





Birds

Smith

OLD SERIES,
VOL. XXXVIII

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

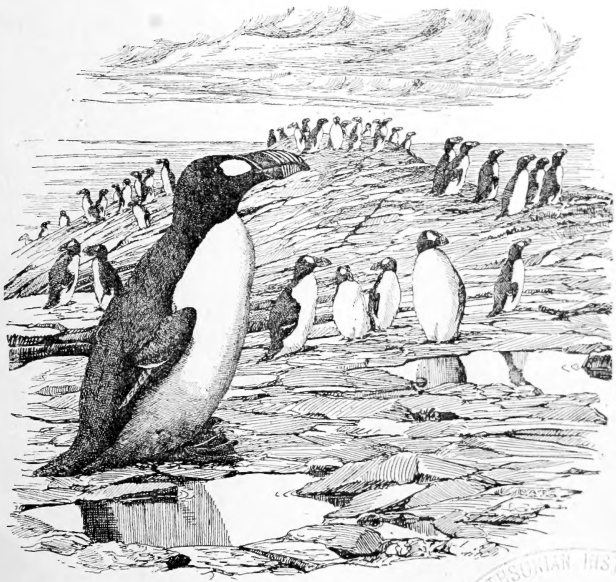
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VOL. XXX.

3

The Auk

A Quarterly Journal of Ornithology

EDITOR
WITMER STONE



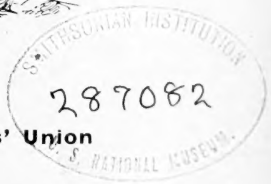
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FINSCH, Prof. Dr. OTTO, Leonhardplatz 5, Braunschweig, Germany...	1883
GODMAN, FREDERICK DuCANE, 45 Pont St., London, S. W.....	1883
HARTERT, ERNST, Zoological Museum, Tring, Herts, England...	(1891)1902
HARVIE-BROWN, JOHN A., Dunipace, Larbert, Stirlingshire, Scotland	(1883)1902
HELLMAYR, Dr. CARL E., Wittelsbacherstrasse, 2III, Munich, Germany.....	(1903)1911
IHERING, Dr. HERMANN VON, Museu Paulista, São Paulo, Brazil.	(1902)1911
PYCRAFT, W. P., British Museum (Nat. Hist.) Cromwell Road, London, S. W.	(1902)1911

* Life Fellow.

REICHENOW, Dr. ANTON, Königl. Mus. für Naturkunde, Invalidenstrasse, 43, Berlin	(1884)1891
SALVADORI, Count TOMMASO, Royal Zoöl. Museum, Turin	1883
SCLATER, Dr. PHILIP LUTLEY, Athenæum Club, Pall Mall, London, S. W.	1883
SCHALOW, HERMAN, Trauensteinerstrasse 2 ¹ , Berlin, W. 30	(1884)1911
WALLACE, Prof. ALFRED RUSSEL, Broadstone, Wimborne, Dorset, England	1883

CORRESPONDING FELLOWS.

ALFARO, ANASTASIO, San José, Costa Rica	1888
ARRIGONI DEGLI ODDI, Count E., University of Padua, Italy	1900
BONHOTE, JOHN LEWIS, Gade Spring Lodge, Hemel Hempstead, Herts, England	1911
BUREAU, Dr. LOUIS, École de Médecine, Nantes, France	1884
BUTLER, Lieut.-Col. E. A., Winsford Hall, Stokesby, Great Yarmouth, England	1884
BÜTTIKOFER, Dr. JOHANNES, Zoölogical Garden, Rotterdam, Holland	1886
BUTURLIN, SERGIUS A., Wesenberg, Esthonia, Russia	1907
CAMPBELL, ARCHIBALD JAMES, Melbourne, Australia	1902
CARRIKER, M. A., JR., Cincinnati Coffee Co., Santa Marta, Colombia	(1907)1912
CHAMBERLAIN, MONTAGUE, Cambridge, Mass	(Founder)1901
CHUBB, CHARLES, British Museum (Nat. Hist.) Cromwell Road, London, S. W.	1911
CLARKE, WILLIAM EAGLE, Museum of Science and Art, Edinburgh	1889
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Alloa, Scotland	1883
DOLE, SANFORD B., Honolulu, Hawaiian Islands	1888
DUBOIS, Dr. ALPHONSE, Museum Natural History, Brussels	1884
ECHT, ADOLPH BACHOFEN VON, Nussdorf, near Vienna	1883
EVANS, ARTHUR H., 9 Harvey Road, Cambridge, England	1899
FEILDEN, Col. HENRY W., Burwash, Sussex, England	1884
FERRARI-PEREZ, Prof. FERNANDO, Tacubaya, D. F., Mexico	1885
FREKE, PERCY EVANS, Southpoint, Limes Road, Folkstone, Kent, England	1883
FÜRBRINGER, Prof. MAX, Director Anatom. Institute, University of Heidelberg, Heidelberg, Germany	1891
GADOW, Dr. HANS, University Museum of Zoology, Cambridge, England	1884
GIRTANNER, Dr. A., St. Galle, Switzerland	1884
GODWIN-AUSTEN, Lieut.-Col. H. H., Nore, Hascombe, Godalming, Surrey, England	1884
GOELDI, Prof. Dr. EMIL A., Zieglerstrasse 36, Bern, Switzerland	1903
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris	1883

GURNEY, JOHN HENRY, Keswick Hall, Norwich, England.....	1883
HARTING, JAMES EDMUND, Edgewood, Weybridge, Surrey, England..	1883
HENNICKE, DR. CARL R., Gera, Reuss, Germany.....	1907
HENSON, HARRY V., Yokohama.....	1888
HERMAN, OTTO, Budapest, Hungary.....	1908
HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, West- bourne Park, London, W.....	1895
KRUKENBERG, DR. E. F. W., Würzburg, Germany.....	1884
KRÜPER, DR. THEOBALD J., University Museum, Athens, Greece....	1884
LEGGE, COL. WILLIAM V., Cullenswood House, St. Mary's, Tasmania..	1891
LE SOUËF, DUDLEY, Zoological Gardens, Melbourne, Australia.....	1911
MACFARLANE, RODERICK, Winnipeg, Manitoba.....	1886
MADARÁSZ, DR. JULIUS VON, National Museum, Budapest, Hungary.	1884
MATHEWS, GREGORY M., Langley Mount, Watford, Herts, England..	1911
MENZBIER, Prof. DR. MICHAEL, Imperial Society of Naturalists, Moscow.....	1884
MILLAIS, JOHN GUILLE, Compton's Brow, Horsham, Sussex, England.	1911
NAMIYE, M., Tokio.....	1886
NICHOLSON, FRANCIS, The Knoll, Windermere, Westmoreland, Eng- land.....	1884
NORTH, ALFRED J., Australian Museum, Sydney, New South Wales..	1902
OGILVIE-GRANT, WILLIAM ROBERT, British Museum (Nat. Hist.), Cromwell Road, London, S. W.....	1899
PALMÉN, DR. J. T., Helsingfors, Finland.....	1883
RAMSEY, E. P., Sydney, New South Wales.....	1884
RINGER, FREDERIC, Nagasaki.....	1888
ROTHSCHILD, Hon. LIONEL WALTER, Zoological Museum, Tring, England.....	1898
SCLATER, WILLIAM LUTLEY, 10 Sloane Court, Chelsea, London, S. W..	1906
SUSHKIN DR. PETER, Imperial University, Moscow.....	1903
THEEL, DR. HJALMAR, University of Upsala, Upsala, Sweden.....	1884
TSCHUSI ZU SCHMIDHOFFEN, VICTOR, RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.....	1884
WATERHOUSE, F. H., 3 Hanover Square, London, W.....	1889
WINGE, DR. HERLUF, University Zoological Museum, Copenhagen...	1903
WORCESTER, Prof. DEAN C., Manila, P. I.....	1903
ZELEDON, Don JOSÉ C., San José, Costa Rica.....	1884

MEMBERS.

ALLEN, FRANCIS H., 4 Park St., Boston, Mass.....	(1888)1901
ALLEN, DR. GLOVER M., 234 Berkeley St., Boston, Mass.....	(1896)1904
ALLISON, ANDREW, Southern Presbyterian Mission, Kiangyui, China.....	(1897)1902
ATTWATER, H. P., Box 697, Houston, Texas.....	(1891)1901

MILLER, MRS. OLIVE THORNE, 5928 Hays Ave., Los Angeles, Cal.	(1887)1901
MILLER, WALDRON DEWITT, Amer. Mus. Nat. Hist., New York City	(1896)1906
MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa.	(1887)1903
MORRIS, ROBERT O., 82 Temple St., Springfield, Mass.	(1888)1904
MURDOCH, JOHN, Public Library, Boston, Mass.	(1883)1901
NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Maine	(1890)1902
PEARSON, T. GILBERT, 1974 Broadway, New York City	(1891)1902
PENNOCK, CHARLES J., Kennett Square, Pa.	(1888)1901
PHILLIPS, JOHN C., Wenham, Mass.	(1904)1912
PREBLE, EDWARD A., 3027 Newark St., Washington, D. C.	(1892)1901
RATHBUN, SAMUEL F., 217 14th Ave., N., Seattle, Wash.	(1893)1902
RHOADS, SAMUEL N., 81 Haddon Ave., Haddonfield, N. J.	(1885)1901
RILEY, JOSEPH H., U. S. National Museum, Washington, D. C.	(1897)1905
RIVES, DR. WILLIAM C., 1702 Rhode Island Ave., Washington, D. C.	(1885)1901
ROBINSON, COL. WIRT, U. S. A., West Point, N. Y.	(1897)1901
SETON, ERNEST THOMPSON, Cos Cob, Conn.	(1883)1901
*SHERMAN, MISS ALTHEA R., McGregor, Iowa.	(1907)1912
STEPHENS, FRANK, R. F. D. No. 2, San Diego, Cal.	(1883)1901
STRONG, DR. REUBEN M., Dept. Zool., Univ. of Chicago, Chicago, Ill.	(1889)1903
SWALES, BRADSHAW HALL, Grosse Isle, Mich.	(1902)1909
SWARTH, HARRY S., Mus. Vert. Zool., University of California, Berkeley, Cal.	(1900)1909
TAVERNER, PERCY A., Victoria Memorial Museum, Ottawa, Canada	(1902)1909
THAYER, JOHN ELIOT, Lancaster, Mass.	(1898)1905
TODD, W. E. CLYDE, Carnegie Museum, Pittsburgh, Pa.	1890)1901
TOWNSEND, CHARLES H., Aquarium, Battery Park, New York City	(1883)1901
TOWNSEND, DR. CHARLES WENDELL, 76 Marlborough St., Boston, Mass.	(1901)1905
TROTTER, DR. SPENCER, Swarthmore College, Swarthmore, Pa.	(1888)1901
WARREN, EDWARD ROYAL, 20 West Caramillo St., Colorado Springs, Colo.	(1902)1910
WAYNE, ARTHUR T., Mt. Pleasant, S. C.	(1905)1909
WETMORE, ALEX., Biological Survey, Washington, D. C.	(1908)1912
WOLCOTT, DR. ROBERT H., Univ. of Nebraska, Lincoln, Neb.	(1901)1903
WOOD, NORMAN A., Museum Univ. of Mich., Ann Arbor, Mich.	(1904)1912
WRIGHT, MRS. MABEL OSGOOD, Fairfield, Conn.	(1895)1901

* Life Member.

ASSOCIATES.

ABBOTT, CLINTON GILBERT, 153 W. 73rd St., New York City.....	1898
ADAMS, BENJAMIN, 476 5th Ave., New York City.....	1911
ADAMS, WALLACE, Los Molinos, Cal.....	1901
ADAMS, DR. Z. B., 43 Cottage Farm Rd., Brookline, Mass.....	1908
AIKEN, CHARLES EDWARD HOWARD, 12 Pikes Peak Ave., Colorado Springs, Colo.....	1898
AIKEN, HON. JOHN, Orchard St., Greenfield, Mass.....	1905
ALEXANDER, MISS ANNIE M., 92 Sea View Ave., Piedmont, Cal.....	1911
ALLEN, ARTHUR A., 707 East State St., Ithaca, N. Y.....	1909
ALLISON, WILLIAM B., 7916 Plum St., New Orleans, La.....	1905
ANDERSON, MRS. J. C., Great Barrington, Mass.....	1903
ANDERSON, DR. RUDOLPH M., Am. Mus. Nat. History, N. Y. City.....	1907
ANDREWS, ROY C., Amer. Mus. Nat. Hist., New York City.....	1906
ANGELL, WALTER A., 33 Westminster St., Providence, R. I.....	1901
ANTHONY, H. E., Amer. Mus. Nat Hist., New York City.....	1911
ARCHBOLD, JOSEPH A., 107 Hodge Ave., Buffalo, N. Y.....	1903
ARMSTRONG, EDWARD E., 125 N. Wabash Ave., Chicago, Ill.....	1904
ARMSTRONG, MRS. E. H., Hyde Park, Boston, Mass.....	1912
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec.....	1894
ARNOLD, F. E., 284 Pleasant St., East Providence, R. I.....	1909
ARNOLD, DR. W. W., 504 N. Nevada Ave., Colorado Springs, Colo.....	1910
AVIS, EDWARD, Box 56, Enfield, Conn.....	1908
ABCOCK, DEAN, 731 Spruce St., Boulder, Colo.....	1911
BABSON, MRS. CAROLINE W., 182 Granite St., Pigeon Cove, Mass.....	1912
BABSON, W. A., South Orange, N. J.....	1901
BAGG, EGBERT, 424 Genesee St., Utica, N. Y.....	1883
BAILEY, Prof. G. A., Genesee, N. Y.....	1910
BAILEY, HAROLD H., 320 50th St., Newport News, Va.....	1903
BAILEY, SAMUEL WALDO, Box 212, Newburyport, Mass.....	1909
BAKER, FRANK C., Chicago Acad. Sciences, Chicago, Ill.....	1907
BAKER, JOHN H., 7 Holyoke Place, Cambridge, Mass.....	1911
BALDWIN, ROGER N., 3739 Windsor Place, St. Louis, Mo.....	1904
BALES, DR. BLENN R., 149 W. Main St., Circleville, Ohio.....	1907
BALL, MRS. BENNET F., Oakville, Conn.....	1905
BALL, MISS HELEN AUGUSTA, 43 Laurel St., Worcester, Mass.....	1893
BALL, JAS. P., 5001 Frankford Ave., Philadelphia, Pa.....	1911
BANKS, MISS MARTHA, Westport, Conn.....	1911
BARBOUR, Rev. ROBERT, Y. M. C. A., Montclair, N. J.....	1902
BARBOUR, DR. THOMAS, Mus. of Comp. Zoölogy, Cambridge, Mass.....	1903
BARNARD, Judge JOB, 1306 Rhode Island Ave., Washington, D. C.....	1886
BARNES, CLAUDE T., Box 1199, Salt Lake City, Utah.....	1908
BARNES, HON. R. MAGOON, Lacon, Ill.....	1889
BARRETT, CHAS. H. M., 5 Taylor St., Medford, Mass.....	1912

