEWS.

THOMAS LYTTLETON, LORD LILFORD, late President of the British Ornithologists' Union, and Corresponding Member of the American Ornithologists' Union, died at Lilford Hall, Oundle, Northamptonshire, England, June 17, 1896, at the age of 63 years. He was one of the founders of the British Ornithologists' Union, and a prominent contributor to the early volumes of 'The Ibis.' Among his larger works are his 'Birds of Northamptonshire,' and 'Illustrations of British Birds.' He was enthusiastically interested in Hawking and in the study of live birds, his extensive aviaries containing many different kinds of Birds of Prey, Storks, Ibises, Herons, and Water-fowl. "His loss," says 'The Zoologist,' "will be deplored, not only by the learned societies of which he was so distinguished a member, but by a very large circle of friends and acquaintances to whom he had endeared himself by an unflinching kindness of heart and constant readiness to help."

EUGENE CARLETON THURBER, an Associate Member of the American Ornithologists' Union, died at Alhambra, California, on September 6, 1896, at the age of thirty-one years. Mr. Thurber will be known to the readers of 'The Auk' chiefly through his excellent 'List of the Birds of Morris County, New Jersey,' reviewed in the fifth volume of this journal (1888, p. 421). Shortly after its publication he removed to California, where he hoped to actively continue his ornithological pursuits. He was a careful observer and skilled collector, ever ambitious to win the esteem of his fellow-workers, but failing health so handicapped his efforts that he was never able to do justice to his own high aspirations. During the past two years he has lived an out-of-door life in the field, collecting birds and mammals, as his health would permit, and preserving to the end his love for his favorite study.

DR. GEORGE BROWN GOODE, Assistant Secretary of the Smithsonian Institution and Curator of the U. S. National Museum, died suddenly of pneumonia at his home in Washington on September 6, 1896, at the age of 45 years. Although Dr. Goode was not an ornithologist, through his position for nine years as Assistant Secretary of the Smithsonian Institution, in charge of the National Museum, ornithology, in common with other branches of natural history, is deeply indebted to him for his liberality in promoting its interests. As a personal friend and adviser, he was so well-known, not only to ornithologists, but to investigators in all branches of zoölogy, that a few words *in memoriam* of this distinguished naturalist are particularly fitting in the pages of 'The Auk.' Dr. Goode was especially eminent as an ichthyologist, and is the author of a long list of important papers and standard works on the fishes and fishing industries of North America; his last work, 'Oceanic Ichthyology,' written in conjunction with Dr. Tarleton H. Bean, was published only shortly before his death. He combined in rare degree administrative ability with talent as a scientific investigator, and a charming personality that easily smoothed the way to success in whatever he undertook. As a museum director he was doubtless without a peer, and had justly a world-wide reputation as an expert in all matters of museum administration. Stricken down thus suddenly in the prime of life and at the height of his usefulness, his loss to science, and especially to the National Museum, with which he had been officially connected for twenty-three years, seems well-nigh irreparable. When his predecessor in office, the late Professor Baird, passed away, Goode proved to be the man pre-eminently fitted to take up his official duties and carry on his work. But where can be found a man so perfectly equipped to bear the mantle of Goode?

THE question of establishing a Bird Day in the schools has been made the subject of a special circular (No. 17) by the Biological Survey of the Department of Agriculture. The plan suggested cannot be too heartily endorsed; its adoption throughout the land would be an inestimable

benefit. Not alone would children learn to know something of the interest and pleasure attached to study of birds, and of their economic value, but they would be brought in touch with nature in a manner which could not fail to arouse their best instincts.

The matter is very forcibly put in a letter from the Hon. J. Sterling Morton, Secretary of Agriculture. He writes: " . . . the study of birds tends to develop some of the best attributes and impulses of our natures. Among them we find examples of generosity, unselfish devotion, of the love of mother for offspring and other estimable qualities. Their industry, patience, and ingenuity excite our admiration; their songs inspire us with a love of music and poetry; their beautiful plumages and graceful manners appeal to our esthetic sense; their long migrations to distant lands stimulate our imaginations and tempt us to inquire into the causes of these periodic movements, and finally, the endless modifications of form and habits by which they are enabled to live under most diverse conditions of food and climate—on land and at sea—invite the student of nature into inexhaustible fields of pleasurable research."

MR. JAMES M. SOUTHWICK, well-known as a commercial naturalist, has recently been appointed Curator of the Museum of Natural History, lately established by the authorities of the city of Providence R. I., in Roger Williams Park. A building has been erected at a cost of \$40,000, a portion of which will be devoted to museum purposes, as required.

It is Mr. Southwick's intention to make the collections under his care instructive, as well as attractive and popular. To this end he will devote especial efforts to securing representative collections of the local fauna and later to the formation of small loan collections which can be used by teachers in their class-rooms. Much valuable material is already available for general exhibition.

THE first number of 'The Osprey, an Illustrated Monthly Magazine of Ornithology,' bears date September, 1896. It is a royal octavo of 16 pages, tastefully arranged and well printed, with numerous photographic illustrations, including a full-page half-tone plate of the nest of the Ferrugineous Rough-legged Buzzard, with papers by well-known ornithologists. There is doubtless plenty of room for a journal like 'The Osprey,' and we trust it will meet with the cordial support its opening number so well merits. It is edited by Walter A. Johnson and Dr. A. C. Murchison, with the office of publication at 217 Main Street, Galesburg, Ill.

THE GERMAN ZOÖLOGICAL SOCIETY has undertaken the gigantic task of publishing a systematic work on zoölogy, under the title 'Das Tierreich. Eine Zusammenstellung und Kennzeichnung der rezenten Tierfür men.' This immense work, it is thought, will require nearly one hun-

dred large 8vo volumes of about 800 pages each. The general editorship has been undertaken by Prof. F. E. Schulze, of Berlin, and the publication by Messrs. R. Friedländer and Son. According to the prospectus the Class Aves has been assigned to able hands. For example, it is announced that Graf Hans von Berlepsch will write the parts relating to the Icteridæ, Tanagridæ, Dendrocolaptidæ, and Tyrannidæ; Mr. Ernst Hartert, those relating to the Micropodidæ, Trochilidæ, Caprimulgidæ, and Podargidæ; Mr. Ogilvie-Grant, the Phasianidæ; Dr. Reichenow, the Sturnidæ, Ploceidæ, and Psittacidæ; Mr. L. W. Rothschild, the Paradiseidæ; Dr. R. B. Sharpe, the Vulturidæ, Falconidæ, and the Strigidæ.

The work will comprise the synonymy, short descriptions, and geographical range of every known species of animal, with diagnoses of the higher groups, etc. A 'Probe-Lieferung,' by Dr. O. Bütschli, of the Heliozoa, has been issued. The arrangement of the matter, in respect to typography, is excellent, and the general make-up is very attractive. Orders for the work should be addressed to R. Friedländer and Sohn, Carlstrasse, 11. Berlin, N. W.

MISS FLORENCE A. MERRIAM's papers on 'How Birds Affect the Farm and Garden,' noticed in this issue, have been republished by the 'Forest and Stream' Publishing Company as a 32-page pamphlet, which can be procured of the publishers (318 Broadway, New York City) at the nominal price of five cents per copy; special prices being made to individuals or Bird Protection Societies, who may wish it in quantities for distribution.

WE LEARN that the concluding 'Part IV' of Professor Alfred Newton's excellent 'Dictionary of Birds' is already in press, and that its early publication may be expected.

AS WE go to press we are in receipt of Volume XXIV of the British Museum 'Catalogue of Birds,' containing the Limicolæ, by Dr. R. Bowdler Sharpe. It forms a thick volume of over 800 pages, with seven colored plates.

WE ARE also pleased to announce the appearance of the second part of Captain Bendire's 'Life Histories of North American Birds,'—a volume of 500 pages and seven plates, containing about 200 figures. It includes the species from the Parrots to the Grackles.

INDEX TO VOLUME XIII.

- ACANTHIS* linaria rostrata, 245.
Acanthiza pusilla, 44.
Accipiter cooperii, 212, 293.
 velox, 177.
Actitis macularia, 215, 281, 292.
Ægialitis meloda circumcincta, 256.
 panirensis, 331.
 thoracica, 331.
 vocifera, 215, 281.
Agelaius phœniceus, 4, 212, 221, 242, 294.
Aix sponsa, 199, 215.
Alauda arvensis, 303.
 Allen, Francis H., the Hudsonian Chickadee breeding in southern Vermont, 345.
 Allen, J. A., note on the taxonomic value of the tongue in birds, 114; Gätke's 'Heligoland', 137; notice of his paper on 'Alleged Changes of Color in the Feathers of Birds without Molting', 166; comment on 'Some questions of Nomenclature', 187; comment on 'A question of Nomenclature', 191; [zoölogical nomenclature], 269.
Amazilia alice, 333.
 Ameghino, Florentino, notice of his 'Sur les Oiseaux Fossiles de Patagonie', 61.
 American Ornithologists' Union, Thirteenth Congress of, 55; Check-List of North American Birds, Second Edition, noticed, 69; Committee on Protection of Birds, report of, 98.
Ammodramus caudacutus, 271, 275.
 caudacutus becki, 273.
 caudacutus nelsoni, 245, 272, 273, 275.
 caudacutus subvirgatus, 273, 276.
 leconteii, 207, 208, 214.
Ammodramus sandwichensis savanna, 241, 283, 292, 294.
 savannarum passerinus, 294.
Ampelis cedrorum, 114, 213, 284, 295.
Anas boschas, 200.
 carolinensis, 215.
 chlorotis, 162.
 erythrophthalma, 170.
 maculosa, 162.
 obscura, 182, 199.
 penelope, 255.
 scutulata, 162.
 strepera, 201.
Anser albifrons gambeli, 162.
 anser, 164.
 fabalis, 244.
 ferus, 164.
 sandvicensis, 162.
 segetum, 244.
 Anthony, A. W., a new subspecies of the genus *Dryobates*, 31; *Puffinus tenuirostris* off San Diego, California, 171; *Clangula hyemalis* at San Diego, California, 172; the Black-vented Shearwater (*Puffinus opisthomelas*), 223; the Road-runner as a rat-killer, 257.
Anthus pensilvanicus, 214.
Antrostomus carolinensis, 214.
 vociferus, 282.
Aphelocoma californica, 120.
 couchi, 36, 37.
 gracilis, 34.
Aquila chrysaëtos, 81, 82, 256.
 glaucopis, 266.
Ardea cœrulea, 215.
 egretta, 178, 215.
 occidentalis, 172.
 tricolor ruficollis, 215.
 virescens, 215, 281, 292.
Ardetta exilis, 11.
 neoxena, 11, 59, 79.
Arenaria interpres, 181.

- Asarcornis, 162.
 scutulata, 162.
- Asio accipitrinus, 88, 257.
- Aythya, 162.
 affinis, 202, 215.
 americana, 201.
 collaris, 202, 215.
 marila, 202.
 marila nearetica, 162.
 vallisneria, 89, 201.
- BAILY, WM. L., Western Sandpiper (*Ereunetes occidentalis*) more abundant than the Semipalmated (*E. pusillus*), 174; summer birds of Northern Elk County, Pa., 289.
- Baker, Carl F., an important factor in the study of western bird-life, 20.
- Ball, Helen A., *Pinicola enucleator* at Worcester, Mass., 259.
- Barbour, Erwin H., the occurrence in Nebraska of *Vireo flavoviridis*, 263.
- Bartramia longicauda, 89.
- Basket, James Newton, intergradation in song of *Sturnella magna* and *S. m. neglecta* in Missouri, 258.
- Beal, F. E. L., notice of his paper on 'The Meadowlark and Baltimore Oriole', 336.
- Beddard, Frank E., notice of his 'Text-book of Zoögeography', 73.
- Belding, L., songs of the Western Meadowlark, 29.
- Bendire, Charles, notice of his paper on 'The Cowbirds,' 71.
- Berier, DeLagnel, the Pine Grosbeak in New Jersey, 175.
- Bernicla nigrescens, 4.
- Berry, Mabel C., first occurrence of the Blue Grosbeak in New Hampshire, 342.
- Bishop, Louis B., descriptions of a new Horned Lark and a new Song Sparrow, with remarks on Sennett's Nighthawk, 129.
- Bittern, Cory's Least, 11, 79.
 Least, 11.
- Blackbird, 298, 307, 311.
 Brewer's, 120.
 Red-winged, 4, 221, 294.
 Rusty, 221.
 Yellow-headed, 120.
- Blackcap, 306, 311.
- Bluebird, 222, 238, 285, 297.
 Western, 124.
- Bluethroat, Red-spotted, 142.
- Bobolink, 158, 294.
- Bob-white, 221, 281.
- Bonasa umbellus, 281, 292.
- Botaurus lentiginosus, 215.
- Brackett, Foster H., the Belted Piping Plover in Massachusetts, 256; the Red-headed Woodpecker in eastern Massachusetts, 258.
- Braislin, William C., the Golden Eagle in New Jersey, 81; notes on Long Island birds, 87.
- Brant, Black, 4.
- Branta canadensis, 92.
- Brewster, William, descriptions of a new Warbler and a new Song Sparrow, 44; occurrence of the Wood Ibis (*Tantalus loculator*) in Bristol County, Mass., 341.
- Brock, Henry H., the King Rail again in Maine, 79; *Crymophilus fulcarius* in Maine, 173; *Crex crex* in Maine, 173; recent occurrence of the Florida Gallinule in southern Maine, 255; recent capture of the Golden Eagle near Portland, Maine, 256.
- Brown, Nathan Clifford, Baird's Sandpiper in Maine, 80; the Ipswich Sparrow—a correction, 84; the American Crossbill at sea, 176; second occurrence of the Blue-gray Gnatcatcher in Maine, 264.
- Browne, Montagu, notice of his 'Artistic and Scientific Taxidermy and Modelling,' etc., 247.
- Bruner, Lawrence, notice of his 'List of Nebraska Birds,' 245.
- Bubo arcticus, 154.
 pacificus, 154.
 subarcticus, 153.
 virginianus, 155, 293.
 virginianus arcticus, 156.
 virginianus occidentalis, 155.
 virginianus pacificus, 156.
 virginianus saturatus, 155, 257.
- Bucco bicinctus, 332.
- Buckley, T. E., see Harvie-Brown, J. A.
- Bunting, Indigo, 283, 291, 295.
 Lazuli, 121.
- Bush-tit, Californian, 123.
- Buteo borealis, 212, 293.

- Buteo borealis harlani*, 342.
 borealis lucasani, 342.
 lineatus, 222.
Butorides robinsoni, 333.
- Calcarius lapponicus*, 86.
Calidris arenaria, 215.
Callipepla californica vallicola, 81,
 116, 265.
 californica vallicola + *C. gambelii deserticola*, 265.
 gambelii, 185.
Callothrux robustus, 71.
Camarhynchus bindloei, 330.
 compressirostris, 330.
 incertus, 330.
Campephilus principalis, 213.
Cardinal, 218, 238.
Cardinalis cardinalis, 213, 218, 238.
 robinsoni, 333.
Carduelis carduelis, 238.
Carpodacus mexicanus frontalis,
 120.
 purpureus, 214, 222, 283, 291,
 292, 294, 342.
Casarca casarca, 164, 243.
 rutila, 164.
Case, C. M., Solitary Vireo (*Vireo solitarius*) nesting in Connecticut, 343.
Casuaris casuaris, 164.
 galeatus, 164.
Catbird, 218, 238, 285, 296, 335.
Cathartes aura, 116, 212, 222, 341.
Catharista atrata, 212.
Cedarbird, 283, 291, 295.
Ceophloeus pileatus, 213, 220, 346.
Certhia familiaris albescens, 315.
 familiaris alticola, 315, 316.
 familiaris americana, 213,
 220, 292, 296, 346.
 familiaris mexicana, 315, 316.
 mexicana, 315, 316.
 mexicana albescens, 315.
Ceryle alcyon, 238, 281.
Chadbourne, Arthur P., evidence suggestive of the occurrence of 'individual dichromatism' in *Megascops asio*, 321; the Hudsonian Chickadee (*Parus hudsonicus*), Red-breasted Nuthatch (*Sitta canadensis*), and Golden-crowned Kinglet (*Regulus satrapa*) in Plymouth County, Mass., in summer, 346; iridescence in feathers, as explained by an old author, 347.
Chætura pelagica, 82, 214, 282, 293.
Chaffinch, 302, 306.
Chamberlain, Montague, notice of his 'Common Birds of Eastern Canada,' 67.
Chamaea fasciata henshawi, 122.
Chapman, Frank M., the standing of *Ardetta neoxena*, 11; notice of his paper on 'The Changes of Plumage in the Dunlin and Sand-derling,' 164; notice of his paper 'On the Changes of Plumage in the Snowflake (*Plectrophenax nivalis*),' 165; the Turkey Vulture in the Catskills, 341; the Wild Pigeon at Englewood, N. J., 341; feeding habits of Purple Finches, 342; *Dendroica palmarum* in New York City, 343.
Charadrius dominicus, 80, 89, 91, 142.
 pluvialis, 146.
 squatarola, 181, 182.
Charitonetta, 163.
 albeola, 202, 215.
Chat, Yellow-breasted, 285.
Chelidon erythrogaster, 4, 214, 283, 295.
Chen hyperboreus, 193.
 hyperboreus nivalis, 161, 243.
 nivalis, 193.
Cherrie, George K., *Ardetta neoxena* from Wisconsin, 79; an apparently new *Chordeiles* from Costa Rica, 135; notice of his 'Contribution to the Ornithology of San Domingo,' 333.
Chewink, 178, 291, 294.
Chickadee, Black-capped, 220, 285, 297.
 Hudsonian, 345, 346.
Chloronerpes striatus, 333.
Chondestes grammacus, 84, 179.
 grammacus strigatus, 120.
Chordeiles acutipennis, 333.
 virginianus, 159, 215, 282.
 virginianus asseriensis, 136.
 virginianus sennetti, 134.
Cinclus aquaticus, 169.
Circus hudsonius, 212.
Cistothorus palustris, 242.
 stellaris, 194, 214, 347.
Clangula, 163.
 clangula, 164.
 clangula americana, 215.
 glaucion, 164.
 hyemalis, 164, 172, 202.

- Clivicola riparia*, 283.
Coccythraustes vespertinus, 259.
Coccyzus americanus, 259, 281, 333.
 americanus occidentalis, 347.
 erythrophthalmus, 212, 281.
 293.
 ferrugineus, 75.
Cocornis agassizi, 75.
Colaptes auratus, 212, 220, 281, 293.
 cafer, 85, 118.
Colinus virginianus, 215, 221.
Collocalia, 83, 114.
Columbigallina passerina terrestris,
 215.
Compsothlypis americana, 45, 214,
 283, 295.
 americana usnæ, 44.
 Comstock, F. M., the Parasitic
 Jaeger near Cleveland, Ohio,
 171.
Contopus borealis, 85, 282.
 richardsonii, 120.
 virens, 214, 282, 293.
 Cook, A. J., food of Woodpeckers
 and Flycatchers, 85.
 Cormorant, 312.
 Double-crested, 90.
Corvus americanus, 212, 283, 288,
 294.
 corax principalis, 83.
 Cory, Charles B., notice of his
 'Hunting and Fishing in Flor-
 ida', etc., 246.
Coscoroba candida, 163.
 coscoroba, 163.
Cosmonessa, 163.
Cotinga cuprea, 266.
 rubra, 266.
 Coues, Elliott, an early descrip-
 tion of *Phalacrocorax dilophus*,
 78; name of the Large-billed
 Puffin, 255; Merrem's Work,
 265; Mandt's Inaugural Disserta-
 tion, 266; *Thriothorus* or *Thryo-*
 thorus, 344.
 Covert, Adolphe B., Baird's Sand-
 piper in Michigan, 255.
 Cowbird, 283.
 Crane, Corn, 173.
Creagrus furcatus, 75.
 Creeper, Brown, 306, 346.
 Mexican, 315.
Crex crex, 173.
 Crossbill, American, 176, 179.
 White-winged, 210.
 Crow, 220, 283, 285, 337.
Crymophilus, 65.
Crymophilus fulcarius, 173.
 Cuckoo, Black-billed, 281, 293.
 California, 347.
 Yellow-billed, 281, 333.
 Curlew, Eskimo, 80, 89, 91, 182.
 Long-billed, 181.
 Pink, 209.
Cyanecula abbotti, 331.
 suecica, 142.
Cyanocitta cristata, 212, 221, 282,
 294.
Cygnus cygnus, 163.
 musicus, 163.
Cyphorinus pusillus, 345.
Cypseloides, 83.
Cypselus apus, 303.