BARRETT, HAROLD LAWRENCE, 704 Centre St., Jamaica Plain, Mass.	1909
BARRY, MISS ANNA K., 5 Bowdoin Ave., Dorchester, Mass.	1907
BARTLETT, MISS MARY F., 227 Commonwealth Ave., Boston, Mass.	1912
BATTEN, GEORGE, 381 Fourth Ave., New York City	1911
BAYNARD, OSCAR E., Box 328, Clearwater, Fla.	1910
BAYNES, ERNEST H., Meriden, N. H.	1912
BECK, ROLLO HOWARD, San José, R. D. 21, Cal.	1894
BEERS, HENRY W., 91 Denver Ave., Bridgeport, Conn.	1895
BELL, Prof. W. B., Agri. College, N. D.	1912
BENNETTS, WILLIAM J., 1941 1st St. N. W., Washington, D. C.	1901
BERGTOLD, Dr. W. H., 1159 Race St., Denver, Colo.	1889
BERIER, DE LAGNEL, 171 Monte Vista Place, Ridgwood, N. J.	1885
BERRY, Mrs. S. JENNIE, 633 Waterloo St., London, Ontario	1909
BETTS, NORMAN DE WITT, Forest Products Lab., Madison, Wis.	1908
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa.	1898
BIGELOW, ALBERT F., 84 State St., Boston, Mass.	1910
BIGELOW, HENRY BRYANT, Concord, Mass.	1897
BIGELOW, HOMER LANE, Old Orchard Road, Chestnut Hill, Mass.	1902
BIGNELL, Mrs. EFFIE, 135 College Ave., New Brunswick, N. J.	1911
BIRDSEYE, CLARENCE, Biological Survey, Washington, D. C.	1908
BLACKWELDER, ELIOT, Univ. of Wisconsin, Madison, Wis.	1895
BLAIN, Dr. ALEX. W., Jr., 1105 Jefferson Ave., E., Detroit, Mich.	1901
BLAIN, MERRILL W., 1026 N. Coronado St., Los Angeles, Cal.	1910
BLAKE, SIDNEY F., 154 Walnut St., Stoughton, Mass.	1910
BLATCHLEY, W. S., 1530 Park Ave., Indianapolis, Ind.	1895
BLOOD, ROLAN H., Pepperell, Mass.	1912
BLOOMFIELD, Mrs. C. C., 723 Main St., W., Jackson, Mich.	1901
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.	1906
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.	1909
BOGERT, WILLIAM S., Leonia, N. J.	1904
BOLLES, Mrs. FRANK, 6 Berkeley St., Cambridge, Mass.	1912
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo.	1909
BOND, HARRY L., Lakefield, Minn.	1908
BONFILS, F. G., 1003 Corona St., Denver, Colo.	1912
BOOTH, SHERMAN M., Glen Cove, Ill.	1911
BORDEN, SPENCER, Fall River, Mass.	1912
BORLAND, Wm. G., 14 Wall St., New York City	1911
BORNEMAN, HENRY S., 1613 Dyre St., Frankford, Philadelphia, Pa.	1912
BOSSON, CAMPBELL, 722 Tremont Bldg., Boston, Mass.	1906
BOUDINOT, Mrs. H. R., 302 Rusholme St., Davenport, Iowa	1909
BOWDISH, B. S., Demarest, N. J.	1891
BOWDISH, Mrs. B. S., Demarest, N. J.	1902
BOWDITCH, HAROLD, 636 Beacon St., Boston, Mass.	1900
BOYD, Mrs. HARRIET, 17 Marsh St., Dedham, Mass.	1912
BOYNTON, CHAS. T., 1005 South Sheridan Rd., Highland Park, Ill.	1912
BRACKEN, Mrs. HENRY MARTYN, 1010 Fourth St., S. E., Minneapolis, Minn.	1897

BRADFORD, MOSES B. L., Concord Public Library, Concord, Mass.....	1889
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.....	1902
BRANDRETH, COURTENAY, Ossining, N. Y.....	1905
BRANDRETH, FRANKLIN, Ossining, N. Y.....	1889
BRANTLEY, WILLIAM FOREACRE, Blackshear, Ga.....	1912
BREWSTER, EDWARD EVERETT, 316 East C St., Iron Mountain, Mich.....	1893
BREWSTER, MRS. WILLIAM, 145 Brattle St., Cambridge, Mass.....	1912
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....	1910
BRIDGE, MRS. EDMUND, 52 Wyman St., West Medford, Mass.....	1902
BRIGHT, MISS ANNA L., Pottsville, Pa.....	1903
BRIMLEY, H. H., Raleigh, N. C.....	1904
BRISTOL, JOHN I. D., 45 West 74th St., New York City.....	1907
BROCK, DR. HENRY HERBERT, 687 Congress St., Portland, Me.....	1894
BROCKWAY, ARTHUR W., Hadlyme, Conn.....	1912
BROOKS, REV. EARLE AMOS, 419 N. River Ave., Weston, W. Va.....	1892
BROOKS, GORHAM, 92 Beacon St., Boston, Mass.....	1912
BROOKS, WINTHROP S., Milton, Mass.....	1907
BROWN, MISS ANNIE H., 31 Maple St., Stoneham, Mass.....	1909
BROWN, ARTHUR L., 119 Park St., West Roxbury, Mass.....	1908
BROWN, C. EMERSON, 44 Sudbury St., Boston, Mass.....	1908
BROWN, EDWARD J., U. S. Nat. Museum, Washington, D. C.....	1891
BROWN, FRANK A., 1 Water St., Beverly, Mass.....	1912
BROWN, H. A., 40 Talbot St., Lowell, Mass.....	1912
BROWN, MRS. HENRY T., Winchester, Mass.....	1912
BROWN, HUBERT H., Beamsville, Ontario.....	1889
BROWN, PHILLIP G., 85 Vaughan St., Portland, Me.....	1911
BROWN, STEWARDSON, 20 E. Penn St., Germantown, Philadelphia, Pa.....	1895
BROWN, WM. JAMES, 250 Olive Ave., Westmount, Quebec.....	1908
BROWNING, WM. HALL, 16 Cooper Square, New York City.....	1911
BRUEN, FRANK, 65 Prospect St., Bristol, Conn.....	1908
BUBIER, GEO. M., 185 Franklin St., Lynn, Mass.....	1911
BURBANK, CHAS. O., 48 Glenwood Ave., Newton Centre, Mass.....	1912
BURCKES, MRS. J. W., 36 Curve St., Waltham, Mass.....	1912
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....	1898
BURKE, WM. BARDWELL, 130 Spring St., Rochester, N. Y.....	1901
BURNETT, WILLIAM L., State Agric. College, Fort Collins, Colo.....	1895
BURNHAM, JOHN BIRD, 111 Broadway, New York City.....	1912
BURT, H. P., 355 Union St., New Bedford, Mass.....	1908
BURTCH, VERDI, Branchport, N. Y.....	1903
BUTLER, JEFFERSON, 121 W. Philadelphia Ave., Detroit, Mich.....	1912
BUXBAUM, MRS. CLARA E., 4822 Grand Boulevard, Chicago, Ill.....	1895
CABOT, LOUIS, Brookline, Mass.....	1904
CADUC, Eugene E., 563 Massachusetts Ave., Boston, Mass.....	1910
CALLENDER, JAMES PHILLIPS, 32 Broadway, N. Y.....	1903
CALVERT, J. FLETCHER, Collegate Inst., London, Ont.....	1912
CARPENTER, REV. CHARLES KNAPP, 311 Park St., Elgin, Ill.....	1894

CARPENTER, GEORGE I., 129 Dean St., Brooklyn, N. Y.....	1907
CARTER, JOHN D., Lansdowne, Pa.....	1907
CASE, CLIFFORD M., 7 Holcomb St., Hartford, Conn.....	1892
CASH, HARRY A., 54 Spring St., Pawtucket, R. I.....	1898
CASKEY, ROBERT C., 58 Mills St., Morristown, N. J.....	1908
CATLIN, JAMES P., Ottawa, Ill.....	1905
CHAMBERLAIN, CHAUNCY W., 36 Lincoln St., Boston, Mass.....	1885
CHAMBERS, W. LEE, Eagle Rock, Cal.....	1907
CHAPIN, Prof. ANGIE CLARA, 25 Freeman Cottage, Wellesley, Mass.....	1896
CHAPIN, JAMES, 330 W. 95th St., New York City.....	1906
CHAPMAN, Mrs. F. M., Englewood, N. J.....	1908
CHAPMAN, ROY, 507 15th Ave., S. E., Minneapolis, Minn.....	1911
CHASE, SIDNEY, Nantucket, Mass.....	1904
CHEESMAN, M. R., 55 W. 4th St., S., Salt Lake City, Utah.....	1911
CHENEY, Rev. ROBT. F., St. Mark's Rectory, Southboro, Mass.....	1912
CHIPMAN, GRACE E., Sandwich, Mass.....	1912
CHRISTIE, EDWARD H., 5069 Kensington Ave., St. Louis, Mo.....	1910
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.....	1901
CLARK, Mrs. ANNE M. L., Box 153, Lancaster, Mass.....	1912
CLARK, B. PRESTON, Box 2862, Boston, Mass.....	1907
CLARK, EDWARD B., Hamilton Hotel, Washington, D. C.....	1900
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.....	1895
CLARKE, CHARLES E., 11 Chetwynd Road, Tufts College, Mass.....	1907
CLARKE, MISS HARRIET E., 9 Chestnut St., Worcester, Mass.....	1896
CLARKE, ROWENA A., Kirkwood Branch, St. Louis, Mo.....	1906
CLARKE, Dr. WM. C., 981 Madison Ave., New York City.....	1909
CLAY, CHAS. IRVIN, Box 353, Eureka, Cal.....	1911
CLEAVES, HOWARD H., Public Museum, New Brighton, N. Y.....	1907
CLEVELAND, Dr. CLEMENT, 925 Park Ave., New York City.....	1903
CLEVELAND, Miss LILIAN, Woods Edge Road, West Medford, Mass.....	1906
COALE, HENRY K., Highland Park, Ill.....	1883
COBB, Miss ANNIE W., 301 Massachusetts Ave., Arlington, Mass.....	1909
COBB, STANLEY, 340 Adams St., Milton, Mass.....	1909
CODMAN, JOHN S., Quail St., West Roxbury, Mass.....	1908
COFFIN, Miss LUCY V. BAXTER, 3232 Groveland Ave., Chicago, Ill.....	1905
COLBURN, ALBERT E., 806 S. Broadway, Los Angeles, Cal.....	1891
COLE, Dr. LEON J., College of Agric., Univ. of Wis., Madison, Wis.....	1908
COLVIN, WALTER S., Osawatomie, Kan.....	1896
COMEY, ARTHUR C., 424 E. 13th St., Chester, Pa.....	1902
COMMONS, Mrs. F. W., 2437 Park Ave., Minneapolis, Minn.....	1902
CONEY, Mrs. GEO. H., 859 Prospect Ave., Hartford, Conn.....	1906
COOK, Miss LILIAN GILLETTE, 165 W. 82d St., New York City.....	1899
COPE, FRANCIS R., Jr., Dimock, Pa.....	1892
COPELAND, Dr. ERNEST, 141 Wisconsin St., Milwaukee, Wis.....	1897
COPELAND, MANTON, 88 Federal St., Brunswick, Me.....	1900
COREY, Miss ALICE F., 1111 Park Ave., Plainfield, N. J.....	1910

COULTER, STANLEY, Lafayette, Ind.....	1912
CRAFT, Miss LAURA F., Glen Cove, N. Y.....	1912
CRAIG, WALLACE, Opono, Me.....	1912
CRAIGMILE, Miss ESTHER A., 24 S. Grant St., Hinsdale, Ill.....	1910
CRAM, R. J., 26 Hancock Ave., W., Detroit, Mich.....	1893
CRANDALL, C. W., 10 Third St., Woodside, N. Y.....	1891
CRANE, Miss CLARA L., Dalton, Mass.....	1904
CRANE, Mrs. ZENAS, Dalton, Mass.....	1904
CRESSY, Mrs. N. S., 25 Quaker Lane, West Hartford, Conn.....	1912
CROCKER, Mrs. DAVID, Barnstable, Mass.....	1912
CROCKER, Mrs. EMMONS, 48 Mechanics St., Fitchburg, Mass.....	1912
CROSBY, MAUNSELL S., Grasmere, Rhinebeck, N. Y.....	1904
CUMMINGS, Miss EMMA G., 16 Kennard Road, Brookline, Mass.....	1903
CURRIE, ROLLA P., Dept. of Agriculture, Washington, D. C.....	1895
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., St. Johns, Ore.....	1894
CUSHMAN, Miss ALICE, 919 Pine St., Philadelphia, Pa.....	1910
CUTLER, Mrs. ANNIE F., 117 Washington Ave., Chelsea, Mass.....	1908
DANA, Miss ADA, 488 Centre St., Newton, Mass.....	1912
DANE, Mrs. ERNEST B., Chestnut Hill, Mass.....	1912
DANIELSON, Miss EDNA H., R. F. D. 3, Goodhue, Minn.....	1910
DART, Dr. LESLIE O., Curtis Court, Minneapolis, Minn.....	1898
DAVENPORT, Mrs. ELIZABETH B., Lindenhurst, Brattleboro, Vt.....	1898
DAVIDSON, Mrs. F. S., 1302 W., S. Grand Ave., Springfield, Ill.....	1912
DAVIS, CHARLES H., 515 Michigan Ave., Saginaw, Mich.....	1906
DAY, CHESTER SESSIONS, 15 Chilton Road, West Roxbury, Mass.....	1897
DAY, FRANK MILES, Mt. Airy, Philadelphia, Pa.....	1901
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DELOACH, R. J. H., University of Ga., Athens, Ga.....	1910
DENNIS, DAVID W., Richmond, Ind.....	1907
DENSMORE, Miss MABEL, 629 4th St., Red Wing, Minn.....	1910
DERBY, RICHARD, 969 Park Ave., New York City.....	1898
DERBY, W. M., Jr., 4857 Kimbark Ave., Chicago, Ill.....	1908
DERICKSON, Mrs. GEO. P., 1760 Hennepin Ave., Minneapolis, Minn.....	1910
DEVINE, J. L., 5319 Woodlawn Ave., Chicago, Ill.....	1903
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....	1900
DEWING, THOMAS W., 82 E. 55th St., New York City.....	1907
DICE, LEE RAYMOND, Prescott, Wash.....	1909
DICKERSON, Miss MARY C., Am. Mus. Nat. History, N. Y. City.....	1903
DICKEY, DONALD R., Box 701, Pasadena, Cal.....	1907
DICKEY, SAMUEL S., State College, Pa.....	1905
DILLE, FREDERICK M., 2927 W. 28th Ave., Denver, Colo.....	1892
DIMOCK, GEO. E., Jr., 907 N. Broad St., Elizabeth, N. J.....	1911
DIONNE, C. E., Laval University, Quebec, Que.....	1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.....	1891
DODGE, CHARLES W., Univ. of Rochester, Rochester, N. Y.....	1900
DODSON, JOSEPH H., 534 Sheridan Road, Evanston, Ill.....	1909

DOLBEAR, KATHERINE, Clarke University, Worcester, Mass.....	1912
DORN, Prof. L., Concordia College, Fort Wayne, Ind.....	1912
DOUGHERTY, Gen. WILLIAM E., 1409 E. 14th St., Fruitvale, Cal.....	1890
DRAPER, J. SUMNER, Readville, Mass.....	1908
DROWNE, Dr. FREDERICK PEABODY, Warren, R. I.....	1899
DRUMMOND, Miss MARY, Spring Lane, Lake Forest, Ill.....	1904
DUBOIS, ALEX. DAWES, 327 S. Glenwood Ave., Springfield, Ill.....	1905
DU BON, JAMES L., Windsor Locks, Conn.....	1909
DUDLEY, SARAH H., Lyman School, Lowell, Mass.....	1912
DUGMORE, ARTHUR RADCLYFFE, Newfoundland, N. J.....	1899
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.....	1900
DUNBAR, W. LINFRED, Union Metallic Cartridge Co., Bridgeport, Conn.....	1906
DUNN, Miss HARRIET A., Box 45, Athol, Mass.....	1909
DURFEE, OWEN, Box 125, Fall River, Mass.....	1887
DURYEA, Miss ANNIE B., 62 Washington St., Newark, N. J.....	1911
DWIGHT, Dr. EDWIN W., 119 Pearl St., Boston, Mass.....	1911
DYCHE, Prof. L. L., Pratt, Kansas.....	1886
DYER, EDWARD T., Southampton, N. Y.....	1911
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....	1902
EARLE, Miss ELEANOR P., Palma Sola, Fla.....	1910
EARLY, CHAS. H., 185 Fairmount Ave., Hyde Park, Mass.....	1912
EASTMAN, FRANCIS B., Plattsburg Barracks, N. Y.....	1909
EASTMAN, HARRY D., 24 State St., Framingham, Mass.....	1891
EATON, Miss MARY S., 8 Monument St., Concord, Mass.....	1909
EATON, SCOTT HARRISON, North Bend, Ohio.....	1912
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....	1886
EDWARDS, PHOEBE P., Brookline, Mass.....	1912
EDWARDS, VINAL N., Box 36, Woods Hole, Mass.....	1912
EHINGER, Dr. CLYDE E., 100 Rosedale Ave., West Chester, Pa.....	1904
ELCHE, AUGUST, 1133 O St., Lincoln, Neb.....	1902
EIFRIG, Rev. C. W. GUSTAVE, Addison, Ill.....	1901
EIMBECK, Dr. A. F., New Haven, Mo.....	1906
EKBLAW, WALTER ELMER, care of G. Ekblaw, Rantoul, Ill.....	1911
ELDRIDGE, ARTHUR S., South Lincoln, Mass.....	1912
ELLIOT, Mrs. J. W., 124 Beacon St., Boston, Mass.....	1912
ELLIOTT, Dr. E. EARL, 63 William St., Lyons, N. Y.....	1912
ELLS, GEORGE P., Norwalk, Conn.....	1904
ELROD, Prof. MORTON J., 205 S. 5th St., Missoula, Montana.....	1892
EMMET, CHRISTOPHER TEMPLE, Stony Brook, N. Y.....	1909
EMMET, ROBERT T., New Rochelle, N. Y.....	1904
EMORY, Mrs. MARY DILLE, 156 Foundry St., Morgantown, W. Va.....	1899
ENDERS, JOHN O., Box 546, Hartford, Conn.....	1904
EVANS, Miss NEVADA, 3637 10th Ave., S., Minneapolis, Minn.....	1910
EVANS, WILLIAM B., 205 E. Central Ave., Moorestown, N. J.....	1897
FARLEY, JOHN A., 105 Summer St., Malden, Mass.....	1904

FARR, MARCUS S., Princeton University, Princeton, N. J.	1900
FARWELL, MRS. JOHN V., Ardleigh, Lake Forest, Ill.	1896
FAY, S. PRESCOTT, 3 Brimmer St., Boston, Mass.	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo.	1898
FELL, MISS EMMA TREGO, 1534 N. Broad St., West Philadelphia, Pa.	1903
FELTON, W. R., Box 414, Miles City, Mont.	1910
FERGUSON, MRS. MARY VAN E., 57 Arlington Ave., Providence, R. I.	1912
FERRY, MISS MARY B., 19 Morgan Ave., Norwalk, Conn.	1912
FIELD, EDWARD B., 30 Gillette St., Hartford, Conn.	1898
FIELD, DR. GEO. W., Sharon, Mass.	1910
FISHER, MISS ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa.	1896
FISHER, G. CLYDE, Johns Hopkins Univ., Baltimore, Md.	1908
FISHER, WALTER T., 45 Fairfax St., Cambridge, Mass.	1907
FITTS, MRS. CAROLINE S., 29 Lakeville Place, Jamaica Plain, Mass.	1906
FLANAGAN, JOHN H., 10 Weybosset St., Providence, R. I.	1898
FLETCHER, MRS. MARY E., Proctorsville, Vt.	1898
FOOTE, MISS F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.	1897
FORBES, ALEXANDER, Milton, Mass.	1912
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.	1901
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.	1898
FOX, DR. WILLIAM H., 1826 Jefferson Place, Washington, D. C.	1883
FRANCIS, GEO. A., 1453 Sea View Ave., Bridgeport, Conn.	1911
FRASER, DONALD, Johnstown, N. Y.	1902
FRAZIER, J. F., Audubon, Iowa.	1909
FREEMAN, MISS HARRIET E., 37 Union Park, Boston, Mass.	1903
FRENCH, CHARLES H., Canton, Mass.	1904
FRENCH, MRS. CHAS. H., Canton, Mass.	1908
FULLER, CLARENCE T., 71 Broadway, New York City.	1907
FULLER, MRS. ELLA M., Needham, Mass.	1909
FULLER, T. OTIS, Needham, Mass.	1904
GABRIELSON, IRA N., 201 N. 3rd St., Marshalltown, Iowa.	1912
GANO, MISS LAURA, 744 National Road, W., Richmond, Ind.	1903
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.	1903
GARRICK, JAMES P., Jr., Weston, S. C.	1906
GATH, JOHN, Box 234, Torrington, Conn.	1901
GERTKEN, SEVERIN, St. Johns University, Collegeville, Minn.	1912
GIANINI, CHAS. A., Poland, N. Y.	1911
GIBSON, JOHN T., Southborough, Mass.	1912
GIBSON, LANGDON, 5 Union St., Schenectady, N. Y.	1904
GILMAN, M. FRENCH, Sacaton, Arizona.	1907
GLADDING, MRS. JOHN R., 30 Stimson Ave., Providence, R. I.	1912
GLEASON, ALFRED D., Gleasondale, Mass.	1912
GODSHALL, W. V., Center Hall, Pa.	1912
GOLSAN, LEWIS S., Autaugaville, Ala.	1912
GOODALE, DR. JOSEPH LINCOLN, 258 Beacon St., Boston, Mass.	1885

GOODRICH, JULIET T., 1210 Astor St., Chicago, Ill.	1904
GORDON, HARRY E., 313 Laburnum Ave., Rochester, N. Y.	1911
GOULD, DR. ALFRED M., Malden, Mass.	1912
GOULD, JOSEPH E., 5 Clifton St., Norfolk, Va.	1889
GRAHAM, WM. J., Aledo, Ill.	1909
GRANGER, MISS HELEN, Wilder Hall, Amherst, Mass.	1904
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York City.	1891
GRANT, WM. W., Englewood, N. J.	1910
GRAVES, MRS. CHARLES B., 66 Franklin St., New London, Conn.	1905
GRAY, MISS ISA E., 5 Chestnut St., Boston, Mass.	1912
GREENE, CAROLINE S., 32 Linnaean St., Cambridge, Mass.	1912
GREEN, MISS MARY AMORY, Croton-on-Hudson, N. Y.	1911
GREENOUGH, HENRY VOSE, 23 Monmouth Court, Brookline, Mass.	1909
GREGORY, STEPHEN S., Jr., 1349 Astor St., Chicago, Ill.	1906
GRISCOM, LUDLOW, 21 Washington Sq., N., New York City.	1908
GRONBERGER, S. M., Smithsonian Inst., Washington, D. C.	1909
GROSS, ALFRED O., 17 McKeen St., Brunswick, Me.	1907
GUILD, HENRY R., 102 Beacon St., Boston, Mass.	1912
GUTSELL, JAMES S., 301 College Ave., Ithaca, N. Y.	1911
HADLEY, ALDEN H., Monrovia, Indiana.	1906
HALES, HENRY, Ridgewood, N. J.	1890
HALL, FRANK H., Agricultural Experiment Station, Geneva, N. Y.	1910
HALL, H. PORTER, Leominster, Mass.	1904
HALLETT, GEO. H., Jr., Haverford College, Haverford, Pa.	1911
HAMILTON, DR. B. A., Highland Park, Ill.	1909
HANKINSON, THOS. LEROY, Charleston, Ill.	1897
HARDON, MRS. HENRY W., 315 West 71st St., New York City.	1905
HARDY, JOHN H., Jr., Littleton, Mass.	1905
HARPER, FRANCIS, 555 First Ave., College Point, N. Y.	1907
HARPER, MRS. GEO. V., 102 Pennsylvania Ave., Wilmington, Del.	1910
HARRIS, HARRY, Kansas City, Mo.	1911
HARRIS, ROY C., 725 N. 10th St., Richmond, Ind.	1911
HART, CHARLES G., Box 47, East Berlin, Conn.	1908
HARVEY, MISS RUTH SAWYER, 1203 Woodland Ave., Cincinnati, Ohio.	1902
HASKELL, MISS HELEN P., 1207 Henry St., Alton, Ill.	1905
HATHAWAY, HARRY S., Box 1466, Providence, R. I.	1897
HAVEMEYER, H. O., Jr., Mahwah, N. J.	1893
HAZARD, HON. R. G., Peace Dale, R. I.	1885
HEIL, CHARLES E., Needham, Mass.	1908
HELME, ARTHUR H., Miller Place, N. Y.	1888
HEMENWAY, MRS. HARRIET L., Readville, Mass.	1912
HENDERSON, ALEXANDER, Woodlawn Rd., Chestnut Hill, Mass.	1912
HENDERSON, Judge JUNIUS, Boulder, Colo.	1903
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.	1885
HENN, ARTHUR WILBUR, Indiana University, Bloomington, Ind.	1909
HERRICK, HAROLD, 25 Liberty St., New York City.	1905

HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass.....	1911
HERSEY, L. J., 2121 W. 34th Ave., Denver, Colo.....	1909
HESS, ISAAC E., Philo, Ill.....	1909
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....	1900
HIGGINS, HENRY CHAS., Uxbridge, Mass.....	1912
HILL, JAMES HAYNES, 202 Broad St., New London, Conn.....	1897
HILL, MRS. THOMAS R., Box 491, Chautauqua, N. Y.....	1903
HILL, WILLIAM H., 83 Marvin St., Brookline, Mass.....	1912
HINCKLEY, GEO. LYMAN, Public Library, Boston, Mass.....	1912
HINCKLEY, HENRY H., Melrose Highlands, Mass.....	1912
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....	1899
HINE, MRS. JANE L., Auburn, Ind.....	1890
HITCHCOCK, FRANK H., Metropolitan Club, Washington, D. C.....	1891
HIX, GEORGE E., 630 Columbus Ave., New York City.....	1904
HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass.....	1899
HOLDEN, Mrs. EDWIN B., 323 Riverside Drive, New York City.....	1903
HOLDEN, Mrs. EMELINE R., 13 E. 79th St., New York City.....	1902
HOLLAND, HAROLD MAY, Galesburg, Ill.....	1910
HOLLAND, Dr. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....	1899
HOLLISTER, WARREN D., 620 McPhea Bld'g., Denver, Colo.....	1901
HOLMAN, RALPH H., 50 Congress St., Boston.....	1907
HOLT, ERNEST G., Barachias, Ala.....	1911
HOLT, Mrs. NANCY W. C., 13 Chauncey St., Cambridge, Mass.....	1908
HONYWILL, ALBERT W., Jr., 522 Holmes St., Wilkensburg, Pa.....	1907
HORSFALL, BRUCE, Princeton, N. J.....	1905
HOTCHKISS, Miss JULIA R., 502 W. 113 St., New York City.....	1912
HOWE, FLORENCE A., Box 334, Indianapolis, Ind.....	1912
HOWE, CARLTON D., Morrisville, Vt.....	1901
HOWE, REGINALD HEBER, Jr., Thoreau Museum, Concord, Mass.....	1895
HOWELL, A. BRAZIER, Covina, Cal.....	1909
HOWELL, BENJ. F., Jr., R. F. D. 1., Boonton, N. J.....	1907
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.....	1912
HOYT, Miss ANNIE S., 121 Madison Ave., New York City.....	1909
HOYT, WILLIAM H., Box 425, Stamford, Conn.....	1907
HUBBARD, Dr. LUCIUS L., Houghton, Mich.....	1907
HUBBARD, Mrs. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....	1891
HUDSON, Mrs. K. W., 33 Trowbridge St., Cambridge, Mass.....	1911
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.....	1895
HUNT, CHRESWELL J., 740 S. Cuyler Ave., Oak Park, Ill.....	1902
HUTCHINSON, Dr. W. F., Box 42, Portsmouth, Va.....	1910
HVOSLEF, J. C., Lanesboro. Minn.....	1912
INGALLS, CHARLES E., East Templeton, Mass.....	1885
INGERSOLL, ALBERT M., Box 843, San Diego, Cal.....	1885
IRVING, JOHN, Glen Cove, N. Y.....	1894
ISHAM, C. B., 27 W. 67 St., New York City.....	1891
IVES, H. DAVID, Southampton, N. Y.....	1912

JACKSON, HARTLEY H. T., Biological Survey, Washington, D. C.	1910
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.	1888
JAMES, MRS. I. M., 105 W. Court St., Doylestown, Pa.	1909
JENKINS, Miss IDA G., 30 Dearborne St., Roxbury, Mass.	1912
JENKS, CHAS. W., Bedford, Mass.	1912
JENNEY, CHARLES F., 100 Gordon Ave., Hyde Park, Mass.	1905
JENSEN, J. K., Westwood, Mass.	1912
JESSUP, J. M., Smithsonian Institution, Washington, D. C.	1910
JEWEL, LINDSEY L., Box 303, Colon, Panama	1910
JEWETT, STANLEY G., 582 Bidwell Ave., Portland, Oregon	1906
JEWETT, McCORMICK, 395 Yale Station, New Haven, Conn.	1909
JOHNS, ERWIN WM., Kingsley, Iowa	1910
JOHNSON, CHAS. E., 714 16 Ave., S. E., Minneapolis, Minn.	1912
JOHNSON, FRANK EDGAR, 16 Amackassin Terrace, Yonkers, N. Y.	1888
JOHNSON, MRS. GRACE PETTIS, City Library Asso., Springfield, Mass.	1908
JOHNSON, JAMES HOWARD, Bradford, N. H.	1894
JOHNSON, WALTER ADAMS, 120 W. 32d St., New York City	1889
JOHNSON, WILLIAM S., Lyons, N. Y.	1893
JOHNSTON, J. W., 5 Arnold Park, Rochester, N. Y.	1911
JONES, F. W., 448 Broadway, Somerville, Mass.	1912
JONES, Dr. LOMBARD C., Falmouth, Mass.	1912
JORDAN, A. H. B., Everett, Wash.	1888
JUMP, MRS. EDWIN R., 350 Waltham St., West Newton, Mass.	1910
KALMBACH, EDWIN R., Biological Survey, Washington, D. C.	1910
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario	1899
KEIM, THOMAS DANIEL, Fellowship Farm, Stelton, N. J.	1902
KENDALL, H. F., Virginia, Minn.	1911
KENDRICK, WILLIAM F., Denver, Colo.	1912
KENISTON, ALLAN, Box 148, Edgartown, Mass.	1912
KENT, EDWIN C., 90 West St., New York City	1907
KERMODE, FRANCIS, Provincial Museum, Victoria, B. C.	1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.	1904
*KIDDER, NATHANIEL T., Milton, Mass.	1906
KILBURN, FRANK M., Fort Fairfield, Me.	1911
KILGORE, WILLIAM, Jr., 4304 Colfax Ave., S., Minneapolis, Minn.	1906
KILMAN, A. H., Ridgeway, Ontario	1909
KING, LE ROY, 20 E. 84th St., New York City	1901
KIRKHAM, MRS. JAMES W., 275 Maple St., Springfield, Mass.	1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.	1910
KIRKWOOD, FRANK C., Baldwin, Md.	1892
KITTREDGE, JOSEPH, Jr., 69 Cypress St., Brookline, Mass.	1910
KLOSEMAN, Miss JESSIE E., 4 Spruce St., Dedham, Mass.	1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.	1906
KNAPP, MRS. HENRY A., 301 Quincy Ave., Scranton, Pa.	1907

* Life Associate.