 DAFILA *acuta*, 200.
 Davis, W. M., the soaring of birds
 and currents of air, 92.
 Deane, Ruthven, additional records
 of the Passenger Pigeon (*Ecto-*
 pistes migratorius) in Wisconsin
 and Illinois, 81; some notes on
 the Passenger Pigeon (*Ectopistes*
 migratorius) in confinement, 234;
 record of a fourth specimen of
 the European Widgeon (*Anas*
 penelope) in Indiana, 255.
 De Haven, I. N., Brünnich's Murre
 at Cape Charles, Virginia, 271.
 Delaware Valley Ornithological
 Club, 193.
Dendrocopos montanus, 190.
Dendroica æstiva, 214, 283, 295.
 auduboni, 121.
 aureola, 75.
 blackburniæ, 292, 296.
 cærulea, 179.
 cærulescens, 214, 242, 292,
 295.
 castanea, 88, 181.
 coronata, 214, 220.
 discolor, 214.
 dominica, 214, 343.
 maculosa, 283, 292, 295.
 palmarum, 181, 214, 343.
 palmarum hypochrysea, 214.
 pennsylvanica, 283, 292, 296.
 ruficapilla, 263.
 striata, 214, 345.
 tigrina, 84, 87, 181, 207, 214.
 vigorsii, 214.
 virens, 283, 292, 296.
Dendroplex longirostris, 333.
Diomedea chionoptera, 161.

- Diver, Great Northern, 77.
Doleromya pallida, 333.
Dolichonyx oryzivorus, 213, 294.
Dove, Carolina, 281.
 Turtle, 310.
Dowitcher, 180.
 Long-billed, 88, 180.
Dryobates borealis, 210, 213.
 major, 190.
 montanus, 191.
 pubescens, 213, 281, 293, 330, 346.
 pubescens meridionalis, 330.
 pubescens nelsoni, 330.
 villosus, 174, 281, 293, 346.
 villosus auduboni, 213.
 villosus harrisi, 34, 85.
 villosus hyloscopus, 34.
 villosus montanus, 32, 34, 190.
Dryolimnas aldabranus, 332.
Duck, Black, 182.
 Canvas-back, 90, 201.
 Dusky, 199.
 Harlequin, 78, 202, 229.
 Long-tailed, 202.
 Pintail, 200.
 Ringneck, 202.
 Ruddy, 203.
 Scaup, 202.
 Wood, 199.
Dulus dominicus, 333.
Dunlin, 150, 164.
Dutcher, William, *Chen hyperborea* and *C. nivalis*, 193.
Dwight, Jonathan, Jr., the Sharp-tailed Sparrow (*Ammodramus caudacutus*) and its geographical varieties, 271; the Mockingbird (*Mimus polyglottos*) in Canada, 344.
EAGLE, Golden, 256.
Eaton, Elan Howard, bird notes from Erie County, N. Y., 178.
Ectopistes migratorius, 4, 81, 215, 234, 290, 341.
Egret, American, 178.
Eider, American, 202.
 King, 203, 347.
Elainea cherriei, 334.
Elasmonetta, 162.
 chlorotis, 162.
Elliot, D. G., in memoriam: George Newbold Lawrence, 1; descriptions of an apparently new species and subspecies of Ptarmigan from the Aleutian Islands, 24; notice of his monograph of the Pittidae, 60; notice of his North American Shore Birds, 64; notice of his African expedition, 196, 268.
Emberiza citrinella, 303.
Empidonax difficilis, 85.
 minimus, 282, 292, 293.
 pusillus, 85.
Ereunetes occidentalis, 88, 174.
 pusillus, 174.
Erismatura æquatorialis, 162.
 jamaicensis, 163.
 rubida, 163, 203.
Erithacus rubecula, 300.
Eupsychortyx pallidus, 332, 333.
FALCO sparverius, 88, 212, 281, 293.
 sparverius deserticolus, 116.
Faxon, Walter, John Abbot's drawings of the birds of Georgia, 204; *Helminthophila rubricapilla* vs. *Helminthophila ruficapilla*, 263; the Louisiana Water-Thrush in Berkshire County, Mass., 344.
Ficedula ludoviciana, 44.
Finch, Grass, 291, 294.
 House, 120.
 Lark, 120.
 Lazuli, 120.
 Painted, 261.
 Purple, 222, 283, 294, 342.
Fisher, A. K., notice of his 'Hawks and Owls from the Standpoint of the Farmer,' 73;
Flicker, 280, 281, 293.
 Red-shafted, 118.
Flycatcher, Ash-throated, 119.
 Crested, 280, 282.
 Least, 282, 293.
 Olive-sided, 282.
 Scissor-tailed, 83.
Forbush, Edward H., notice of his remarks on 'The usefulness of Birds as Insect Destroyers,' 336; notice of his 'The Crow in Massachusetts,' 337.
Foster, L. S., *Pinicola enucleator* in Westchester County, N. Y., 175.
Fratercula arctica, 189.
 arctica glacialis, 185, 189.
Fringilla chlorura, 185, 188.
 caudacuta, 272.
 cælebs, 302.

- Fringilla iliaca, 266.
 littoralis, 272.
 Fulmarus glacialis, 162.
 glacialis glupischa, 162.
 glacialis minor, 162.
 glacialis rodgersii, 162.
 Furness, Caroline E., the Pine Gros-
 beak at Poughkeepsie, N. Y., 175.

 GADWALL, 201.
 Galeoscoptes carolinensis, 214, 219,
 238, 285, 296.
 Galeripitta, 60.
 cucullata, 60.
 Gallinago delicata, 215, 341.
 Gallinula galeata, 215, 255.
 Gallinule, Florida, 255.
 Ganong, W. F., do young Loons
 eat fresh-water clams? 77.
 Gaylord, Horace A., *Pyrocephalus*
 rubineus mexicanus in Los Ange-
 les County, Cal., 258; *Zonotrichia*
 albicollis and *Mniotilta varia* at
 Pasadena, Cal., 260.
 Gelochelidon anglica, 161.
 nilotica, 161, 215.
 Geococcyx californianus, 117, 257.
 Geospiza fatigata, 330.
 pachyrhynca, 330.
 Geothlypis flaveolatus, 331.
 philadelphia, 179.
 trichas, 214, 285, 296.
 Gilman, Arthur Scott, a Brown
 Thrasher (*Harporhynchus rufus*)
 in Massachusetts in winter, 176.
 Glaucion, 163.
 Glaucionetta, 163.
 clangula americana, 163, 202.
 islandica, 202.
 Gnat-catcher, Blue-gray, 264.
 Western, 123.
 Goldfinch, American, 283, 291, 294.
 European, 238.
 Golden-eye, 202.
 Barrow's, 202.
 Goode, George Brown, notice of
 death of, 349.
 Goosander, 203.
 Goose, Canada, 92.
 Grackle, Bronzed, 294.
 Purple, 283.
 Rusty, 221.
 Gracula chrysoptera, 266.
 nobilis, 266.
 Grosbeak, Black-headed, 120.
 Blue, 213, 342.
 Grosbeak, Evening, 259.
 Pine, 21, 58, 175, 176, 177,
 259, 266.
 Rose-breasted, 159, 241, 295.
 Grouse, Canadian Ruffed, 281.
 Ruffed, 126, 292.
 Grus mexicana, 68, 207, 215.
 Guara alba, 215.
 rubra, 207, 215.
 Guiraca cærulea, 213, 342.
 Gull, American Herring, 78, 88.
 Herring, 312.
 Laughing, 54.
 Little, 149.
 Mew, 168.
 Ring-billed, 182.
 Gundlach, Juan, biographical notice
 of, 267.

 HABIA ludoviciana, 292, 295.
 melanocephala, 120.
 Hæmatopus palliatus, 215.
 Hales, Henry, peculiar traits of
 some Scarlet Tanagers, 261.
 Haliæetus leucocephalus, 212.
 Harelda, 163.
 glacialis, 163.
 Harporhynchus redivivus, 121.
 rufus, 176, 213, 218, 285.
 Harvie-Brown, J. A., and T. E.
 Buckley, notice of their 'A Ver-
 tebrate Fauna of the Moray
 Basin,' 251.
 Hatch, J. Maurice, occurrence of
 the Great White Heron at Escon-
 dido, California, 172; the West-
 ern Martin and the California
 Cuckoo at Escondido, Cal., 347.
 Hawk, American Sparrow, 222, 293.
 Cooper's, 293.
 Desert Sparrow, 116.
 Red-shouldered, 222, 293,
 Sharp-shinned, 88, 281, 177.
 Headley, F. W., notice of his 'The
 Structure and Life of Birds,' 68.
 Helmintherus vermivorus, 213, 284.
 Helinaia swainsoni, 213.
 Helminthophila bachmani, 264.
 celata lutescens, 121.
 chrysoptera, 179.
 peregrina, 87.
 rubricapilla, 263.
 rubricapilla gutturalis, 264.
 ruficapilla, 263.
 Heron, Great White, 172.
 Green, 281, 291, 292.

- Heteractitis, 66.
Heterorhina pusilla, 345.
Hirundo puella, 114.
 rustica, 300.
 urbica, 302.
Histrionicus, 163.
 histrionicus, 78, 202, 229.
Hoffmann, Ralph, summer birds
 (July 15-Aug. 13, 1894) of the
 Rhine, 297.
Hollister, N., Evening Grosbeak in
 southern Wisconsin, 259; a recent
 record of the Passenger Pigeon
 in Wisconsin, 341.
Holzner, Frank Xavier, habits of
 the Valley Partridge, 81.
Howe, Reginald Heber, Jr., abnormal
 plumage of a Pine Grosbeak,
 176; three winter notes from
 Longwood, Mass., 178; notice of
 his 'Every Bird, a Guide to the
 Identification of the Birds of
 Woodland, Beach and Ocean,'
 247; four winter records of the
 Short-eared Owl on Massachusetts
 Coast, 257; the wintering of the
 Towhee at Longwood, Mass., 260;
 the Nonpareil at Longwood,
 Mass., 261; correction, 266.
Hudson, W. H., notice of his 'British
 Birds,' 70.
Hummingbird, Black-chinned, 118.
 Buff-breasted, 332.
 Ruby-throated, 282, 293.
 Rufous, 119.
Huxley, Thomas Henry, biographi-
 cal notice of, 93.
Hydrochelidon nigra, 160.
 nigra surinamensis, 216.
 surinamensis, 160.
Hyetornis fieldi, 334.
Hylophilus griseiceps, 333.

IBIS rubra, 209.
Ibis, Scarlet, 209.
 White-faced Glossy, 79.
 Wood, 341.
Icteria virens, 214, 285.
Icterus cucullatus nelsoni, 120.
 galbula, 283.
 parisorum, 265.
 spurius, 212.
Insignipitta, 60.
 elliotti, 60.
 gurneyi, 60.
Ionornis martinica, 215.