KNOLHOFF, FERDINAND WILLIAM, Bloomfield, N. J.....	1890
KOHLER, LOUIS SLIDELL, 98 Watsessing Ave., Bloomfield, N. J.....	1910
KREMER, ROLAND EDWARD, 1720 Vilas St., Madison, Wis.....	1909
KUSER, ANTHONY R., Bernardsville, N. J.....	1908
KUSER, MRS. ANTHONY R., Bernardsville, N. J.....	1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....	1910
KUTCHIN, DR. VICTOR, Green Lake, Wis.....	1905
LACEY, HOWARD GEORGE, Kertville, Texas.....	1899
LAMB, CHAS. R., 159 Brattle St., Cambridge, Mass.....	1912
LANCASHIRE, MRS. JAMES HENRY, Alma, Mich.....	1909
LANE, LAWTON W., 121 Franklin St., Lynn, Mass.....	1909
LANG, HERBERT, Amer. Mus. Nat. Hist., New York City.....	1907
LANTZ, PROF. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.....	1885
LARRABEE, AUSTIN P., 1540 Vassar Ave., Wichita, Kan.....	1902
LATIMER, MISS CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y.....	1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa.....	1902
LAW, J. EUGENE, Hollywood, Cal.....	1907
LAWRENCE, JOHN B., 126 E. 30th St., New York City.....	1907
LEE, HENRY E., Rapid City, S. D.....	1910
LEMAN, J. HOWARD, 48 Beacon St., Boston, Mass.....	1912
LEMSEN, NICHOLAS F., 34 Nassau St., New York City.....	1912
LENGERKE, JUSTUS VON, 200 5th Ave., New York City.....	1907
LEVEY, W. CHARLESWORTH, Alton Bay, N. H.....	1908
LEWIS, DR. FREDERIC T., 76 Oxford St., Cambridge, Mass.....	1909
LEWIS, HARRISON F., R. R. 2 Yarmouth, Nova Scotia.....	1912
LEWIS, MRS. HERMAN, 120 Grove St., Haverhill, Mass.....	1912
LINCOLN, FREDERICK CHARLES, 3350 Shoshone St., Denver, Colo.....	1910
LINSAY, DR. D. MOORE, 808 Boston Block, Salt Lake City, Utah.....	1912
LINTON, CLARENCE B., 125 West Ocean Ave., Long Beach, Cal.....	1908
LINZEE, JOHN W., 96 Charles St., Boston, Mass.....	1912
LORD, REV. WILLIAM R., Dover, Mass.....	1901
LORING, J. ALDEN, Owego, N. Y.....	1889
LOW, ETHELBERG T., 30 Broad St., New York City.....	1907
LUCE, MRS. FRANCES P., 140 Washington St., Boston, Mass.....	1912
LUM, EDWARD H., Chatham, N. J.....	1904
LUTHER, CLARENCE H., 8 McIlroy Bldg., Fayetteville, Ark.....	1910
MACDOUGALL, GEORGE R., 112 Wall St., New York City.....	1890
MACKIE, DR. WM. C., 54 Coolidge St., Brookline, Mass.....	1908
MACLAY, MARK W., Jr., 830 Park Ave., New York City.....	1905
MADDOCK, MISS EMELINE, The Drexel, Philadelphia, Pa.....	1897
MADISON, HAROLD L., Park Museum, Providence, R. I.....	1912
MAHER, J. E., Windsor Locks, Conn.....	1902
MAITLAND, ROBERT L., 141 Broadway, New York City.....	1889
MANN, ELIAS P., Williamstown, Mass.....	1912
MARBLE, RICHARD M., 7 Keiffer St., Brookline, Mass.....	1907
MARCH, PROF. JOHN LEWIS, Union College, Schenectady, N. Y.....	1903

MARRS, Mrs. KINGSMILL, 9 Commonwealth Ave., Boston, Mass.....	1903
MARSDEN, H. W., Witch Creek, Cal.....	1904
MARSHALL, ELLA, M. O., New Salem, Mass.....	1912
MARTIN, Miss MARIA ROSS, Box 365, New Brunswick, N. J.....	1902
MARTIN, GEO. C., Box 332, Asbury Park, N. J.....	1912
MARX, EDWARD J. F., 8 Chestnut Terrace, Easton, Pa.....	1907
MATTERN, EDWIN S., 105 South 4th St., Allentown, Pa.....	1912
MATTERN, WALTER, 105 South 4th St., Allentown, Pa.....	1912
MAULE, GEO. C., Gum Tree, Pa.....	1910
MAY, Miss ADELINA, 226 Ocean St., Lynn, Mass.....	1912
MAYNARD, C. J., 447 Crafts St., West Newton, Mass.....	1912
McCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....	1900
McCONNELL, HARRY B., Cadiz, O.....	1904
McCOOK, PHILIP JAMES, 15 William St., New York City.....	1895
McHATTON, Dr. HENRY, 335 Golley St., Macon, Ga.....	1898
McILHENNY, EDWARD AVERY, Avery Island, La.....	1894
McINTIRE, Mrs. HERBERT BRUCE, 4 Garden St., Cambridge, Mass...	1908
McLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va...	1893
McMILLAN, Mrs. GILBERT, Gorham, N. H.....	1902
MEAD, Mrs. E. M., 301 W. 91 St., New York City.....	1904
MEANS, CHAS. J., 29 Marlborough St., Boston, Mass.....	1912
MELLUS, J. T., 36 Cottage St., Wellesley, Mass.....	1912
MERRIAM, CHARLES, Weston, Mass.....	1908
MERRIAM, HENRY F., 30 Clinton Ave., Maplewood, N. J.....	1905
MERRILL, ALBERT R., Hamilton, Mass.....	1912
MERRILL, HARRY, Bangor, Maine.....	1883
MERSON, W. B., Saginaw, Mich.....	1905
MESSINGER, G. H., Linden, Iowa.....	1911
METCALF, ROBT. W., 160 High St., Springfield, Mass.....	1912
METCALF, WILLARD L., 33 West 67th St., New York City.....	1908
MILLER, CHAS. W., Shawnee-on-Delaware, Pa.....	1909
MILLER, LEO., Amer. Museum Nat. Hist., New York City.....	1912
MILLS, HARRY C., Box 218, Unionville, Conn.....	1897
MILLS, HERBERT R., Tampa, Fla.....	1911
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O.....	1900
MITCHELL, CATHERINE ADAMS, Riverside, Ill.....	1911
MITCHELL, Dr. WALTON I., 603 Beacon Bldg., Wichita, Kan.....	1893
MOIR, ALEX. L., 77 Hampshire St., Lowell, Mass.....	1912
MOORE, HENRY D., Haddonfield, N. J.....	1911
MOORE, Miss ELIZ. PUTNAM, New Jersey State Hospital, Trenton, N. J.	1905
MOORE, ROBERT THOMAS, 46 Mansion Ave., Haddonfield, N. J.....	1898
MOORE, WILLIAM G., 257 W. Main St., Haddonfield, N. J.....	1910
MORCOM, G. FREAN, 734 Belden Ave., Chicago, Ill.....	1886
MORE, R. L., Vernon, Texas.....	1911
MORGAN, ALBERT, Box 1323, Hartford, Conn.....	1903
MORLEY, G. GRISWOLD, 2325 13th St., Boulder, Colo.....	1911

MORRIS, SIDNEY V., Bristol, Pa.	1911
MORSE, HARRY GILMAN, Huron, Ohio.	1912
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose, Mass.	1905
MOSSMAN, MISS MARY, 1616 Blue Hill Ave., Boston, Mass.	1912
MURPHEY, DR. EUGENE E., 444 Tellfair St., Augusta, Ga.	1903
MURPHY, ROBERT C., 224 Angell St., Providence, R. I.	1905
MUSGRAVE, JOHN K., 3516 Shady Ave., Allegheny, Pa.	1909
MUSSELMAN, THOMAS EDGAR, Gem City Business College, Quincy, Ill.	1910
MYERS, MRS. HARRIET W., 311 Ave. 66, Los Angeles, Cal.	1906
MYERS, MISS LUCY F., Brookside, Poughkeepsie, N. Y.	1898
NASH, HERMAN W., Box 264, Pueblo, Colo.	1892
NELSON, JAMES ALLEN, Bureau of Entomology, Washington, D. C.	1898
NEWELL, MRS. H. S., 2431 E. 5th St., Duluth, Minn.	1912
NEWMAN, DANIEL S., Strafford, Pa.	1908
NEWMAN, REV. STEPHEN M., Howard University, Washington, D. C.	1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me.	1890
NICHOLS, JOHN TREADWELL, Am. Mus. Nat. Hist., New York City.	1901
NICHOLSON, DONALD J., W. Church St., Orlando, Fla.	1912
NOLTE, REV. FELIX, St. Benedict's College, Atchison, Kan.	1903
NORRIS, J. PARKER, JR., 2122 Pine St., Philadelphia, Pa.	1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.	1904
NOVY, FRANK ORIEL, 721 Forest Ave., Ann Arbor, Mich.	1909
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y.	1897
OGDEN, DR. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.	1897
OLDYS, HENRY, Silver Springs, Md.	1896
*OLIVER, DR. HENRY KEMBLE, 2 Newbury St., Boston, Mass.	1900
OSBORN, ARTHUR A., 58 Washington St., Peabody, Mass.	1912
OSBURN, PINGREE S., 189 E. Colorado St., Pasadena, Cal.	1910
OVERTON, DR. FRANK, Patchogue, N. Y.	1909
*OWEN, MISS JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.	1897
PACKER, JESSE E., Norwood Station, Pa.	1910
PAINE, AUGUSTUS G., JR., 18 West 49th St., New York City.	1886
PALADIN, ARTHUR, N. Y. State Museum, Albany, N. Y.	1911
PALMER, S. C., Swarthmore College, Swarthmore, Pa.	1912
PARKER, MRS. BENJAMIN W., 4 Hopestill St., Dorchester Centre, Mass.	1909
PARKER, HON. HERBERT, South Lancaster, Mass.	1904
PARSONS, JOHN E., LENOX, MASS.	1912
PARSONS, R. L., 158 Raymond Ave., South Orange, N. J.	1911
PARSONS, WILLIAM, Box 422, Manila, P. I.	1909
PAUL, LUCIUS H., 202 Edinburgh St., Rochester, N. Y.	1908
PEABODY, REV. P. B., Blue Rapids, Kan.	1903
PEARSON, LEONARD S., 132 Beechtree Lane, Wayne, Pa.	1907
PEAVEY, ROBERT W., 791 Coney Island Ave., Brooklyn, N. Y.	1903
PECK, MORTON E., 292 N. Summer St., Salem, Ore.	1909

* Life Associate.

PECK, WALTER M., 15 9th St., East Providence, R. I.....	1909
PENARD, THOS. E., 16 Norfolk Rd., Arlington, Mass.....	1912
PENFIELD, Miss ANNIE S., 155 Charles St., Boston, Mass.....	1912
PENNINGTON, FRED ALBERT, 5529 Monroe Ave., Chicago, Ill.....	1910
PEPPER, Dr. WM., 1811 Spruce St., Philadelphia, Pa.....	1911
PERKINS, Dr. GEO. H., Burlington, Vt.....	1912
PERRY, HENRY JOSEPH, 636 Beacon St., Boston, Mass.....	1909
PETERS, ALBERT S., Lake Wilson, Minn.....	1908
PETERS, JAMES LEE, Harvard, Mass.....	1904
PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....	1912
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899
PHILIPP, PHILIP B., 220 Broadway, New York City.....	1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....	1891
PHILLIPS, CHAS. LINCOLN, 4 West Weir St., Taunton, Mass.....	1912
PIERREPONT, JOHN JAY, 1 Pierrepont Place, Brooklyn, N. Y.....	1911
PILSBURY, FRANK O., Box 592, Walpole, Mass.....	1909
PINCHOT, GIFFORD, 1617 Rhode Island Ave., Washington, D. C.....	1910
PITCAIRN, WILLIAM G., 3330 Perrysville Ave., Allegheny, Pa.....	1906
POE, Miss MARGARETTA, 1222 N. Charles St., Baltimore, Md.....	1899
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....	1894
POND, Miss ELLEN J., 160 Lexington, Ave., New York City.....	1909
POOLE, ALFRED D., 401 W. 7th St., Wilmington, Del.....	1901
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....	1908
PORTER, Rev. E. C., 51 Fowler St., Boston, Mass.....	1912
PORTER, LOUIS H., Stamford, Conn.....	1893
POST, WM. S., 347 5th Ave, New York City.....	1911
POTTER, JULIAN K., Camden, N. J.....	1912
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PRIMM, ROY LEE, 113 W. Dayton St., Madison, Wis.....	1912
PROCTOR, Mrs. HENRY H., 282 Commonwealth Ave., Boston, Mass.....	1912
PROCTOR, THOS. E., Topsfield, Mass.....	1912
PURDY, JAMES B., R. F. D. 4, Plymouth, Mich.....	1893
PUTNAM, Prof. F. W., Cambridge, Mass.....	1912
RABORG, WM. A., Jr., Muirkirk, Md.....	1909
RATHBORNE, R. C., Bernardsville, N. J.....	1911
RAMSDEN, CHAS. G., Box 146, Guantanamo, Cuba.....	1912
RAWSON, CHAS. T., Oxford, Mass.....	1912
RAWSON, CALVIN LUTHER, R. F. D. 2, Putnam, Conn.....	1885
RAYMOND, Mrs. C. E., 21 3d St., Hinesdale, Ill.....	1910
REA, PAUL M., Charleston Museum, Charleston, S. C.....	1912
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.....	1896
REDFIELD, ALFRED C., 56 Plympton St., Cambridge, Mass.....	1907
REDFIELD, Miss ELISA WHITNEY, 29 Everett St., Cambridge, Mass.....	1897
REECHER, SAMUEL E., Chester, Ill.....	1912
REED, HUGH DANIEL, 108 Brandon Place, Ithaca, N. Y.....	1900

REHN, JAMES A. G., 6033 B Catherine St., Philadelphia, Pa.....	1901
REYNOLDS, THEO. E. W., R. F. D. 2, Kent, Wash.....	1912
RHOADS, CHARLES J., 1914 S. Rittenhouse Sq., Philadelphia, Pa.....	1895
RICE, JAMES HENRY, JR., Summerville, S. C.....	1910
RICHARDS, MISS HARRIET E., 36 Longwood Ave., Brookline, Mass..	1900
RICHARDSON, WYMAN, 224 Beacon St., Boston, Mass.....	1912
RIDEOUT, A. LILLIAN, 15 Farragut Rd., Swampscott, Mass.....	1912
RIDGWAY, JOHN L., Chevy Chase, Md.....	1890
RIKER, CLARENCE B., 43 Scotland Rd., South Orange, N. J.....	1885
RING, CLARK L., Saginaw, Mich.....	1912
RIPLEY, CHAS., 173 Harvard St., Dorchester, Mass.....	1912
RIPLEY, MRS. J. W., 112 Cedar St., Malden, Mass.....	1912
ROBBINS, MISS ALMEDA B., Y. M. Library Association, Ware, Mass..	1910
ROBERTS, JOHN T., JR., 350 Main St., Buffalo, N. Y.....	1906
ROBERTS, WILLIAM ELY, 5501 Spruce St., Philadelphia, Pa.....	1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Cal.....	1911
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....	1903
ROBINSON, LEWIS W., Cresskill, N. J.....	1910
ROBINSON, DR. PHILIP E., 102 Huntington Ave., Boston, Mass.....	1908
ROCKWOOD, MRS. GEO. I., 340 May St., Worcester, Mass.....	1912
*ROGERS, CHARLES H., Amer. Mus. Nat. Hist., New York City....	1904
ROLFE, ALFRED G., High School, Pottstown, Pa.....	1909
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROPER, KENYON, 509 N. 4th St., Steubenville, Ohio.....	1911
ROSS, GEORGE H., 23 West St., Rutland, Vt.....	1904
ROSS, DR. LUCRETIVS, 507 Main St., Bennington, Vt.....	1912
ROSSIGNOL, GILBERT R., JR., 2116 Bull St., Savannah, Ga.....	1909
ROWLEY, JOHN, 42 Plaza Drive, Berkeley, Cal.....	1889
SACKETT, CLARENCE, Rye, N. Y.....	1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SALLEY, FITZHUGH, Charleston Museum, Charleston, S. C.....	1907
SANBORN, COLIN C., 709 E. Lincoln Ave., Highland Park, Ill.....	1911
SANFORD, HARRISON, Litchfield, Conn.....	1905
SASS, HERBERT RAVENEL, 23 Legare St., Charleston, S. C.....	1906
SAUNDERS, ARETAS A., Chateau, Mont.....	1907
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....	1895
SAVAGE, WALTER GILES, Delight, Ark.....	1898
SCHANTZ, ORPHEUS M., 5215 W. 24th St., Cicero, Ill.....	1907
SCHENCK, FREDRIC, 52 Brattle St., Cambridge, Mass.....	1912
SCHMIDT, WALDO, U. S. S. "Albatross," Sausalito, Cal.....	1910
SCHWEDER, ARTHUR, 184 Upper Mountain Ave., Montclair, N. J....	1911
SEWALL, JOTHAM B., 1501 Beacon St., Brookline, Mass.....	1912
SHANNON, WM. PURDY, 1170 Broadway, New York City.....	1908
SHARPLES, ROBERT P., West Chester, Pa.....	1907

* Life Associate.

SHAW, CHAS. F., 676 Bedford St., North Abington, Mass.....	1912
SHAW, Dr. J. HOLBROOK, 43 Court St., Plymouth, Mass.....	1912
SHAW, WILLIAM T., 600 Linden Ave., Pullman, Wash.....	1908
SHEARER, AMON R., Mont Belvieu, Tex.....	1905
SHELDON, CHARLES, 140 W. 57th St., New York City.....	1911
SHELTON, ALFRED, 2237 Dwight Way, Berkeley, Cal.....	1911
SHIRAS, GEORGE, 3d, Stoneleigh Court, Washington, D. C.....	1907
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.....	1910
SHOEMAKER, FRANK H., 206 Nebraska Hall, Station A, Lincoln, Neb..	1895
SHOEMAKER, HENRY W., 26 W. 53 St., New York City.....	1912
SHORE, EDWIN W., 191 Campbell St., New Bedford, Mass.....	1909
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....	1899
SILLIMAN, HARPER, 4 Gramercy Park, New York City.....	1902
SIMMONS, GEO. F., Stewart Bldg., Houston, Texas.....	1910
SLADE, Mrs. DANIEL D., Chestnut Hill, Mass.....	1912
SMITH, AUSTIN PAUL, Falfurrias, Texas.....	1911
SMITH, BYRON L., 2140 Prairie Ave., Chicago, Ill.....	1906
SMITH, Miss ETHEL M., Rome, Ohio.....	1910
SMITH, Rev. FRANCIS CURTIS, Boonville, N. Y.....	1903
SMITH, Prof. FRANK, Univ. of Ill., Urbana, Ill.....	1909
SMITH, HORACE G., State Capitol, Denver, Colo.....	1888
SMITH, Dr. HUGH M., 1209 M St. N. W., Washington, D. C.....	1886
SMITH, JESSE L., 141 South 2nd St., Highland Park, Ill.....	1907
SMITH, LOUIS IRVIN, Jr., 3908 Chestnut St., Philadelphia, Pa.....	1901
SMITH, MYRTON T., 308 Pearl St., Hartford, Conn.....	1909
SMITH, WILBUR F., South Norwalk, Conn.....	1909
SMYTH, Prof. ELISON A., Jr., Polytechnic Inst., Blacksburg, Va...	1892
SNYDER, WILL EDWIN, R. F. D. 6, Beaver Dam, Wis.....	1895
SPAULDING, FRED B., Lancaster, N. H.....	1894
SPELMAN, HENRY M., 48 Brewster St., Cambridge, Mass.....	1911
STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.....	1883
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.....	1909
STEELE, JOHN H., Flemington, N. J.....	1906
STEPHENS, T. C., Morningside College, Sioux City, Iowa.....	1909
STEVENS, FRANK E., 25 Hudson St., Somerville, Mass.....	1912
STEVENS, Dr. J. F., Box 546, Lincoln, Neb.....	1908
STILES, EDGAR C., 345 Main St., West Haven, Conn.....	1907
ST. JOHN, EDWARD PORTER, 1566 Broad St., Hartford, Conn.....	1911
STOCKBRIDGE, CHAS. A., Fort Wayne, Ind.....	1911
STODDARD, HERBERT LEE, 218 25th St., Milwaukee, Wis.....	1912
STONE, CLARENCE F., Branchport, N. Y.....	1903
STONE, WM. D., Fayetteville, Ark.....	1911
STOVER, ALLAN J., Kings Rd., R. F. D. 3, Corvallis, Ore.....	1912
STRATER, FRANCIS A., 50 Sumner Rd., Brookline, Mass.....	1912
STRATER, Mrs. WM. E., 1114 3d. Ave., Louisville, Ky.....	1910
STRATTON-PORTER, Mrs. GENE, Box S55, Geneva, Ind.....	1906

STREET, J. FLETCHER, Beverly, N. J.....	1908
STRODE, W. S., LEWISTON, Ill.....	1911
STURGIS, S. WARREN, 152 Brattle St., Cambridge, Mass.....	1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....	1896
STYER, Mrs. KATHARINE R., Concordville, Pa.....	1903
SUMMERS, JOHN N., 17 E. Highland Ave., Melrose Highlands, Mass.....	1912
SUMNER, Mrs. GRAHAM, Englewood, N. J.....	1910
SURFACE, Prof. HARVEY ADAM, State Zoölogist, Harrisburg, Pa.....	1897
SWAIN, JOHN MERTON, Box 633, Farmington, Me.....	1899
SWEET, EDMUND H., Sturgis, S. D.....	1910
SWENK, MYRON H., 3028 Starr Street, Lincoln, Neb.....	1904
SWEZEY, GEORGE, 855 S. 15th St., Newark, N. J.....	1901
TAYLOR, ALEXANDER R., 1410 Washington St., Columbia, S. C.....	1907
TAYLOR, B. F., 1619 Green St., Columbia, S. C.....	1911
TERRILL, LEWIS McI., Stanley Ave., St. Lambert, Quebec.....	1907
TEST, CHARLES DARWIN, Golden, Col.....	1906
TEST, Dr. FREDERICK CLEVELAND, 4620 Greenwood Ave., Chicago, Ill.....	1892
TEST, LOUIS AGASSIZ, Rolla, Mo.....	1908
THOMAS, Miss EMILY HINDS, 2000 Spruce St., Philadelphia, Pa.....	1901
THOMPSON, CHAS. S., 1721 Mission St., South Pasadena, Cal.....	1909
THORNE, SAMUEL, 19 Cedar St., New York City.....	1908
THURSTON, HENRY, Box 181, Floral Park, N. Y.....	1912
TILLEY, GEO. D., Darien, Conn.....	1910
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.....	1907
TOMLINSON, FRANKLIN L., Box 572, Shelton, Conn.....	1912
TOPPAN, GEORGE L., care of Col. C. Pfaff, Framingham, Mass.....	1886
TOWER, Mrs. KATE DENIG, 9 Newbury St., Boston, Mass.....	1908
TOWNSEND, WILMOT, 334 80th St., Brooklyn, N. Y.....	1894
TREGANZA, A. O., 610 Utah Savings & Trust Bldg., Salt Lake City, Utah.....	1906
TRIPPE, THOMAS M., Howardsville, Colo.....	1909
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....	1899
TRUMBULL, J. H., Plainville, Conn.....	1907
TUDBURY, WARREN C., 8 Mall St., Salem, Mass.....	1903
TUFTS, LE ROY MELVILLE, Thrushwood, Farmington, Me.....	1903
TUFTS, Miss MARY I., 1 Atlantic St., Lynn, Mass.....	1910
TUTTLE, Dr. ALBERT H., 1069 Boylston St., Boston, Mass.....	1908
TUTTLE, Dr. CARL, Berlin Heights, Ohio.....	1890
TUTTLE, HENRY EMERSON, 253 Yale Station, New Haven, Conn.....	1909
TWEEDY, EDGAR, 37 Fairview Ave., Danbury, Conn.....	1902
TYLER, JOHN G., 1114 Belmont Ave., Fresno, Cal.....	1912
TYLER, Dr. WINSOR M., 522 Mass. Ave., Lexington, Mass.....	1912
ULRICH, ALBERT GEORGE, 3307 Washington Ave., St. Louis, Mo.....	1909
UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.....	1900

VALENTINE, MISS ANNA J., Bellefonte, Pa.....	1905
VAN BEUREN, MISS LOUISE, 21 W. 14th St., New York City.....	1909
VAN CORTLANDT, MISS ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN NAME, WILLARD GIBBS, N. Y. State Museum, Albany, N. Y....	1900
VAN SANT, MISS ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....	1896
VANTASSELL, F. L., 116 High St., Passaic, N. J.....	1907
VETTER, DR. CHARLES, 2 West 88th St., New York City.....	1898
VIETOR, DR. ED. W., 166 St. James Place, Brooklyn, N. Y.....	1911
VISHER, STEPHEN S., Vermilion, S. D.....	1904
VOTEY, Prof. J. WM., 489 Main St., Burlington, Vt.....	1912
VROOMAN, ISAAC H., Jr., 282 Hamilton St., Albany, N. Y.....	1908
WADSWORTH, CLARENCE S., 37 Washington St., Middletown, Conn....	1906
WAITE, MISS ELIZABETH W., 29 Shepard St., Cambridge, Mass....	1912
WAITE, MRS. J. GILMAN, 19 Pearl St., Medford, Mass.....	1912
WALEs, EDWARD H., Hyde Park, N. Y.....	1896
WALEs, MISS ELLA S., 186 Columbia Road, Dorchester, Mass.....	1908
WALKER, CURTIS H., University of Chicago, Chicago, Ill.....	1910
WALKER, ERNEST P., Laramie, Wyo.....	1911
WALKER, GEO. R., R. F. D. 3, Murray, Utah.....	1909
WALKER, DR. R. L., 355 Main Ave., Carnegie, Pa.....	1888
WALLACE, MRS. J. GILMAN, 533 Front St., E., Toronto, Ontario.....	1907
WALTER, DR. HERBERT E., 53 Arlington Ave., Providence, R. I....	1901
WALTERS, FRANK, South Sandisfield, Mass.....	1902
WARD, FRANK HAWLEY, 18 Grove Place, Rochester, N. Y.....	1908
WARD, HENRY L., 882 Hackett Ave., Milwaukee, Wis.....	1906
WARD, MRS. MARTHA E., 25 Arlington St., Lynn, Mass.....	1909
WARNER, EDWARD P., Concord, Mass.....	1910
WARNER, GOODWIN, Concord Junction, Mass.....	1908
WEBER, J. A., Palisades Park, N. J.....	1907
WEBBER, MRS. W. G., Box F., Bedford, Mass.....	1912
WEIR, J. ALDEN, 471 Park Ave., New York City.....	1899
WELLMAN, GORDON B., 54 Beltran St., Malden, Mass.....	1908
WELLS, CHAS. S., Elwyn, Pa.....	1911
WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J.....	1902
WENTWORTH, IRVING H., Matehuala, S. L. P., Mexico.....	1900
WETMORE, MRS. EDMUND, 125 E. 57th St., New York City.....	1902
WEYGANDT, CORNELIUS, Wissahickon Ave., Mt. Airy, Philadelphia, Pa.	1907
WHARTON, WILLIAM P., Groton, Mass.....	1907
WHEELER, EDMUND JACOB, 177 Pequot Ave., New London, Conn....	1898
WHEELER, HARVEY, Elm St., Concord, Mass.....	1912
WHEELOCK, MRS. IRENE G., 1040 Hinman Ave., Evanston, Ill.....	1902
WHITCOMB, MYRON L., 40 Westland Terrace, Haverhill, Mass.....	1912
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....	1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ontario.....	1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....	1902
WHITE, W. C., CHESTER, S. C.....	1911

WHITNEY, Prof. DAVID D., Wesleyan Univ., Middletown, Conn.....	1912
WICKERSHAM, CORNELIUS W., Cedarhurst, N. Y.....	1902
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, T. FERDINAND, 162 W. 54th St., New York City.....	1895
WILDE, MARK L. C., 311 N. 5th St., Camden, N. J.....	1893
WILLARD, BERTEL G., 30 Huntington Ave., Boston, Mass.....	1906
WILLARD, FRANK C., Tombstone, Arizona.....	1909
WILLET, GEORGE, 2123 Court St., Los Angeles, Cal.....	1912
WILLIAMS, HARRY C., 4919 Maple Ave., St. Louis, Mo.....	1908
WILLIAMS, ROBERT S., New York Botanical Gardens, Bronx Park, New York City.....	1888
WILLIAMS, ROBERT W., Jr., Tallahassee, Fla.....	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILLISTON, Mrs. SAMUEL, 577 Belmont St., Belmont, Mass.....	1911
WINDLE, FRANCIS, 253 Dean St., West Chester, Pa.....	1909
WINSLOW, ARTHUR M., 3 Lyford St., Worcester, Mass.....	1912
WITHERBEE, Mrs. F. B., 106 Berkeley St., West Newton, Mass.....	1906
WOOD, Mrs. GEO., 1313 Spruce St., Philadelphia, Pa.....	1910
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich.....	1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C....	1895
WOODRUFF, FRANK M., 225 Wisconsin St., Chicago, Ill.....	1904
WOODRUFF, LEWIS B., 24 Broad St., New York City.....	1886
WORCESTER, Mrs. ALFRED, Bacon St., Waltham, Mass.....	1908
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y.....	1889
WRIGHT, ALBERT H., 707 E. State St., Ithaca, N. Y.....	1906
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich.	1907
WRIGHT, HORACE WINSLOW, 107 Pinckney St., Boston, Mass.....	1902
WRIGHT, HOWARD W., 830 N. Orange Grove Ave., Pasadena, Cal....	1907
WRIGHT, SAMUEL, Conshohocken, Pa.....	1895
WYMAN, LUTHER E., R. F. D. 3, Nampa, Idaho.....	1907
YOUNG, Miss HARRIET FIBLE, Maple & Monroe Sts., Hinsdale, Ill....	1911
YOUNG, JOHN A., 371 Dundas St., London, Ontario.....	1907
YOUNG, JNO. P., 1510 5th Ave., Youngstown, Ohio.....	1911
ZAPPEY, WALTER R., 137 Westminster Ave., Arlington Heights, Mass..	1905
ZIMMER, J. T., 421 Holdridge St., Lincoln, Neb.....	1908

DECEASED MEMBERS.

FELLOWS.