JAEGER, Parasitic, 171.
Jay, Blue, 221, 282, 294.
 California, 120.
Job, Herbert K., the Ducks of Ply-
 mouth County, Mass., 197.
Judd, Sylvester D., feeding habits
 of the English Sparrow and
 Crow, 285; notice of his paper
 'Four common Birds of the Farm
 and Garden,' 335.
Junco hyemalis, 178, 213, 218, 242,
 283, 292, 294.
 hyemalis oregonus, 245.
 oregonus, 183.
Junco, Slate-colored, 178, 218, 283.
Kent Ornithological Club, 98.
Killdeer, 215, 281.
Kingbird, 282, 291, 293.
 Cassin's, 119.
Kingfisher, Belted, 239, 281, 293.
Kinglet, Golden-crowned, 220, 346.
 Ruby-crowned, 220.
Kirkwood, F. C., notice of his 'List
 of the Birds of Maryland,' 67.
Knight, O. W., the Pine Grosbeak
 in captivity, 21; the Golden Eagle
 in Maine, 82; a few notes from
 Maine, 177;
Knot, 86, 91.

LAGOPUS evermanni, 25.
 leucurus, 186, 189.
 rupestris townsendi, 26.
Lanius atricapillus, 266.
 ludovicianus, 245.
 ludovicianus excubitorides,
 121.
Lano, Albert, *Olor buccinator* in
 western Minnesota, 78; *Buteo*
 borealis harlani in Minnesota, 342.
Lapwing, 311.
Lark, Horned, 181, 210.
 Hoyt's Horned, 130.
 Meadow, 229.
 Prairie Horned, 294.
Larus argentatus smithsonianus, 88.
 atricilla, 54, 215.
 Carrovianus, 161.
 canus, 168.
 delawarensis, 181.
 franklini, 186, 189, 207, 215.
Lawrence, George N., biographical
 notice of, 1.
Lawrence, Robert B., a new Long
 Island, N. Y., record for the Red-
 bellied Woodpecker (*Melanerpes*
 carolinus), 82.

- Leptotila insularis*, 333.
Lepus arcticus, 186, 190.
 glacialis, 186, 190.
Limosa fedoa, 215.
 Loomis, Leverett M., notice of his
 'California Water Birds, No. II,'
 168; do., No. III, 329.
 Loon, 90.
Lophodytes cucullatus, 203, 215, 220.
Loxia curvirostra minor, 176, 179.
 leucoptera, 207, 213.
 Lucas, Frederic A., notice of his
 'The Weapons and Wings of
 Birds,' 72; the deltoid muscle in
 the Swifts, 82; the taxonomic
 value of the tongue in birds, 109;
 the skull of the young Cormor-
 ant, 172; Notice of his paper on
 'Osteological and Pterylographi-
 cal Characters of the Procnia-
 tidæ,' 334.
 Lydekker, Richard, notice of the
 'Birds' of the 'Royal Natural
 History,' edited by, 156, 252.
 Lyttleton, Thomas, Lord Lilford,
 notice of death of, 348.

 MACKAY, George H., the Terns of
 Muskeget Island, Massachusetts,
 Part II, 47; 'Gull Dick' again,
 78; the 1895 migration of *Chara-
 drius dominicus* in Massachusetts,
 80; a correction, 86; Nantucket
 and Muskeget Island notes, 88;
 Gätke's Birds of Heligoland, 89;
 sundry notes, 182;
Macropteryx, 83.
 coronata, 114.
Macrorhamphus griseus, 180.
 scolopaceus, 88, 180.
 Magpie, European, 311.
 Mallard, 200.
Mareca americana, 200.
 Maris, Willard Lorraine, notice of
 death of, 193.
Marmon fratercula, 189.
 Martin, 302.
 House, 324.
 Purple, 283.
 Western, 347.
 Meadowlark, 4, 222, 258, 283, 294,
 335.
 Western, 29, 258.
Megalestris catarrhactes, 161.
 skua, 161.
Megascops asio, 321.

Melanerpes carolinus, 82, 213, 220.
 erythrocephalus, 213, 220,
 258, 293.
 formicivorus bairdii, 85, 117.
 torquatus, 85.
Meleagris gallopavo, 221.
Mellisuga coccinea, 266.
Melospiza fasciata, 114, 214, 218.
 242, 283, 294.
 fasciata juddi, 132.
 fasciata merrilli, 46.
 georgiana, 114, 218.
 lincolni, 87, 114.
Merganetta frænata, 162.
Merganser castor, 164.
 comatus, 162.
 merganser, 164, 203.
 serrator, 203.
Merganser, Hooded, 203.
 Red-breasted, 203.
Mergus albellus, 163.
 merganser, 220.
 serrator, 215.
Merops spiza, 226.
 Merriam, Florence A., nesting
 habits of *Phainopepla nitens* in
 California, 38; notes on some
 of the birds of Southern Cali-
 fornia, 115; notice of her 'How
 Birds affect the Farm and
 Garden', 337.
Merula merula intermedia, 331.
 migratoria, 213, 219, 285, 297.
 migratoria propinqua, 245.
 Michigan Ornithological Club, 194.
Micropalama himantopus, 88, 180.
Micropus, 83.
 Miller, Gerrit S.; Jr., description
 of a new Jay from Mexico, 34.
Milvulus forficatus, 68, 83.
Mimus polyglottos, 213, 239, 344.
 Mitchell, Walter I., birds killed by
 a storm, 348.
Mniotilta varia, 214, 260, 283, 295.
 Mockingbird, 167, 222, 237, 335, 344.
Molothrus ater, 71, 212, 283.
 badius, 72.
 bonariensis, 71.
 rufocollaris, 72.
 Montgomery, Thomas H., notice
 of his paper on migration of
 birds as a check upon geographi-
 cal variation, 335.
Mormon glacialis, 189.
 Morris, Robert O., rare visitors to
 the Connecticut River Valley in
 Massachusetts in 1895, 86;

- Motacilla alba*, 301.
 eques, 44.
 ludoviciana, 44.
 lugens, 240.
 pusilla, 44.
 torquata, 44.
- Mulliken, W. E., Baird's Sandpiper in Michigan, 174.
- Murre, Brünnich's, 171.
- Murrelet, Ancient, 168.
- Muscicapa ferruginea*, 266.
- Myiarchus cinerascens*, 85, 119.
 crinitus, 282.
 tyrannulus, 332.
- NASH, C. W., bird notes from Toronto, Canada, 347.
- Nesochen, 162.
 sandwichensis, 162.
- Nesocittes micromegas*, 333.
- Nesotriccus ridgwayi*, 75.
- Nighthawk, 160, 282.
 Sennett's, 134.
- Nonpareil, 261.
- Norton, Arthur H., recent observations on *Histrionicus histrionicus* in Maine, 229.
- Numenius borealis*, 80, 92, 182.
 longirostris, 215.
- Nuthatch, Red-breasted, 84, 346.
 White-breasted, 285, 297, 346.
- Nyctala acadica*, 292, 293.
- Nyctea nyctea*, 207, 213.
- Nycticorax nycticorax nævius*, 215.
 violaceus, 215.
- Nyroca africana*, 164.
 nyroca, 164.
- OBERHOLSER, Harry C., a question of nomenclature, 190; critical remarks on the Mexican forms of the genus *Certhia*, 314; notices of his paper on new subspecies of *Dryobates pubescens*, 330.
- Oceanodroma tristrami*, 161.
- Oidemia americana*, 89, 186, 189, 203.
 carbo, 163.
 deglandi, 88, 89.
 perspicillata, 89.
- Olor buccinator*, 78.
- Opisthocornus cristatus*, 72.
- Oriole, Arizona Hooded, 120.
 Baltimore, 158, 283, 336.
- Oriolus caudacutus*, 271.
- Ornatipitta*, 60.
 boschi, 60.
 guaiana, 60.
 schwaneri, 60.
- Ortalis vetula mcalli*, 253.
- Otocoris alpestris*, 181, 207, 210.
 alpestris arenicola, 130.
 alpestris hoyti, 130.
 alpestris leucolæma, 130.
 alpestris pallida, 185, 188.
 alpestris praticola, 130, 294.
- Ouzel, Water, 310.
- Ovenbird, 284, 296.
- Owl, American Barn, 117.
 Barred, 222, 293.
 Burrowing, 117.
 Dusky Horned, 257.
 Florida Burrowing, 99.
 Great Horned, 293.
 Saw-whet, 291, 293.
 Short-eared, 257.
 Screech, 321.
 Western Horned, 117.
- PALMER, William, the Scissor-tailed Flycatcher in Virginia and Maryland, 83; second occurrence of the Lark Sparrow in Virginia, 84; on the Florida Ground Owl (*Speotyto floridana*), 99; a note on *Buteo borealis lucasana* Ridgway, 342; breeding of the Yellow-throated Warbler (*Dendroica dominica*) in Virginia, near Washington, 343.
- Partridge, Valley, 81.
- Parus americanus*, 44.
 ater, 300.
 ater britannicus, 327.
 atricapillus, 285, 292, 297.
 bicolor, 214, 220.
 borealis, 336.
 britannicus, 327.
 carolinensis, 214, 220.
 cæruleus, 300.
 dresseri, 327.
 fringillaris, 44.
 hudsonicus, 345, 346.
 inornatus, 122.
 major, 300.
 palustris, 300, 327.
 palustris dresseri, 327.
- Passer domesticus*, 114.
- Passerculus sandwichensis savanna*, 214.
- Passerella iliaca*, 214, 217, 265.