	<i>Date of Death</i>
ALDRICH, CHARLES.....	March 8, 1908
BAIRD, SPENCER FULLERTON.....	Aug. 19, 1887
BENDIRE CHARLES EMIL.....	Feb. 4, 1897
COUES, ELLIOTT.....	Dec. 25, 1899
GOSS, NATHANIEL STICKNEY.....	March 10, 1891
HOLDER, JOSEPH BASSETT.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
McILWRAITH, THOMAS.....	Jan. 31, 1903
MERRILL, JAMES CUSHING.....	Oct. 27, 1902
PURDIE, HENRY AUGUSTUS.....	March 29, 1911
SENNETT, GEORGE BURRITT.....	March 18, 1900
TRUMBULL, GURDON.....	Dec. 28, 1903
WHEATON, JOHN MAYNARD.....	Jan. 28, 1887

HONORARY FELLOWS.

BLANFORD, WILLIAM THOMAS.....	June 23, 1905
BOCAGE, J. V. BARBOZA DU.....	July —, 1908
BURMEISTER, HERMANN.....	May 1, 1892
CABANIS, JEAN.....	Feb. 20, 1906
GÄTKE, HEINRICH.....	Jan. 1, 1897
GIGLIOLI, HENRY HILLYER.....	Dec. 14, 1909
GUNDLACH, JUAN.....	March 14, 1896
GURNEY, JOHN HENRY.....	April 20, 1890
HARTLAUB, GUSTAV.....	Nov. 20, 1900
HUXLEY, THOMAS HENRY.....	June 29, 1890
KRAUS, FERDINAND.....	Sept. 15, 1895
LAWRENCE, GEORGE NEWBOLD.....	Jan. 17, 1895
MEYER, ADOLF BERNARD.....	Feb. 5, 1911
MILNE-EDWARDS, ALPHONSE.....	April 21, 1900
NEWTON, ALFRED.....	June 7, 1907
PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SALVIN, OSBERT.....	June 1, 1898
SAUNDERS, HOWARD.....	Oct. 20, 1907
SCHLEGEL, HERMANN.....	Jan. 17, 1884
SEEBOHM, HENRY.....	Nov. 26, 1895
SHARPE, RICHARD BOWDLER.....	Dec. 25, 1909
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING FELLOWS.

ALTUM, C. A.	Jan. 1, 1900
ANDERSON, JOHN	Aug. 16, 1900
BALDAMUS, EDUARD	Oct. 30, 1893
BLAKISTON, THOMAS WRIGHT	Oct. 15, 1891
BLASIUS, RUDOLPH	Sept. 21, 1907
BLASIUS, WILHELM	May 31, 1912
BOGDANOW, MODEST NIKOLAEVICH	March 4, 1888
BRYANT, WALTER E.	May 21, 1905
BULLER, WALTER LAWRY	July 19, 1906
COLLETT, ROBERT	Jan. 27, 1913
COOPER, JAMES GRAHAM	July 19, 1902
CORDEAUX, JOHN	Aug. 1, 1899
DAVID, ARMAND	Nov. 10, 1900
DUGÈS, ALFRED	Jan. 7, 1910
FATIO, VICTOR	March 19, 1906
HAAST, JULIUS VON	Aug. 15, 1887
HARGITT, EDWARD	March 19, 1895
HAYEK, GUSTAV EDLER VON	Jan. 9, 1911
HOLUB, EMIL	Feb. 21, 1902
HOMEYER, EUGEN FERDINAND VON	May 31, 1889
KNUDSON, VALDEMAR	Jan. 8, 1898
LAYARD, EDGAR LEOPOLD	Jan. 1, 1900
LEVERKÜHN, PAUL	Dec. 5, 1905
LYTTLETON, THOMAS LORD LILFORD	June 17, 1896
MARSCHALL, AUGUST FRIEDRICH	Oct. 11, 1887
MALMGREN, ANDERS JOHAN	April 12, 1897
MIDDENDORFF, ALEXANDER THEODORE VON	Jan. 28, 1894
MOSJISOVICS, FELIX G. HERMANN AUGUST	Aug. 27, 1897
OATES, EUGENE WILLIAM	Nov. 16, 1911
OUSTALET, EMILE	Oct. 23, 1905
PHILIPPI, RUDOLPH AMANDUS	Aug. —, 1904
PREJEVALSKI, NICOLAS MICHAELOVICH	Oct. 20, 1887
PRENTISS, DANIEL WEBSTER	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN	Feb. 17, 1888
RADDE, GUSTAV FERDINAND	— 1903
SCHRENCK, LEOPOLD VON	Jan. 20, 1894
SÉLEYS-LONGSCHAMPS, EDMOND DE	Dec. 11, 1900
SEVERTZOW, NICOLAI ALEKSYEWVICH	Feb. 8, 1885
SHELLEY, GEORGE ERNEST	Nov. 29, 1910
STEVENSON, HENRY	Aug. 18, 1888
TRISTRAM, H. B.	March 8, 1906
WHARTON, HENRY T.	Sept. —, 1895
WOODHOUSE, SAMUEL W.	Oct. 23, 1904

MEMBERS.

FANNIN, JOHN.....	June 20, 1904
HARDY, MANLY.....	Dec. 9, 1910
JUDD, SYLVESTER DWIGHT.....	Oct. 22, 1905
RALPH, WILLIAM LEGRANGE.....	July 8, 1907
TORREY, BRADFORD.....	Oct. 7, 1912
WHITMAN, CHARLES OTIS.....	Dec. 6, 1910

ASSOCIATES.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ANTES, FRANK T.....	Feb. 6, 1907
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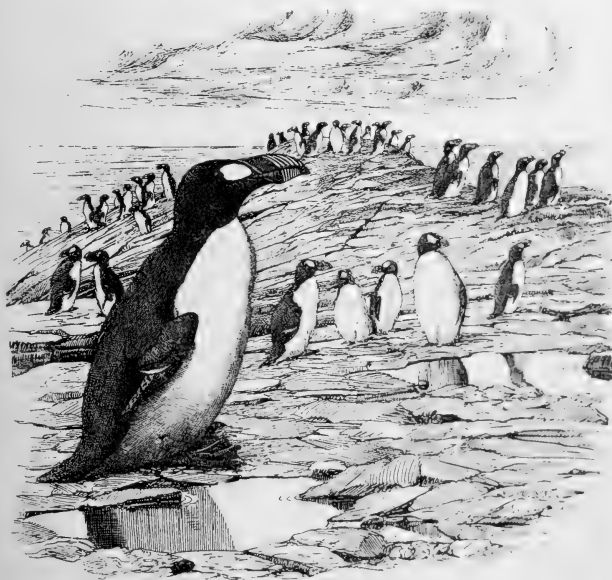
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1. LOW SAND BANKS ABOUT FIVE MILES FROM THE MOUTH OF THE NATASHQUAN RIVER SHOWING SPRUCE AND FIR FOREST.



2. ON THE BRINK OF THE THIRD FALLS; A PIECE OF THE FOURTH FALLS CAN BE SEEN IN THE DISTANCE.

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No. 1.

SOME MORE LABRADOR NOTES.

BY CHARLES W. TOWNSEND, M. D.¹

Plates I-II.

THE following notes on the birds of the Labrador Peninsula are the result of a canoe trip some eighty miles up the Natashquan river and ten or fifteen miles up a subsidiary stream, and of the steamer journey to and from the mouth of the river. Owing to the almost continuous stormy weather during the four weeks of the trip, conditions for bird observation were unsatisfactory. In addition the start was made later than I had intended and the song season was nearly over.

Leaving Quebec on July 20, 1912, I reached Natashquan on July 25 and started up the great river the next day with a companion and two French fishermen. The Natashquan River empties into the Gulf of St. Lawrence about half way between the base of the peninsula and the Straits of Belle Isle. On August 1 a point was reached about eighty miles up the river, some sixty miles from the sea in a direct line. Returning about forty miles, a subsidiary stream on the west side was ascended ten or fifteen miles and three days were spent in exploring the small lakes and surrounding country. Returning to Natashquan, I caught the steamer on August 10 and reached Quebec on August 14.

In the paper by Mr. Bent and myself ² a description of this coastal strip of the Labrador Peninsula is given, as well as our reasons

¹ Read at the meeting of the American Ornithologists' Union, Nov. 12, 1912.

² Additional Notes on the Birds of Labrador. Auk, XXVII, 1910, pp. 1-18.

for believing that the high land which we visited where it approached the coast at Mingan was arctic in appearance only, and that it had been deforested by fire.

The valley of the Natashquan river as far as I went was densely forested with black spruce and balsam fir. White spruces and white birches were not uncommon while a few mountain ashes, larches, and aspens were also seen, and alders and low willows occurred in places on the river's edge. The forest trees were from 30 to 60 feet high but rarely attained a diameter of more than a foot. An exceptional white birch was 72 inches in circumference and a balsam fir, 64 inches. Their growth was very slow; for example, a balsam fir, which we cut for bedding, was $7\frac{3}{4}$ inches in diameter, 48 feet tall and showed 182 rings.

The river is over a mile wide at its mouth and flows between low sand banks for twelve miles. Above this rapids and falls abound in the granitic rock, and the surrounding hills increase in size as one ascends. Glacial gouges and scratches are everywhere plain; their average direction is south 12° east, in relation to true north. Marine cliffs of sand and clay over one hundred and fifty feet high are cut by the river some seventy-five miles from the sea. The whole region has undergone recent elevation by tilting following a previous submersion. At our farthest point inland many of the hills, 800 feet or more above the river, were wooded, while others were nearly destitute of trees. As at Mingan I found the charred stumps of trees on the high land showing that it was formerly forested.

Very few birds were seen along the coast — pitiful remnants of the great hosts that formerly bred there. Loons were common, Red-throated Loons uncommon. Of Puffins only two were seen off the Perroquets on the journey down and two on the return. One was seen near Piashte-bai. Black Guillemots were fairly common. Of Murres, either *troille* or *lomvia*, I saw four between Natashquan and Esquimaux Point, and fourteen between Mingan and Seven Islands. Of Razor-billed Auks I saw only two off the Perroquets on the trip down and three on the return, as well as two near Piashte-bai. A Dovekie was seen on July 21 above the region of the Labrador Peninsula near Godbout. Mr. Napoleon A. Comeau, the veteran naturalist of this place, told me that

a few Dovekies are generally to be found along the coast in summer. While these birds are called Bull-birds by the English-speaking inhabitants on the eastern coast, the French of the southern coast call them *Bons Hommes*.

Eight Parasitic Jaegers were seen off Long Point; several of these were in the dark phase. Kittiwakes in small numbers were seen along the coast especially in the region of the Perroquets; nearly all were in immature plumage. At the mouth of the Natashquan River four immature Glaucous Gulls consorted with Great Black-backed and Herring Gulls and both of these last named Gulls were common on the coast. Terns were common everywhere but not in large numbers. Those examined carefully with glasses seemed to be all Common Terns except one seen at close range at Natashquan that was an Arctic Tern.

One Petrel, probably a Wilson's Petrel, was seen off the Mingan Islands. No Gannets were to be seen about the Perroquets on our passage east, and but five on the return, three in adult, two in immature plumage. I was told that although a few of these birds visited the place every season, none had bred there for years. This corresponds with the results obtained here by Mr. Bent and myself in 1909. On August 10 the steamer passed near enough to a rocky island off Agwannus for me to see some fifty or sixty Double-crested Cormorants thereon. This was one of the three colonies visited by Mr. Bent and myself in 1909.

Of Ducks, a few Red-breasted Mergansers and one or two Whistlers were seen along the coast. Eiders were fairly common, but not abundant, east of Mingan. All were in the brown plumage, although an occasional male was seen with a few white feathers still remaining. The males are believed by many on the coast to disappear after the middle of July and this they can do effectually by dropping their conspicuous nuptial dress and donning the well named eclipse plumage. All three species of Scoters were seen in small numbers on the coast.

On and near the beach at Natashquan and about the Little Natashquan River, Semipalmated Sandpipers, Sanderlings, Greater Yellow-legs, Spotted Sandpipers, Hudsonian Curlews, Semipalmated and Piping Plovers and Ruddy Turnstones were found in small numbers. Of these the Hudsonian Curlews and Piping Plover

are worthy of note. Of the Hudsonian Curlew I saw 25 on the beach at Natashquan on July 25 and 12 flying about the barren hills near Natashquan village on August 8. They were all very wild. Curlew berries, mountain cranberries and bake-apples (cloud berries) were abundant there and the natives said that the Curlew fed on them. As recorded by Allen and myself in our 'Birds of Labrador'¹ Audubon stated that the Hudsonian Curlew was 'entirely unknown' on this coast, but Stearns in 1880 and '81, and Frazer in 1884, both found it not a rare migrant in the fall. Mr. Johan Beetz told Mr. Bent and myself in 1909 that *le courlis*,— by which he must have meant this species,— was increasing on the coast. This is interesting in connection with the apparent increase of the Hudsonian Curlew in Essex County, Mass.² in the last 60 years. No Eskimo Curlew were seen.

Mr. Bent and I found two Piping Plover on the beach at Natashquan on May 31, 1909. This was the first record of this species for the Labrador Peninsula. On July 25, 1912, I saw two adults and two fully grown young in a family group on this same beach.

So much for the water birds of this coast; their numbers are steadily diminishing for the eggs, nesting-birds and young are the prey not only of the Indians but of the fishermen all along the coast. It is to be hoped that adequate protection will be given them before it is too late.

In the trip up the Natashquan River the following birds were identified, and are worth recording as so little is known of the interior of Labrador. The small number of species and of individuals is partly to be accounted for by the lateness of the season and the unpropitious weather. A reason for the scarcity of ducks and other water-fowl is the fact that the river is one of the highways of migration of the Montagnais Indians. They descend it in the latter part of May with their packs of furs obtained in the interior. After disposing of the furs to the traders, attending to their religious festivities in the Catholic Mission, and feasting on sea birds' eggs and flesh they return up the river in August.

1. **Gavia immer.** LOON.—Two or three seen.
2. **Gavia stellata.** RED-THROATED LOON.—A few near the mouth of the river.

¹ Proc. Boston Soc. Nat. Hist., July, 1907.

² Birds of Essex County, p. 190.



1. THE NATASHIQWAN RIVER ABOUT FIFTY MILES FROM THE MOUTH.



2. CHARACTER OF THE COUNTRY ABOUT FORTY MILES INLAND, AS SEEN FROM THE HILL FREQUENTED BY THE RED-TAILED HAWK.

3. **Larus marinus.** GREAT BLACK-BACKED GULL.— One was seen on July 26, ten miles from the mouth, and another on August 2, about fifty-five miles from the mouth of the river.

4. **Larus argentatus.** HERRING GULL.— A few of these birds all in adult plumage were seen both along the main river and the branch stream.

5. **Sterna hirundo.** COMMON TERN.— Among the sand bars below the first fall a few Common Terns were seen and five or six from twenty to forty miles up the river.

6. **Mergus serrator.** RED-BREASTED MERGANSER.— A single bird was seen flying over the rapids of the fifth fall, another some seventy-five miles up, and one on the branch river. This one in female plumage flew ahead of the canoe, croaking hoarsely.

7. **Anas rubripes tristis.** BLACK DUCK.— The only Black Ducks I saw were in the branch stream on August 5, about forty miles from the sea. Here I came upon six birds and shot one, an adult female. The others were probably young birds, but all took to their wings after acting at first as if unable to fly. The bird I secured had a pale olive-green bill with a black nail; pale dusky brown or straw-colored tarsi and feet, without any hint of red, a buffy almost immaculate throat and dark crown and nape. The bird was a typical *tristis*. The breast was very dark and beautifully streaked.