- Passerina amœna*, 121.
 ciris, 261.
 cyanea, 213, 283, 295.
Pavoncella pugnax, 68.
Peabody-bird, 217.
Peabody, P. B., White-faced Glossy Ibis breeding in Minnesota, 79.
Pelecanoides exsul, 161.
Penelope iacupema, 266.
 leucolophos, 266.
Perisoreus infaustus, 158.
Petrochelidon lunifrons, 121, 295.
Peucedramus olivaceus aurantiacus, 330.
Pewee, Wood, 282, 293.
 Western Wood, 120.
Phaëthon flavirostris, 239.
Phainopepla nitens, 38, 265.
Phalacrocorax carbo, 312.
 dilophus, 78, 89, 90, 178.
 urile, 172.
Phalarope, Red, 173.
Phalaropus, 65.
Phasianus ignitus, 253.
Philohela minor, 215.
Phlegopsis saturata, 331.
Phœbe, 282, 293.
 Black, 120.
Phororhacos, 61, 62, 63.
 inflatus, 61.
 longissimus, 61.
Picus montanus, 190, 191.
Pigeon, Passenger, 4, 81, 234, 290, 341.
 Wild, 292, 341.
Pinicola enucleator, 21, 58, 175, 176, 177, 259.
Pipilo chlorurus, 185, 265.
 erythrophthalmus, 178, 213, 218, 260, 283, 294.
Piranga erythromelas, 214, 261, 283, 294.
 rubra, 213.
Pitta angolensis, 60.
 arcuata, 60.
 cucullata, 60.
 cyanonota, 60.
 forsteni, 60.
 inspeculata, 60.
 mackloti, 60.
 nympha, 60.
 oreas, 60.
 palliceps, 60.
 propinqua, 60.
 soror, 60.
 streptans, 60.
 vigorsii, 60.
Plectrophenax nivalis, 165, 242.
Plegadis guarauna, 79.
Plover, American Golden, 80, 89, 142.
 Black-bellied, 89, 181.
 Field, 291.
 Golden, 146.
 Killdeer, 281.
Podilymbus podiceps, 215.
Poliophtila cœrulea, 214, 264.
 cœrulea obscura, 123.
Poocætes gramineus, 214, 283, 294.
Porzana carolina, 207, 215.
 noveboracensis, 173, 179, 347.
Prentiss, D. Webster, notes on the birds of Bermuda, 237.
Priocella, 162.
Priotelus gracilis, 114.
Procnias, 334.
Procnatiadæ, 344.
Progne subis, 214, 283.
 subis hesperia, 347.
Protonotaria citrea, 214.
Psaltiriparus minimus californicus, 163.
Pteronetta, 162.
 hartlaubi, 162.
Publications Received, 76, 169, 253, 338.
Puffin, Large-billed, 255.
Puffinus auduboni, 161.
 borealis, 161.
 creatopus, 228.
 fuliginosus, 341.
 gavia, 161.
 gravis, 161.
 griseus, 161, 228.
 kuhli, 161.
 major, 161.
 opisthomelas, 161, 223.
 tenuirostris, 171.
Pulchripitta, 60.
 iris, 60.
Pyrocephalus rubineus mexicanus, 258.

 QUAIL, Valley, 116.
Querquedula circia, 164.
 hartlaubi, 162.
 querquedula, 164.
Quiscalus insularis, 333.
 major, 212.
 quiscula, 245, 283.

 RAIL, Clapper, 86.
 King, 78, 86.

- Rail, Yellow, 173, 179, 347.
 Raine, W., discovery of the eggs of the Belted Piping Plover, 256; nidification of the Dusky Horned Owl, 257.
 Rallus crepitans, 86.
 elegans, 79, 86, 215.
 longirostris saturatus, 185.
 Raven, American, 83.
 Redbreast, 300.
 Redhead, 201.
 Redshank, 151.
 Redstart, 285, 296.
 Black, 299, 311.
 Regulus calendula, 214, 220.
 satrapa, 214, 220, 346.
 Resler, Arthur, note on the *flexor hallucis brevis* in the Night Heron (*Nycticorax nycticorax nævius*), 172.
 Rhea americanus, 164.
 rhea, 164.
 Rhoads, Samuel N., additions to the avifauna of Tennessee, 181; 'Ord's Zoölogy' again, 192; notice of his List of Birds of Tennessee, 244.
 Richmond, Charles W., notice of papers by, on Dr. W. L. Abbott's collections of birds made in Central Asia, and in the Seychelles and other islands, 331; notice of papers by, on new species of birds, 331. See also Robinson, Wirt.
 Ridgway, R., notice of papers by, on new species of birds, 330.
 Ridgway, R., and Lucas, F. A., notice of their papers on the family Procnitidae, 334.
 Rissa brevirostris, 161.
 tridactyla kotzebeui, 161.
 tridactyla pollicaris, 161.
 Road-runner, 117, 257.
 Robin, 219, 285, 297.
 Robinson, Wirt, and Richmond, Charles W., notice of paper by on birds observed on the Island of Margarita, etc., 332.
 Rotzell, W. E., notice of his 'Birds of Narberth, Pa., and Vicinity', 244.
 Ruticilla titys, 299.
 SAGE, John H., Thirteenth Congress of the American Ornithologists' Union, 55.
 Salvadori, T., notice of his Catalogue of the Chenomorphae, Crypturi, and Ratitæ, 162.
 Salvin, Osbert, notice of his Catalogue of the Gaviæ, 161.
 Sanderling, 150, 181.
 Sandpiper, Baird's, 174, 180, 255.
 Buff-breasted, 180.
 Marsh, 151.
 Purple, 180.
 Semipalmated, 88, 180.
 Solitary, 88.
 Spotted, 281, 291, 292.
 Stilt, 180.
 Western, 88, 174.
 Wood, 151.
 Sapsucker, Yellow-bellied, 293.
 Saunders, Howard, notice of his Catalogue of the Tubinares, 160.
 Sayornis nigricans, 85, 120.
 phæbe, 282, 293.
 saya, 140.
 Scardafella ridgwayi, 333.
 Selater, P. L., notice of his remarks on 'Rules for Naming Animals,' 325.
 Scolecophagus carolinus, 212, 221, 242.
 cyanocephalus, 120.
 Scolopax rusticola, 68.
 Scoters, 203.
 Scoter, American, 89.
 White-winged, 88.
 Seebohm, Henry, biographical notice of, 96; his collection of birds, 195.
 Seiurus aurocapillus, 213, 284.
 motacilla, 86, 284, 296, 344.
 noveboracensis, 213, 245, 292, 296.
 Selasphorus rufus, 119.
 Setophaga ruticilla, 214, 285, 296.
 Schalow, Herman, notice of his 'Ueber eine Vogelsammlung aus Westgrönland,' 243.
 Shearwater, Black-vented, 223.
 Slender-billed, 171.
 Sheldrake, Pond, 203.
 Short, Ernest H., notice of his 'Birds of Western New York,' 245.
 Shoveller, 201.
 Shrike, Great Gray, 309.
 Red-backed, 309.
 White-rumped, 121.
 Shufeldt, R. W., the Cormorant Rookeries of the Lofoten Islands, 312.

- Sialia azurea*, 189.
 mexicana occidentalis, 124.
 sialis, 214, 222, 285, 297.
 sialis azurea, 185.
Sitta canadensis, 84, 213, 220, 346.
 carolinensis, 213, 220, 285, 297.
 pusilla, 213.
 Skylark, 303, 304, 306.
 Smith, Clarence A., notice of death of, 267.
 Snipe, Wilson's, 341.
 Snowbird, 294.
 Snowflake, 165.
Somateria mollissima borealis, 163.
 mollissima dresseri, 89, 202.
 spectabilis, 203, 347.
 Sparrow, Chipping 283.
 Dakota Song, 132.
 English, 239, 285, 294, 348.
 Field, 222, 283, 294.
 Fox, 217.
 Grasshopper, 294.
 Harris's, 176.
 Hedge, 310.
 House, 306.
 Ipswich, 84.
 Lark, 84.
 Leconte's, 20.
 Lincoln's, 87.
 Merrill's, 46.
 Savanna, 283, 291, 294.
 Song, 283, 291, 294.
 Tree, 181.
 Vesper, 283.
 White-throated, 159, 178, 217, 260.
 Sparrow-bunting, 159.
Spatula clypeata, 201, 215.
Speotyto brachyptera, 333.
 cunicularia hypogæa, 108, 117.
 floridana, 99.
Sphyrapicus ruber, 85.
 thyroideus, 85.
 varius, 213, 220, 292, 293.
Spinus tristis, 213, 218, 241, 242, 283, 294.
Spizella monticola, 181, 218.
 pusilla, 214, 222, 283, 294.
 socialis, 214, 283, 294.
 Spoonbill, Roseate, 209.
 Sprague, U. A., the Dwarf Thrush in Colorado, 85.
Squatarola, 65.
 helvetica, 65.
Steganopus, 65.
Stelgidopteryx serripennis, 214.
Sterna cantiaca, 161.
 dougalli, 49, 52.
 fluviatilis, 161.
 hirundo, 52, 161.
 macroura, 161.
 paradisæa, 53, 161, 245.
 sandvicensis, 161.
Stercorarius crepidatus, 161.
 parasiticus, 161, 171.
 Stone, Witmer, a revision of the North American Horned Owls, with description of a new subspecies, 153; some questions of nomenclature, 183; notice of his paper on 'The Molting of Birds with special reference to the plumage of the smaller Land Birds of Eastern North America,' 240; notice of his paper on 'Birds collected in North Greenland,' etc., 243; Golden Eagles in Virginia, 256;
Strix pratincola, 117.
Sturnella magna, 5, 213, 258, 283, 294.
 magna neglecta, 29, 258.
 Swallow, Bank, 283.
 Barn, 283, 295.
 Cliff, 121, 295.
 Eave, 307.
 White-bellied, 4.
 Swan, 79.
 Swann, H. Kirke, notice of his 'Handbook of British Birds,' 328.
 Swift, 304.
 Chimney, 82, 282, 293.
 Pied, 159.
 White-throated, 159.
Sylvia pusilla, 44.
 torquata, 44.
Sylvania canadensis, 179, 285, 292, 296.
 mitrata, 214, 285.
Symphemia semipalmata, 88, 180.
 semipalmata inornata, 215.
Synthliboramphus antiquus, 168.
Syrnium nebulosum, 222.
 nebulosum allenii, 212, 293.
 occidentale, 265.
Syrnhaptes paradoxus, 251.
 TACHORNIS, 83.
 gracilis, 114.
Tachycineta bicolor, 4, 114.
Tadorna casarca, 243.
 cornuta, 164.
 tadorna, 164.

- Tanager, Scarlet, 241, 261, 283, 295.
Tantalus loculator, 245, 341.
Taylor, H. H., the Carolina Wren in Connecticut, 84.
Teal, Blue-winged, 200.
Green-winged, 200.
Tern, Arctic, 53.
Roseate, 49, 52.
Wilson's, 51, 52.
Tetraogallus caucasicus, 253.
Thayer, Abbott H., the law which underlies protective coloration, 125; further remarks on the law which underlies protective coloration, 318.
Thrasher, Brown, 176, 218, 285, 335.
Californian, 121.
Thriothorus, 344.
Thrush, Dwarf, 75.
Gray-cheeked, 182.
Hermit, 219, 285, 291, 297.
Louisiana Water, 86.
Water, 291, 296.
Wilson's, 297.
Wood, 285, 297.
Thryothorus bewickii, 344.
bewickii bairdi, 344.
bewickii leucogaster, 344.
ludovicianus, 84, 214, 219.
Thurber, E. C., Southern California bird notes, 265; notice of death of, 349.
Tit, Blue, 300.
Coal, 300, 308.
Long-tailed, 308.
Swamp, 300, 306.
Titmouse, Great, 300.
Plain, 122.
Torrey, Bradford, Virginia notes, 179.
Totanus flavipes, 215.
melanoleucus, 207, 215.
solitarius, 88, 215.
Towhee, 260, 280, 283.
Anthony's, 165.
Townsend, C. H., notice of his 'Birds from Cocos and Malpelo Islands,' etc., 75.
Tringa alpina, 164.
bairdi, 80, 174, 180, 255.
canutus, 86, 91.
maritima, 180.
minutilla, 215.
Trochilus alexandri, 118.
colubris, 282, 293.
Trogodytes aëdon, 214, 285, 296.
aëdon aztecus, 122.
Trogodytes hiemalis, 178, 219, 292, 296.
leucogaster, 345.
marianæ, 345.
parvulus, 301.
Trogon curucui, 266.
ferrugineus, 266.
flammeus, 266.
hæmorrhoidalis, 266.
strigilatus, 265.
viridis, 262.
Tryngites subruficollis, 180.
Turdus alicæ, 182.
aonalaschkæ, 85.
aonalaschkæ pallasi, 213, 219, 285, 292, 297.
fuscescens, 213, 292, 297.
merula, 298.
mustelinus, 213, 285, 297.
Tufts, Harold F., Wilson's Snipe in Nova Scotia in Winter, 341.
Turkey, Wild, 292.
Turtur abbotti, 332.
Tyrannus tyrannus, 282, 293.
verticalis, 85.
vociferans, 85, 119.
URIA lomvia, 171.
mandtii, 266.
Urinator imber, 77, 90.
Uropsila leucogaster, 345.
VAUGHAN, C. Wheaton, Baird's Sandpiper at East Hampton, Long Island, N. Y., 80.
Vireo flavoviridis, 263.
gilvus, 87, 284.
noveboracensis, 214, 238.
olivaceus, 214, 284, 295.
solitarius, 214, 295, 345.
Vireo, Red-eyed, 283, 295.
Solitary, 291, 295, 343.
Warbling, 87, 283.
White-eyed, 238.
Yellow-green, 263.
Vulture, Turkey, 116, 222, 341.
WAGTAIL, Mountain, 310.
Pied, 149.
White, 149, 304.
Warbler, Audubon's, 121.
Bay-breasted, 181.
Black-and-White, 260, 284, 295.
Black-and-Yellow, 179.
Blackburnian, 179, 291, 295.
Black-poll, 345.

- Warbler, Black-throated Blue, 179, 295.
 Black-throated Green, 179, 284, 295.
 Canadian, 285, 291, 295.
 Cape May, 84, 87, 182.
 Cerulean, 179.
 Chestnut-sided, 88, 280, 284, 295.
 Golden-winged, 179, 285.
 Hooded, 179, 280.
 Lutescent, 121.
 Magnolia, 284, 295.
 Mourning, 179.
 Northern Parula, 44.
 Palm, 182, 343.
 Parula, 284, 295.
 Summer, 295.
 Swainson's, 207.
 Tennessee, 87.
 Worm-eating, 284.
 Yellow, 179, 284.
 Yellow-throated, 343.
 Warren, B. H., notice of his Taxidermy, etc., 334.
 Water-Thrush, Large-billed, 284.
 Louisiana, 344.
 Wayne, Arthur T., the Cape May Warbler (*Dendroica tigrina*) in the maritime portions of South Carolina, 84; the Red-breasted Nuthatch (*Sitta canadensis*) on Long Island, S. C., 84.
 Webber, Herbert J., notice of his paper on the Mockingbird and *Yucca aloifolia*, 167.
 Wharton, Henry T., notice of death of, 97.
 Whip-poor-will, 282.
 White, George R., *Porzana noveboracensis* near Ottawa, Canada, 173.
 Widgeon, European, 255.
 Widmann, O., the Peninsula of Missouri as a winter home for birds, 216; Bachman's Warbler (*Helminthophila bachmani*) in Greene County, Arkansas, 264.
 Willet, 88.
 Wilson, Sidney S., Harris's Sparrow in spring dress in autumn, 176.
 Wittichell, Charles A., notice of his 'The Evolution of Song,' 249.
 Woodcock, 126, 292.
 Woodpecker, California, 117.
 Downy, 220, 281, 293, 346.
 Hairy, 220, 281, 293, 346.
 Pileated, 220, 346.
 Red-bellied, 82, 220.
 Red-headed, 220, 258, 293.
 Rocky Mountain, 32.
 Woodruff, Frank M., the Raven in Illinois, 83; on birds reported as rare in Cook County, Ill., 179.
 Worthington, W. W., another Harlequin Duck record for Long Island, 78.
 Wren, Carolina, 84, 219.
 House, 280, 285, 295, 335.
 Short-billed Marsh, 182, 347.
 Vigors's, 121.
 Western House, 122.
 Winter, 178, 219, 295.
 Wren-tit, 122.
 XANTHOCEPHALUS xanthocephalus, 120.
 Xema sabinei, 245.
 Xenopus albolaryatus, 85.
 YELLOW-HAMMER, 303, 305, 306, 309.
 Yellow-throat, Maryland, 285, 296.
 Young, R. T., summer birds of the Anthracite Coal Regions of Pennsylvania, 278.
 ZANTHOPYGIA narcissina, 240.
 Zenaidura macroura, 215, 261.
 Zonotrichia albicollis, 159, 178, 214, 217, 260.
 harrisi, 176.

ERRATA.

- Page 161, line 21, for '*pollicaris*' read '*pollicaris*.'
 " 176, " 7, for 'decreased .20 of an inch' read 'decreased to .20 of an inch.'
 " 178, line 21, for 'on the 25th' read '25th of December.'
 " 232, " 15, for 'cave' read 'cove.'
 " " 37, for 'new' read 'old.'
 " 233, last line, for 'as regards' read 'beyond.'
 " 260, line 15 for 'Oct. 8' read 'Oct. 2.'

Old
Series,
Vol. XXI

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

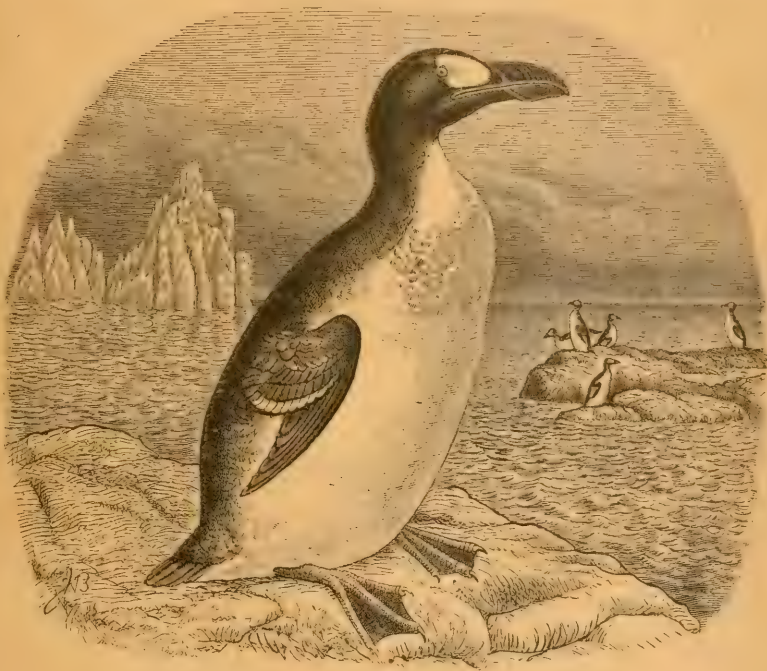
New
Series,
Vol. XIII

The Auk

A Quarterly Journal of Ornithology

Vol. **XIII** — JANUARY, 1896 —

No. 1



PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER

CONTENTS.

PAGE

IN MEMORIAM: GEORGE NEWBOLD LAWRENCE. By D. G. Elliot, F. R. S. E. (Frontispiece.)	1
THE STANDING OF <i>Ardetta neoxena</i> . By Frank M. Chapman. (Plate I.)	11
AN IMPORTANT FACTOR IN THE STUDY OF WESTERN BIRD-LIFE. By Carl F. Baker.	20
THE PINE GROSBREAK IN CAPTIVITY. By O. W. Knight.	21
DESCRIPTIONS OF AN APPARENTLY NEW SPECIES AND SUBSPECIES OF PTARMIGAN FROM THE ALEUTIAN ISLANDS. By D. G. Elliot, F. R. S. E. (Plate III.)	24
SONGS OF THE WESTERN MEADOWLARK. By L. Belding.	29
A NEW SUBSPECIES OF THE GENUS <i>Dryobates</i> . By A. W. Anthony.	31
DESCRIPTION OF A NEW JAY FROM MEXICO. By Gerrit S. Miller, Jr.	34
NESTING HABITS OF <i>Phainopepla nitens</i> IN CALIFORNIA. By Florence A. Merriam.	38
DESCRIPTIONS OF A NEW WARBLER AND A NEW SONG SPARROW. By William Brewster.	44
THE TERNS OF MUSKEGET ISLAND, MASSACHUSETTS. PART II. By George H. Mackay.	47
THIRTEENTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION. By John H. Sage.	55
RECENT LITERATURE.—Elliot's Monograph of the Pittidae, 60; The Fossil Birds of Patagonia, 61; Elliot's Limicolæ, 64; Some Canadian Birds, 67; Kirkwood on Maryland Birds, 67; The Structure and Life of Birds, 68; The A. O. U. Check-List of North American Birds, Second Edition, 69; Hudson's British Birds, 70; Bendire on the Cowbirds, 71; Lucas on the Weapons and Wings of Birds, 72; Fisher's Hawks and Owls from the Standpoint of the Farmer, 73; Beddard's 'Text-book of Zoogeography,' 73; Townsend on the Birds of Cocos Island, 75; Publications Received, 76.	

GENERAL NOTES.—Do Young Loons eat Fresh-water Clams? 77; 'Gull Dick' Again, 78; An Early Description of *Phalacrocorax dilophus*, 78; Another Harlequin Duck Record for Long Island, 78; *Olor buccinator* in Western Minnesota, 78; White-faced Glossy Ibis Breeding in Minnesota, 79; *Ardetta neoxena* from Wisconsin, 79; The King Rail Again in Maine, 79; Baird's Sandpiper in Maine, 80; The 1895 Migration of *Charadrius dominicus* in Massachusetts, 80; Habits of the Valley Partridge, 81; Additional Records of the Passenger Pigeon (*Ectopistes migratorius*) in Wisconsin and Illinois, 81; The Golden Eagle in New Jersey, 81; The Golden Eagle in Maine, 82; A New Long Island, N. Y., Record for the Red-bellied Woodpecker, 82; The Deltoid Muscle in the Swifts, 82; The Scissor-tailed Flycatcher in Virginia and Maryland, 83; The Raven in Illinois, 83; The Ipswich Sparrow.—A Correction, 84; Second Occurrence of the Lark Sparrow in Virginia, 84; The Cape May Warbler (*Dendroica tigrina*) in the Maritime Portions of South Carolina, 84; The Carolina Wren in Connecticut, 84; The Red-breasted Nuthatch (*Sitta canadensis*) on Long Island, South Carolina, 84; The Dwarf Thrush in Colorado, 85; Food of Woodpeckers and Flycatchers, 85; Rare Visitors to the Connecticut River Valley in Massachusetts in 1895, 86; A Correction, 86; Notes on Long Island Birds, 87; Nantucket Island Notes, 88; Gätke's Birds of Heligoland, 89.