8. **Clangula clangula americana.** GOLDEN-EYE.— A young bird unable to fly with a little natal down still about its head was secured in the main river. No others were seen here. In the branch stream on August 3, I came upon a mother and four nearly fully fledged young still unable to fly. The old bird crouched low in the water — her golden eyes showing very prominently, — and uttered hoarse rasping croaks. The young, whose eyes were gray-blue and inconspicuous, at once scattered, diving repeatedly and disappeared in the bushes, while the mother kept prominently in view within twenty yards of the canoe leading us down stream. After repeatedly swimming and flying short distances ahead of the canoe for half a mile or so, croaking all the time, she disappeared around a bend and undoubtedly flew back to the young. Near at hand the young made no sound, but at a distance a loud beseeching peep was uttered.

9. **Branta canadensis canadensis.** CANADA GOOSE.— Seven nearly grown young birds were found in the branch stream. They were able to progress over the water with great speed by use of the legs aided by the partly developed wings. No adults were seen.

10. **Botaurus lentiginosus.** BITTERN.— A single bird of this species was seen and thoroughly identified on August 3 as it jumped into the air within a few yards of the canoe on the branch stream. This is an interesting record as the previous ones are so meagre. Coues found a wing in the possession of a hunter in southern Labrador and Bigelow speaks of seeing two or three at Cape Francis.

11. **Pisobia minutilla.** LEAST SANDPIPER.— One was seen above the fifth falls on July 30.

12. **Actitis macularia.** SPOTTED SANDPIPER.—COMMON on the borders of the rivers and lakes.

13. **Ægialitis semipalmata.** SEMIPALMATED PLOVER.—One seen flying south over the river on August 6.

14. **Bonasa umbellus togata.** CANADA RUFFED GROUSE.—A family with half grown young was seen at the third falls on July 27, and another on July 31 about 75 miles up the river.

15. **Circus hudsonius.** MARSH HAWK.—A pair of Marsh Hawks were found at the mouth of the Natashquan River, and another inland from the village. This pair probably had young as one of them was very noisy, repeating the whinnying notes and launching itself to within thirty yards of me in a threatening manner whenever I entered a certain bog. This was on August 8 and 9. With the exception of the record by Mr. Bent and myself in 1909, Audubon's and Stearns' records are the only previous ones for this species.

16. **Accipiter cooperi.** COOPER'S HAWK.—One was seen near the fourth falls on August 7 and another, or the same bird, on July 30. Stearns is the only one who has previously recorded this bird.

17. **Buteo borealis borealis.** RED-TAILED HAWK.—A very dark bird of this species was seen for three days near a precipitous hill on the branch river. Only when seen from above could the red tail be distinguished; from below, the tail seemed nearly black. The Labrador form of the Canada Jay is somewhat darker than the same species elsewhere. This tendency to dark plumage is particularly marked in the Labrador form of the Horned Owl. It is possible that the same may be true of the Red-tailed Hawk of Labrador, although the individual that I observed may have been merely an exceptional case of melanism. This same tendency to darker plumage is suggested in the Flicker and Yellow Warbler as referred to later in this paper. Beebe has shown that a damp climate in itself, aside from other environment, tends to darkness in plumage, and the climate of Labrador in summer is damp.

The piercing cry of this Hawk, well described by Chapman as suggestive of escaping steam, was continually emitted whenever we appeared in the neighborhood. No nest could be found although the bird's actions suggested young. The only previous records of the bird are as follows: Audubon says "a tail feather of the Red-tailed Hawk, young, was found [near Cape Whittle]; therefore that species exists here." Palmer records that "two were seen at the Mingan Islands."

18. **Archibuteo lagopus sancti-johannis.** ROUGH-LEGGED HAWK.—At the fifth falls on July 30 I saw one and another on July 31 near Devil's Mountain. As it flew towards the cliffs it was greeted by a chorus of shrill whistles. No nest, however, could be seen.

19. **Falco columbarius columbarius.** PIGEON HAWK.—One seen on July 26 about ten miles from the mouth of the river.

20. **Pandion haliaëtus carolinensis.** OSPREY.—One or two were

seen at the mouth of the river, one about forty miles up, and one on the branch stream.

21. **Bubo virginianus heterocnemis.** LABRADOR HORNED OWL.— On August 3, a cloudy day, a bird of this species flapped and sailed across the branch river and alighted on a spruce within easy range of the canoe. Here he sat looking straight at us with wide open eyes, and at the same time I twice heard the call of another Owl in the distance. The bird proved to be a male in the sooty plumage characteristic of this race. As far as I know there are no previous identifications of this species so far to the southwest in the Peninsula.

22. **Ceryle alcyon alcyon.** BELTED KINGFISHER.— Common on the main river and the branch stream. The nesting hole of one was seen in a sand bank.

23. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— One was seen near the small river on August 5 and again on August 6.

24. **Colaptes auratus luteus.** NORTHERN FLICKER.— A pair were seen several times near the branch river, and one was heard calling at the fifth falls. I was unable to secure a specimen. One sent me by Dr. Grenfell from Sandwich Bay in 1908 was somewhat darker than the usual New England specimens.

25. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— A pair were seen on several successive days about some dead trees on the little river. The only previous record for Labrador is the statement of Audubon that he "found this species . . . on the coast of Labrador."

26. **Empidonax flaviventris.** YELLOW-BELLIED FLYCATCHER.— The characteristic whistling note of this species was heard several times, and an individual came on board the steamer off the western point of the peninsula on August 12.

27. **Perisoreus canadensis nigricapillus.** LABRADOR JAY.— This bird was more often heard than seen, and was fairly common.

28. **Corvus brachyrhynchos brachyrhynchos.** CROW.— The only Crows seen were four on the shore of the Bay of Seven Islands. No Ravens were seen.

29. **Loxia curvirostra minor.** CROSSBILL.— A flock of about fifty was seen on July 27.

30. **Loxia leucoptera.** WHITE-WINGED CROSSBILL.— One seen on July 30, and another came on board the steamer on August 12. This was a young bird with bill still uncrossed.

31. **Passerculus sandwichensis savanna.** SAVANNAH SPARROW.— These birds were common in the sand dune country at the mouth of the Natashquan river but were not found inland.

32. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.— One or two were seen or heard singing nearly every day near the rivers.

33. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.— Common; found in the thick spruce woods feeding young.

34. *Melospiza lincolni lincolni*. LINCOLN'S SPARROW.—Several were seen along both rivers. Two pairs acted as if they had young.

35. *Passerella iliaca iliaca*. FOX SPARROW.—Common at the mouth of the river and one was heard singing about 75 miles up stream. As the song season had practically ceased I may have overlooked many of these as of other species.

36. *Iridoprocne bicolor*. TREE SWALLOW.—An occasional individual of this species was seen from time to time flying over the rivers, four in all, and one was seen about the steamer off the Mingan Islands.

37. *Vermivora peregrina*. TENNESSEE WARBLER.—None were seen in the interior but on August 13 two in juvenal plumage came on board the steamer in a fog not far from Godbout.

38. *Dendroica æstiva æstiva*. YELLOW WARBLER.—Two of this species were seen on July 31 and August 1 about seventy-five or eighty miles up the river and the female secured. This specimen as well as an adult male taken at Esquimaux Point by Mr. Bent on June 10, 1909, and a young bird from North West River sent me by Dr. Grenfell, taken September 1, 1905, all appear somewhat darker and to have slightly thicker bills than those taken farther south. The number of specimens, however, is too small to afford any conclusions of value.

39. *Dendroica coronata*. MYRTLE WARBLER.—Only two Myrtle Warblers were seen on the trip.

40. *Dendroica magnolia*. MAGNOLIA WARBLER.—A common warbler along the river courses and still in feeble song up to the end of the first week in August.

41. *Dendroica striata*. BLACK-POLL WARBLER.—Only one bird was identified inland, but at the mouth of the river several were heard singing feebly on August 8 and 9. Either the birds inland had migrated, or had finished rearing their young and were moulting, concealed and silent. The season inland is earlier than on the coast at Natashquan, which is the westernmost point of the Arctic Coastal Strip.

42. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—This was the commonest warbler inland, and was almost everywhere in evidence owing to the constant chipping of the young calling for food. The adults sang occasionally up to the last of July. Mr. Bent and I found this bird abundant on the southern coast in 1909, but previous to this time there had been but three records for the whole of Labrador, one taken at Esquimaux Point by Frazar, and two seen at the Mingan Islands by Palmer. The breeding of this bird in the same region with such Hudsonian species as the Lincoln's and Fox Sparrows and the Labrador Horned Owl is interesting and surprising. The Check-List states that it is a bird of the 'Lower Canadian and Transition Zones.'

43. *Setophaga ruticilla*. REDSTART.—Several were seen near the landing wharf for Clark City at the Bay of Seven Islands on July 23. They were in song.

44. **Sitta canadensis.** RED-BREASTED NUTHATCH.—None were seen on shore, but on August 11, off Moisie, five of this species, one adult, the others immature, came on board the steamer in a fog and remained on board two days. They were extremely tame and crept about the deck, and on the ropes and spars, sometimes within a few inches of the passengers. One alighted on the coat-collar of a sailor as he was lighting his pipe, and another on my shoulder as I stood on the bridge. I put my hand near the adult Nuthatch on the rail and he picked at my finger; then he flew into the captain's cabin and gathered insects from the window. There were many small dead moths on board that seemed to be particularly relished. I noticed two Nuthatches on the chains of the smoke stack undisturbed by the constant vibrations, and, what is still more surprising, by the deafening steam fog-horn that was blown at frequent intervals within a few feet of them.

45. **Penthestes atricapillus atricapillus.** CHICKADEE.—On an island at the fourth falls on July 28 I saw and clearly identified one of this species while I was watching a small band of Hudsonian Chickadees. The previous records for the Labrador Peninsula are few and unsatisfactory.

46. **Penthestes hudsonicus hudsonicus.** HUDSONIAN CHICKADEE.—Common inland.

47. **Regulus satrapa satrapa.** GOLDEN-CROWNED KINGLET.—One or two individuals only were seen.

48. **Regulus calendula calendula.** RUBY-CROWNED KINGLET.—This bird, found so commonly in 1909, had evidently finished its nesting season and was rarely in evidence. On August 5, I heard a feeble attempt at song.

49. **Hylocichla guttata pallasi.** HERMIT THRUSH.—Common all along the courses of the rivers, but not in full song.

50. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.—Common and in partial song.

51. **Planesticus migratorius migratorius.** ROBIN.—Several were seen near the mouth of the Natashquan River, and two were seen near the small river about forty miles inland.

In all 74 species were seen on the coast and in the interior.

Additional Notes.

At Natashquan, Mr. Richard Joncas, the head of the Labrador Fur Company, to whom I am indebted for many kindnesses, has a mounted Pintail, *Dafila acuta*, shot at that place in 1911. This is the ninth record for Labrador.

I am able to give the first definite record of the Wood Duck, *Aix sponsa*, for the Labrador Peninsula, namely an adult male speci-

men caught in a muskrat-trap at Long Point on July 1, 1912, and brought to Robert Smith of Mingan, who presented it to M. Johan Beetz of Piashte-bai in whose collection it now is. This brings the number of species and subspecies for the Labrador Peninsula up to 219.

In letters to me from Dr. W. T. Grenfell under dates of October 4 and 17, and November 5, 1912, the following records are of interest:

A female Morning Dove, *Zenaidura macroura carolinensis*, found dead on the beach at Spotted Islands in August, and another seen alive at Battle Harbor on October 2, 1912. There are only two previous records for Labrador.

Seven Eskimo Curlew, *Numenius borealis*, shot and one other seen on the beach at West Bay north of Cartwright in August and September, 1912. The skins of five were saved and sent to Cambridge where they were seen and identified by Mr. Wm. Brewster.

This record of the Eskimo Curlew is of great interest for there has been no other authentic record since September 14, 1909, and the species was believed to be extinct. It was a great pity that the few survivors of this interesting species should be shot either for specimens or for food. I would suggest that the bird be put on the protected list at all times in the United States and Canada wherever it is possible to pass such a law, that all offers of money for specimens by collectors be at once withdrawn, and that Dr. Grenfell be asked to distribute notices along the Labrador Coast to the effect that no specimens will be paid for, and urging the inhabitants not to shoot any Curlew in order if possible to save the species from extinction.

NOTES ON THE PANAMA THRUSH-WARBLER.

BY HUBERT LYMAN CLARK.¹

THANKS to the kindness of Mr. Outram Bangs, I have recently had the opportunity of examining some fine alcoholic material of the Panama Thrush-Warbler, *Rhodinocichla rosea eximia* Ridgway. Mr. Bangs called my attention to the fact that the systematic position of this bird is still unsettled and he suggested that a study of some of the anatomical details of its structure might throw light on its relationships. For his kindness in placing the material in my hands, without restrictions, and for the loan of skins of several other genera which I wished to examine, I desire to express here my hearty thanks to Mr. Bangs.

I should be rash indeed if I expected to actually settle, by these notes, the systematic position of *Rhodinocichla* for like many another genus of Passerine birds, this one approaches more or less nearly several different families and with which one it is most closely affiliated is largely a matter of opinion. All I hope to do is to point out some features of the anatomy not previously known, summarize those which have been described, and express my own opinion as to the relationship which these facts seem to indicate.

Bill. The bill is rather slender, about 18 mm. long, 5 mm. wide at base and 8 mm. deep at the same point. The upper mandible is distinctly curved but the lower is remarkably straight. The tomia are entire with neither tooth nor notch, and the same is true of the edges of the upper mandible except near the tip, where there is a large, rounded notch. This notch is exactly like that which is found in the same position in the bill of certain tanagers, *Eucometis*, *Mitrospingus*, etc. Indeed, the bill of *Rhodinocichla* is more like that of *Mitrospingus* than like that of any other bird with which I have compared it.

Nostrils. The nostrils show no distinctive character. They are ellipsoidal, longer than high and quite bare; the skin back of

¹ Read at the meeting of the American Ornithologists' Union, November 13, 1912.

them is free from feathers for a couple of millimeters. There is no projecting ridge or fold above them such as occurs in many Mniotiltidæ. In *Eucometis* and *Mitrospingus*, the feathers come close up to the posterior end of the nostril.

Tongue. The tongue ends in two points, one on each side; there is a series of fine teeth or serrations on each side, each tooth being larger than its proximal neighbor, so that the terminal tooth is the largest. Sometimes the two terminal teeth on each side are of equal size. This sort of a tongue occurs in many Passerine birds which have no close relationship, as the Catbird and the Scarlet Tanager. It is not therefore in any way distinctive.

Pterylosis. The head is fully feathered with no special apteria nor is there any unusual arrangement of feathers in longitudinal series. The upper cervical tract is narrow at first but becomes broader and more densely feathered between the shoulders and then becomes narrow again before joining the dorsal tract. This enlargement of the cervical tract is the only characteristic feature of the general pterylosis. It has not been reported for any other Passerine bird so far as I know, but a somewhat similar arrangement is found in the kingfishers. The cervical tract anterior and posterior to this enlargement is, in *Rhodinocichla*, only three or four feathers wide but the enlargement is six feathers wide. The rhombic dorsal saddle is well-marked and symmetrical and resembles that of *Piranga erythromelas* and many other Passeres. The pterylosis of the lower surface shows no peculiarities save that the ventral tracts are unusually short, narrow and ill-defined. The primaries are rather short and the secondaries long, giving the wing the short, rounded shape characteristic of the genus. The really remarkable fact here is the shortness of the eighth and ninth primaries. In the Mniotiltidæ (with few exceptions) and in most tanagers, the eighth primary is one of the longest and the ninth is little shorter and is longer than the fourth, but in *Rhodinocichla* the eighth and ninth primaries are the shortest and the ninth is even shorter than the secondaries. A very similar arrangement of primaries is however found in *Mitrospingus* which has the ninth primary shortest and the eighth only a little longer, though it exceeds the first. In *Eucometis*, the ninth is longer than the first and second, while the eighth is not much shorter than the fifth, sixth

and seventh. In *Piranga*, the wing is pointed by the ninth, eighth and seventh primaries, the other extreme from *Rhodinocichla*. The latter has nine secondaries and a quintocubital wing of course. There are twelve rectrices which are successively shorter from the middle pair outward. These feathers are notable for their breadth and softness; it is interesting to find the tail feathers of *Mitrospingus* similar.