CORRESPONDENCE.—The Soaring of Birds and Currents of Air, 92.

NOTES AND NEWS.—Obituary, Thomas Henry Huxley, 93; Henry Seebohm, 96; Henry T. Wharton, 97; Ornithological Lectures at Columbia College, 97; Kent Ornithological Club, 98; Protection of North American Birds, 98.

'THE AUK,' published as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is edited by Dr. J. A. ALLEN, with the assistance of Mr. F. M. CHAPMAN.

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 Dr. J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, CENTRAL PARK, NEW YORK CITY.

AUTHORS' SEPARATES.

Authors of general articles will receive 25 separates of their articles gratis. Additional copies may be ordered, if desired, but such orders must always accompany the manuscript. The prices of separates are as follows:

No. of copies.	Number of pages of article.							Covers and Title.
	2	4	8	12	16	24	32	
50	\$0.50	\$1.00	\$1.50	\$2.00	\$3.00	\$4.50	\$6.00	\$0.50
75	.65	1.15	1.75	2.25	3.25	5.00	6.50	.50
100	.80	1.30	2.00	2.50	3.75	5.50	7.00	.75

Old
Series,
Vol. XXI

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

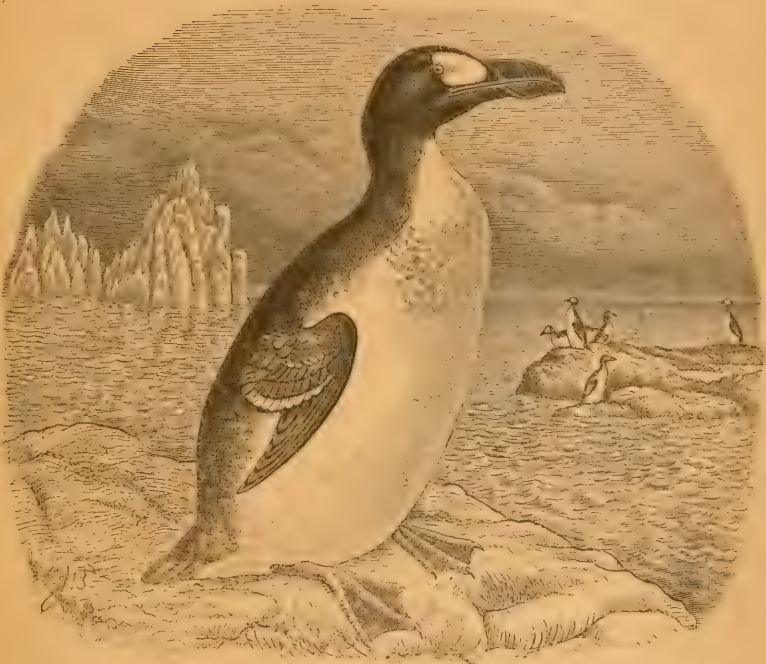
New
Series,
Vol. XIII

The Auk

A Quarterly Journal of Ornithology

Vol. XIII — APRIL, 1896 —

No. 2



PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER

CONTENTS.

	PAGE
ON THE FLORIDA GROUND OWL (<i>Speotyto floridana</i>). By William Palmer. (Plate II.)	99
THE TAXONOMIC VALUE OF THE TONGUE IN BIRDS. By Frederic A. Lucas.	109
NOTES ON SOME OF THE BIRDS OF SOUTHERN CALIFORNIA. By Florence A. Merriam.	115
THE LAW WHICH UNDERLIES PROTECTIVE COLORATION. By Abbott H. Thayer.	124
DESCRIPTIONS OF A NEW HORNED LARK AND A NEW SONG SPARROW, WITH REMARKS ON SENNETT'S NIGHTHAWK. By Louis B. Bishop.	129
AN APPARENTLY NEW <i>Chordeiles</i> from COSTA RICA. By George K. Cherrie.	135
GÄTKE'S 'HELIGOLAND.' By J. A. Allen.	137
A REVISION OF THE NORTH AMERICAN HORNED OWLS, WITH DESCRIPTION OF A NEW SUB-SPECIES. By Witmer Stone.	153

RECENT LITERATURE.—The 'Birds' of 'The Royal Natural History,' 156; Saunders and Salvin's 'Catalogue of the Gaviæ and Tubinares,' 160; Salvadori's Catalogue of the Chenomorpha, Crypturi, and Ratitæ, 162; Chapman on Changes of Plumage in the Dunlin and Sanderling, 164; Chapman on the Plumage of the Snowflake, 165; Allen on Alleged Changes of Color in the Feathers of Birds without Moulting, 166; The Mockingbird and *Vucca aloifolia*, 167; Loomis on California Water Birds, 168; Publications Received, 169.

GENERAL NOTES.—Brünnich's Murre at Cape Charles, Virginia, 171; The Parasitic Jaeger near Cleveland, Ohio, 171; *Puffinus tenuirostris*, off San Diego, California, 171; The Skull of the Young Cormorant, 172; *Clangula hyemalis* at San Diego, California, 172; Occurrence of the Great White Heron at Escondido, California, 172; Note on the *Plexor hallucis brevis* in the Night Heron (*Nycticorax nycticorax neivius*), 172; *Porzana noveboracensis* near Ottawa, Canada, 172; *Crymophilus fulvicastris* in Maine, 173; *Crex crex* in Maine, 173; Baird's Sandpiper in Michigan, 174; Western Sandpiper (*Ereunetes occidentalis*) more abundant than the Semipalmated (*E. pusillus*), 174; Woodpeckers' Tongues—a Plea for Aid, 174; *Pinicola enucleator* in Westchester County, N. Y., 175; The Pine Grosbeak at Poughkeepsie, N. Y., 175; The Pine Grosbeak (*P. enucleator*) in New Jersey, 175; Abnormal Plumage of a Pine Grosbeak, 176; The American Crossbill at Sea, 176; Harris's Sparrow in Spring Dress in Autumn, 176; A Brown Thrasher (*Harporhynchus rufus*) in Massachusetts in Winter, 176; A few Notes from Maine, 177; Three Winter Notes from Longwood, Mass., 178; Bird Notes from Erie County, New York, 178; Virginia Notes, 179; On Birds reported as rare in Cook County, Ill., 179; Additions to the Avifauna of Tennessee, 181; Sundry Notes, 182.

CORRESPONDENCE.—Some Questions of Nomenclature, 183; A Question of Nomenclature, 190; 'Ord's Zoology' Again, 192; *Chen hyperborea* and *C. nivalis*, 195.

NOTES AND NEWS.—Obituary, Dr. Willard Lorraine Maris, 193; The Delaware Valley Ornithological Club, 193; The Michigan Ornithological Club, 194; New Edition of Ridgway's 'Manual of North-American Birds,' 194; 'The Feather,' 195; The Seeböhm collection of Birds, 195; The Field Columbian Museum Expedition to Africa, 196.

'THE AUK,' published as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is edited by Dr. J. A. ALLEN, with the assistance of Mr. F. M. CHAPMAN.

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 Dr. J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, CENTRAL PARK, NEW YORK CITY.

AUTHORS' SEPARATES.

Authors of general articles will receive 25 separates of their articles gratis. Additional copies may be ordered, if desired, but such orders must always accompany the manuscript. The prices of separates are as follows:

No. of copies.	Number of pages of article.							Covers and Title.
	2	4	8	12	16	24	32	
50	\$0.50	\$1.00	\$1.50	\$2.00	\$3.00	\$4.50	\$6.00	\$0.50
75	.65	1.15	1.75	2.25	3.25	5.00	6.50	.50
100	.80	1.30	2.00	2.50	3.75	5.50	7.00	.75

Old
Series,
Vol. XXI

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New
Series,
Vol. XIII

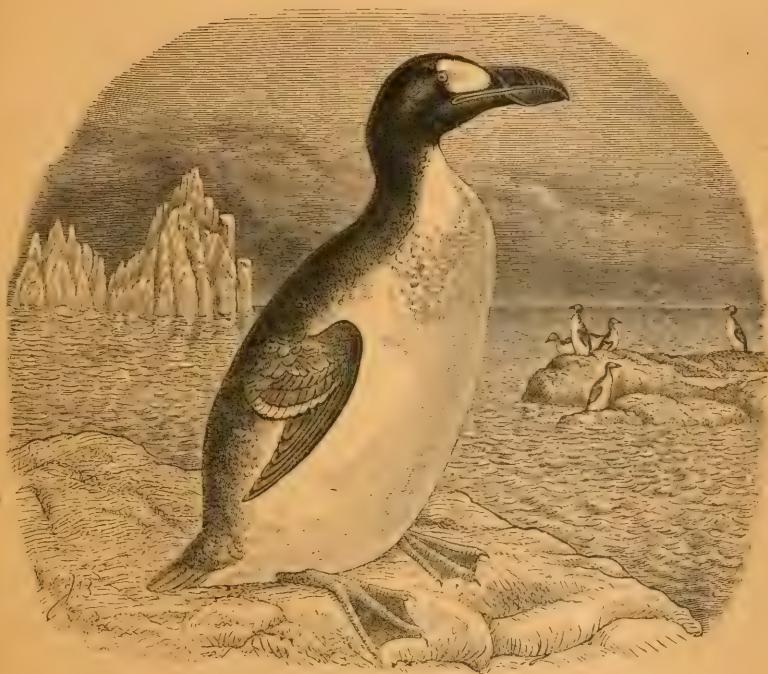
The Auk

A Quarterly Journal of Ornithology

Vol. XIII

— JULY, 1896 —

No. 3



PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER

CONTENTS.

	PAGE
THE DUCKS OF PLYMOUTH COUNTY, MASSACHUSETTS. By <i>Herbert K. Job.</i>	197
JOHN ABBOT'S DRAWINGS OF THE BIRDS OF GEORGIA. By <i>Walter Faxon.</i>	204
THE PENINSULA OF MISSOURI AS A WINTER HOME FOR BIRDS. By <i>O. Widmann.</i>	216
THE BLACK-VENTED SHEARWATER (<i>Puffinus opisthomelas</i>). By <i>A. W. Anthony.</i>	223
RECENT OBSERVATIONS ON <i>Histrionicus histrionicus</i> IN MAINE. By <i>Arthur H. Norton.</i>	229
SOME NOTES ON THE PASSENGER PIGEON (<i>Ectopistes migratorius</i>) IN CONFINEMENT. By <i>Ruthven Deane.</i>	234
NOTES ON THE BIRDS OF BERMUDA. By <i>D. Webster Prentiss.</i>	237

RECENT LITERATURE.—Stone on the Molting of Birds, 240; Stone on Birds collected in North Greenland 243; Shallow on a Collection of Birds from West Greenland, 243; Rotzell's Birds of Narberth, Pa., and Vicinity, 244; Rhoads's List of Tennessee Birds, 244; Short's Birds of Western New York, 245; A List of Nebraska Birds, 245; Cory's 'Hunting and Fishing in Florida,' with 'A Key to the Water Birds of the State,' 246; Howe's 'Every Bird,' 247; Artistic and Scientific Taxidermy, 247; Wittchell's 'Evolution of Bird Song,' 249; Harvie-Brown and Buckley's 'A Vertebrate Fauna of the Moray Basin,' 251; The 'Birds' of the Royal Natural History, 252; Publications Received, 253.

GENERAL NOTES.—Name of the Large-billed Puffin, 255; Record of a Fourth Specimen of the European Widgeon (*Anas penelope*) in Indiana, 255; Recent Occurrence of the Florida Gallinule in Southern Maine, 255; Baird's Sandpiper in Michigan, 255; The Belted Piping Plover in Massachusetts, 256; Discovery of the Eggs of the Belted Piping Plover, 256; Recent Capture of the Golden Eagle near Portland, Maine, 256; Golden Eagles in Virginia, 256; Nidification of the Dusky Horned Owl, 257; Four Winter Records of the Short-eared Owl on the Massachusetts Coast, 257; The Roadrunner as a Rat-killer, 257; The Red-headed Woodpecker in Eastern Massachusetts, 258; *Pyrocephalus rubinus mexicanus* in Los Angeles County, Cal., 258; Intergradation in Song of *Sturnella magna* and *S. m. neglecta* in Missouri, 258; *Pinicola enucleator* at Worcester, Mass., 259; Evening Grosbeak in Southern Wisconsin, 259; *Zonotrichia albicollis* and *Mniotilta varia* at Pasadena, Cal., 260; The Wintering of the Towhee at Longwood, Mass., 260; The Nonpareil at Longwood, Massachusetts, 261; Peculiar Traits of Some Scarlet Tanagers, 261; The Occurrence in Nebraska of *Vireo flavoviridis* 263; *Helminthophila rubricapilla* vs. *Helminthophila ruficapilla*, 263; Bachman's Warbler (*Helminthophila bachmani*) in Greene County, Arkansas, 264; Second Occurrence of the Blue-gray Gnatcatcher in Maine, 264; Southern California Bird Notes, 265; Merrem's Work, 265; Mandi's Inaugural Dissertation, 266; Correction, 266.

NOTES AND NEWS.—Obituary.—Dr. Juan Gundlach, 267; Clarence A. Smith, 267; The Palm Beach Museum, 268; 'The Osprey,' 268; 'The Nidologist,' 268; U. S. Biological Survey, 268; Elliot's African Expedition, 268; Zoological Nomenclature, 269.

'THE AUK,' published as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is edited by Dr. J. A. ALLEN, with the assistance of Mr. F. M. CHAPMAN.

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 Dr. J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, CENTRAL PARK, NEW YORK CITY.

AUTHORS' SEPARATES.

Authors of general articles will receive 25 separates of their articles gratis. Additional copies may be ordered, if desired, but such orders must always accompany the manuscript. The prices of separates are as follows:

No. of copies.	Number of pages of article.							Covers and Title.
	2	4	8	12	16	24	32	
50	\$0.50	\$1.00	\$1.50	\$2.00	\$3.00	\$4.50	\$6.00	\$0.50
75	.65	1.15	1.75	2.25	3.25	5.00	6.50	.50
100	.80	1.30	2.00	2.50	3.75	5.50	7.00	.75

Old
Series,
Vol. XXI

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

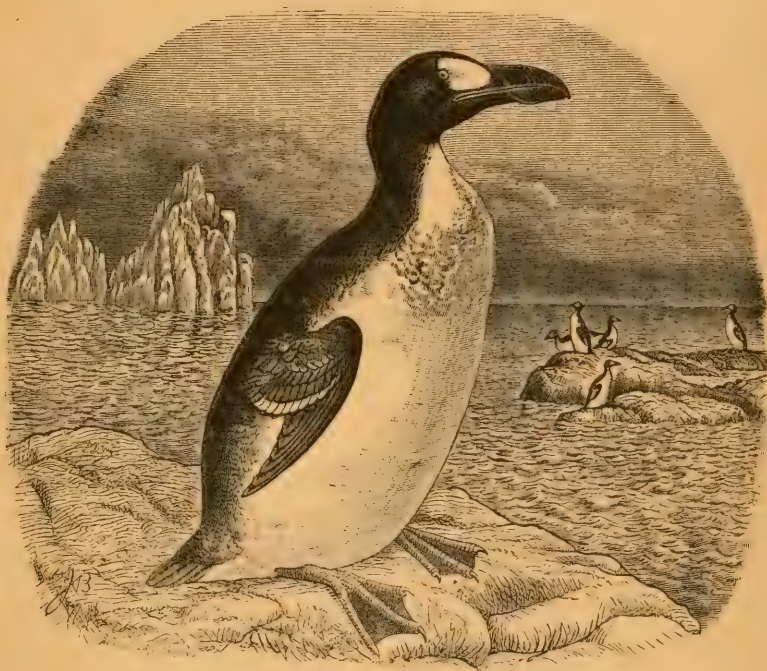
New
Series,
Vol. XIII

The Auk

A Quarterly Journal of Ornithology

Vol. **XIII** — OCTOBER, 1896 —

No. 4



PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER

CONTENTS.

	PAGE
THE SHARP-TAILED SPARROW (<i>Ammodramus caudacutus</i>) AND ITS GEOGRAPHICAL RACES. By Jonathan Dwight, Jr. (Plate IV.)	271
SUMMER BIRDS OF THE ANTHRACITE COAL REGIONS OF PENNSYLVANIA. By R. T. Young.	278
FEEDING HABITS OF THE ENGLISH SPARROW AND CROW. By Sylvester D. Judd.	285
SUMMER BIRDS OF NORTHERN ELK COUNTY, PA. By William L. Bailey.	286
SUMMER BIRDS (JULY 15-AUG. 13, 1894) OF THE RHINE. By Ralph Hoffmann.	297
THE CORMORANT ROOKERIES OF THE LOFOTEN ISLANDS. By R. W. Shufeldt, M. D. (Plate V.)	312
CRITICAL REMARKS ON THE 'MEXICAN FORMS OF THE GENUS <i>Certhia</i> . By Harry C. Oberholser.	314
FURTHER REMARKS ON THE LAW WHICH UNDERLIES PROTECTIVE COLORATION. By Abbott H. Thayer.	318
EVIDENCE SUGGESTIVE OF THE OCCURRENCE OF 'INDIVIDUAL DICHROMATISM' IN <i>Megascops asio</i> . By Arthur P. Chadbourne, M. D.	321

RECENT LITERATURE.—Sclater on Rules for Naming Animals, 325; Swann's Handbook of British Birds, 328; Loomis on California Water Birds, 329; Ridgway on New Species and Subspecies of Birds, 330; Oberholser on Two New Subspecies of *Dryobates*, 330; Richmond on Mexican Birds, 330; Richmond on New Species of Birds, 331; Dr. Abbott's Collections from Asia, 331; Dr. Abbott's Collections from the Seychelles and other Islands, 331; Robinson's Birds of Margarita, 332; Cherrie on San Domingo Birds, 333; Warren's 'Taxidermy' and Bird-Laws, 334; Ridgway and Lucas on a New Family of Birds, 334; Montgomery on Migration as a Check upon Geographical Variation, 335; Contributions to Economic Ornithology, 335; Publications Received, 338.

GENERAL NOTES.—Occurrence of the Wood Ibis (*Tantalus loculator*) in Bristol County, Mass., 341; Wilson's Snipe in Nova Scotia in Winter, 341; The Wild Pigeon at Englewood, N. J., 341; Recent Record of the Passenger Pigeon in Southern Wisconsin, 341; The Turkey Vulture in the Catskills, 341; *Buteo borealis harlani* in Minnesota, 342; A Note on *Buteo borealis lucasianus* Ridgway, 342; Feeding Habits of Purple Finches, 342; First Occurrence of the Blue Grosbeak in New Hampshire, 342; Solitary Vireo (*Vireo solitarius*) nesting in Connecticut, 343; *Dendroica palmarum* in New York City, 343; Breeding of the Yellow-throated Warbler (*Dendroica dominica*) in Virginia, near Washington, 343; The Louisiana Water-Thrush breeding in Berkshire County, Mass., 344; The Mockingbird (*Mimus polyglottos*) in Canada, 344; *Thryothorus* or *Thryothorus*? 344; The Hudsonian Chickadee breeding in Southern Vermont, 345; The Hudsonian Chickadee (*Parus hudsonicus*), Red-breasted Nuthatch (*Sitta canadensis*), and Golden-crowned Kinglet (*Regulus satrapa*) in Plymouth County, Mass., in Summer, 346; The Western Martin and the California Cuckoo at Escondido, Cal., 347; Bird Notes from Toronto, Canada, 347; Iridescence of Feathers, as explained by an Old Author, 347; Birds killed by a Storm, 348.

NOTES AND NEWS.—Obituary.—Lord Lilford, 348; Eugene Carleton Thurber, 349; Dr. G. Brown Goode, 349; Bird Day in Schools, 349; Museum of Natural History at Providence, 350; 'The Osprey', 350; 'Das Tierreich', 350; New Ornithological Publications, 351.

'THE AUK,' published as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is edited by Dr. J. A. ALLEN, with the assistance of Mr. F. M. CHAPMAN.

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 Dr. J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, CENTRAL PARK, NEW YORK CITY.

AUTHORS' SEPARATES.

Authors of general articles will receive 25 separates of their articles gratis. Additional copies may be ordered, if desired, but such orders must always accompany the manuscript. The prices of separates are as follows:

No. of copies.	Number of pages of article.							Covers and Title.
	2	4	8	12	16	24	32	
50	\$0.50	\$1.00	\$1.50	\$2.00	\$3.00	\$4.50	\$6.00	\$0.50
75	.65	1.15	1.75	2.25	3.25	5.00	6.50	.50
100	.80	1.30	2.00	2.50	3.75	5.50	7.00	.75