Alimentary Canal. The arrangement of the intestine and the appearance of the entire alimentary canal is so similar to that of several other Passerine birds examined, *Dumetella*, *Piranga*, *Sciurus*, that no distinctive characters were found. The contents of the stomach were examined in two specimens and while much of the material was unrecognizable to my untrained eye, three items were determined; beetles of at least four species, one of which was a curculio; seeds, of which the most common was the hard gray achene of some sedge; large, irregular grains of sand, with rounded angles and of a bright ochre color. This combination seems to show clearly that the birds are chiefly ground feeders.

Palatine Region. The bony palate of *Rhodinocichla* yields what seems to me the best indication of its relationships. If one compares this part of the skull in tanagers and in wood warblers, two points of difference are shown which seem to be important. In the tanagers, the palatine processes are long and well developed while in the wood warblers they are short and rudimentary. In the tanagers, the maxillo-palatines are parallel for a short distance, about the length of the inflated portion, but in the warblers they are parallel for a considerable distance and the increasing divergence is less marked. Parker¹ examined and figured several species of each family, and I have examined *Piranga erythromelas* and *Sciurus noveboracensis* in addition, and these differences while not ex-

¹ Parker, W. K., 1878, Trans. Zool. Soc. London, vol. 10, pp. 251-314, pls. 46-54. Compare especially figs. 1-6, pl. 46 and figs. 1-3, pl. 48. It may be remarked in passing that Parker makes no reference to a "secondary palatine process" in *Piranga*, although he examined *Piranga rubra*. Shufeldt figured these processes as found in *Habia* (Auk, Vol. 5, p. 439; 1888) and gave them a name. I find them very conspicuous in *Piranga erythromelas* and on consulting Lucas' figure (Proc. U. S. Nat. Mus., vol. 18, p. 505; 1895) it will be seen that he indicates them although he makes no reference to them. There is no trace of them in *Sciurus* or *Dumetella*, nor in *Rhodinocichla*. They appear to be associated with a strongly conirostral beak, though Shufeldt says they are lacking in *Coccythraustes*.

traordinary seem fairly constant. They show more clearly in specimens than in Parker's figures, especially the position of the maxillo-palatines. Now in both these particulars, *Rhodinocichla* is a tanager. The palatine processes are well-developed though not as slender as in *Piranga*, nor as spike-like as Parker figures them for *Tanagra*. The maxillo-palatines are almost exactly like those of *Piranga erythromelas* both in form and position.

Sternum. Some years ago Shufeldt (1888, Auk, vol. 5, p. 442) made the statement that true tanagers "have an osseous bridge extending across the top of the manubrium to the anterior margin of the body of the sternum." He adds that it is absent in *Icteria* and in such Fringillidæ as he had examined. This seems such a trivial character and so unlikely to be constant or clearly shown, that I was inclined to give little heed to it. Nevertheless I made some dissections with the result, surprising to me, of finding this osseous bridge very clearly defined in *Piranga* and totally wanting in *Dumetella*, *Habia*, *Passerella* and *Sciurus*. I am forced to believe therefore that it is a character of no little importance, and it is interesting to find that in *Rhodinocichla*, this osseous bridge is as clearly shown as it is in *Piranga*.

Conclusions. In the British Museum catalogue (1881), Sharpe calls *Rhodinocichla* the "rose-breasted wren" and places the genus in the Miminæ near *Harporhynchus*, remarking that it is one of several genera which appear to connect the mocking-thrushes and the wrens. It was not until 1901 that Ridgway called attention to the important fact that there are only nine developed primaries in *Rhodinocichla* and that it must therefore belong in some one of the nine-primaried groups. He placed it finally at the end of the Mniotiltidæ with the comment that although it "is very aberrant as a member of the Mniotiltidæ, I do not know where else to place it." When Mr. Bangs placed the alcoholic specimens in my hands, he called my attention to the resemblance to *Mitrospingus* and suggested the possibility of *Rhodinocichla* being a tanager. The evidence which I have presented seems to me to justify the belief that this suggestion has revealed the probable relationships of the genus. The structure of the bony palate and of the sternum are characteristically tanagrine, while the wing and tail show a close relationship to *Mitrospingus*, which has quite generally been re-

garded as a tanager. It is true that the bill is not typically tanagrine but here again there is a close resemblance to *Mitrospingus*. It is a natural conclusion therefore that *Rhodinocichla* is to be regarded as a tanager which has become more or less specialized for a particular manner of life. As the stomach contents indicate a ground feeder, it may be that that method of finding its living has been the factor associated with its specialization.

EIGHTEEN SPECIES OF BIRDS NEW TO THE PRIBILOF ISLANDS, INCLUDING FOUR NEW TO NORTH AMERICA.¹

BY BARTON WARREN EVERMANN.

WITH the appointment of a naturalist in the fur-seal service July 1, 1910, and the organization, in the Bureau of Fisheries, of the Alaska Fisheries Service, July 1, 1911, the Bureau at once began the formation of plans for a comprehensive and thorough study not only of the life history of the fur seal but also of the scientific management and conservation of the fur-seal herd that has its breeding grounds on the Pribilof Islands in Bering Sea. The plan is broad in its scope and contemplates a thorough study of all the species of animals and plants found on or about those islands. Dr. Walter L. Hahn, at that time head of the department of biology in the state normal school at Springfield, South Dakota, was appointed naturalist in the summer of 1910. He arrived at St. Paul Island August 24 and immediately entered upon his duties with an energy and intelligence which could scarcely be excelled. His untimely death on May 31, 1911, from exposure in the ice-cold water of the village lagoon, resulting from the capsizing of a boat, was a severe loss to the fur-seal service and to biological science. During his few months on St. Paul Island Dr. Hahn, from the

¹ Published with the permission of the U. S. Commissioner of Fisheries.

voluminous notes and records which he left, appears to have been indefatigable in his field work and marvelously painstaking in recording his observations. His notes, typewritten up to noon of the very day of his death, record a vast number of new and important observations on the fur seals and blue foxes. They also teem with records of interesting observations on the birds and other animals of the islands.

Mr. Millard C. Marsh, pathologist of the Bureau of Fisheries, was appointed to the vacancy caused by the death of Dr. Hahn. He reached St. Paul Island, August 23, 1911, and took up and continued with commendable industry and intelligence the work so ably begun by his predecessor.

Among the observations that are of special interest to the readers of 'The Auk' are those relating to birds.

In this communication I desire to record the species which their observations have thus far added to the Pribilof Islands and to the avifauna of North America.

In Palmer's 'Avifauna of the Pribilof Islands,'¹ 69 species of birds are recorded. To these, one species, the Northern Flicker, *Colaptes auratus luteus*, has since been added by assistant fur-seal agent James Judge, and recorded by Mr. Austin H. Clark.²

To this number I am now able to add 18 species, four of which are new to North America. All the specimens mentioned are now in the United States National Museum.

For assistance in verifying the identifications of these specimens I am under obligations to Mr. Harry C. Oberholser of the Bureau of Biological Survey.

1. **Rhodostethia rosea** (*Macgillivray*). ROSS'S GULL.—A fine example in adult plumage was shot on one of the small freshwater lakes of St. George Island, May 25, 1911, by one of the natives. The specimen was preserved by Assistant Agent A. H. Proctor who forwarded it to the Bureau of Fisheries.

This species was first obtained in Alaska by Nelson, October 10, 1879. Since then it has been recorded by Murdock from Point Barrow.³

¹ The Fur Seals and Fur-Seal Islands of the North Pacific Ocean, Part 3, pp. 355-431, 1899, Government Printing Office.

² Proc. U. S. Nat. Mus., Vol. 38, p. 60, 1910.

³ Nelson, Report upon Natural History Collections made in Alaska between the years 1877 and 1881, Government Printing Office, 1887.

2. **Mergus serrator** *Linnaeus*. RED-BREASTED Merganser.— A female (No. 55)¹ shot by Dr. Morgan December 16, 1910, on the lagoon, St. Paul Island, and preserved by Dr. Hahn.

Although a common species in many parts of Alaska it had not been previously noted on the Pribilof Islands.

3. **Chaulelasmus streperus** (*Linnaeus*). GADWALL.— A female in good plumage (No. 101) was shot on the lake near Polovina, St. Paul Island, November 13, 1911, by Mr. Marsh who thinks the species is probably not uncommon, but that most of the natives do not distinguish it from the female Mallard.

Among the ducks collected by Dr. Hahn is also a fine male (No. 66) of the European Widgeon, *Mareca penelope*, taken April 30, 1911, which, however, had been previously recorded from these islands.

4. **Spatula clypeata** (*Linnaeus*). SHOVELLER.— A male (No. 74) in excellent plumage obtained May 24, 1911, on St. Paul Island, by Dr. Hahn. Stomach contained larvæ and small seeds.

5. **Dafila acuta** (*Linnaeus*). PINTAIL.— Two males (Nos. 178 and 179) in perfect plumage, were obtained by Mr. Marsh May 24, 1912, at the village pond, St. Paul Island.

6. **Marila marila** (*Linnaeus*). SCAUP DUCK.— A fine specimen, a male (No. 153) of the Scaup Duck or Big Bluebill, was secured on the village pond, St. Paul Island, by Mr. Marsh, April 27, 1912.

7. **Marila fuligula** (*Linnaeus*). TUFTED DUCK.— This interesting duck I am now able to add to the North American avifauna. A female (No. 69) was obtained on St. Paul Island May 9, 1911, by Dr. Hahn who was at first inclined to identify it as an example of the Little Bluebill or Lesser Scaup Duck, *Marila affinis*.

Dr. Hahn states that the stomach was full of grass, cress (?), small seeds and a few larvæ. There was but little fat. The eggs measured 4 mm. in diameter. The bird was accompanied by the male which escaped.

8. **Marila ferina** (*Linnaeus*). EUROPEAN POCHARD.— A male (No. 158) in excellent plumage obtained on St. Paul Island by Mr. M. C. Marsh May 4, 1912. Mr. Marsh states that this duck is "seen occasionally by natives not all of whom recognize it." It is not improbable that they confuse it with other species.

This is the first North American record for this species.

9. **Somateria spectabilis** (*Linnaeus*). KING EIDER.— Although the Pacific Eider had been recorded from these islands, not until now has the King Eider been known to occur there. The collections sent down by Mr. Marsh contain 3 fine specimens of this species, male and female, (Nos. 129 and 132) taken February 4, 1912, and a male (No. 128) taken March 9, 1912, all on St. Paul Island.

10. **Pelidna alpina sakhalina** (*Vicillot*). RED-BACKED SANDPIPER.— One specimen a male, (No. 42) was shot on St. Paul Island, October 30,

¹ The numbers in parentheses are the collector's original numbers.

1910, by Dr. Morgan. On December 11, 1910, Dr. Hahn saw three others which he believed to be this species.

11. **Machetes pugnax** (*Linnaeus*). RUFF.—A young female (No. 22) was secured on St. Paul Island, September 7, 1910, by Dr. Hahn. This is not only the first record of this common European bird for the Pribilof Islands but it is the first for the west coast of America.

12. **Cryptoglaux funerea funerea** (*Linnaeus*). TENGMALM'S OWL.—A female (No. 59) in good condition caught alive in the village on St. Paul Island, January 26, 1911, by a native who brought it to Dr. Hahn. The stomach was empty save for a few hairs. This is the first record for America of this interesting little Owl.

13. **Cryptoglaux funerea richardsoni** (*Bonaparte*). RICHARDSON'S OWL.—A male (No. 111) was shot with a rifle on St. Paul Island February 2, 1912. Although previously known from Alaska this is the first record for the Pribilof Islands.

14. **Euphagus carolinus** (*Müller*). RUSTY BLACKBIRD.—One specimen a male, (No. 99) was obtained near the lake at Northeast Point, St. Paul Island, October 20, 1911. It was shot with buckshot by one of the native watchmen, who brought it to Mr. Marsh. The bird was unknown to the natives.

15. **Coccothraustes coccothraustes japonicus** *Temminck & Schlegel*. JAPANESE HAWFINCH.—A fine example (No. 100) of this interesting Finch new to the American fauna was shot at the village landing on St. Paul Island, by a native, November 1, 1911. It was a new bird to the natives, none of them recognizing it as anything they had ever seen before.

16. **Plectrophenax nivalis nivalis** (*Linnaeus*). SNOW BUNTING.—In 1887 Mr. Ridgway described the Snow Bunting common on the Pribilof Islands as *Plectrophenax nivalis townsendi*.

It was therefore with considerable surprise that, among five specimens of Snow Buntings received from Mr. Marsh one (No. 172) proves to be the typical species. It is a male caught alive in the village of St. Paul March 31, 1912. The other four specimens are typical *P. n. townsendi*.

17. **Zonotrichia leucophrys gambeli** (*Nuttall*). GAMBEL'S SPARROW.—An adult male (No. 180) in fine plumage was obtained by Mr. Marsh, May 24, 1912, on St. Paul Island.

18. **Passerella iliaca insularis** *Ridgway*. KADIAK FOX SPARROW.—One male, (No. 15) was shot among the rocks near Gorbach rookery, St. Paul Island, September 7, 1910, by Dr. Hahn. High northeasterly winds had prevailed for several days. On October 4, another was seen near where the one was killed a month earlier. Still another was seen the same day among the rocks back of Reef rookery, and on October 15, one was seen among the rocks at Kaminista, St. Paul Island, by Dr. Hahn. Mr. Oberholser identifies the single specimen as *P. i. sinuosa* Grinnell which is not regarded as separable from *insularis* in the A. O. U. Check-List.

AN ESSEX COUNTY ORNITHOLOGIST.¹

BY GLOVER M. ALLEN.

IN 1905 the Nuttall Ornithological Club published as No. 3 of its *Memoirs*, Dr. Charles W. Townsend's 'Birds of Essex County,' the most extensive monograph that had up to that time appeared on the birds of so limited an area of North America. The large number (319) of species which it includes, bears witness not only to the many observers whose notes were available but also to the variety of conditions obtaining in this favored portion of Massachusetts whereby so great a multitude of birds is attracted. Certain species (as the Orchard Oriole, Yellow-breasted Chat, Long-billed Marsh Wren) whose habitat lies chiefly to the south are here at about their northeastern breeding limit, while others, characteristic of more boreal conditions (as Solitary Vireo, Hermit Thrush), find local spots suited to their needs.

The present paper is a further contribution of notes on Essex County birds, gleaned from the records and collections of the late Benjamin F. Damsell, of Amesbury, in the northernmost part of the County. Although a life-long student of birds, he was practically unknown among ornithologists for he published nothing and carried on his studies by himself in a quiet way. At his death, his collections and his note books covering nearly thirty years of continuous observation in the vicinity of his home, passed into the hands of his nephew, Mr. Howard D. Kenyon, of Sharon, Mass., through whose kindness I have been permitted to examine them. Many of the notes are of much local interest and it has seemed worth while to place on permanent record such of these as add to what has been published in the 'Birds of Essex County,' that his labors be not altogether lost. Of Mr. Damsell's life, Mr. Kenyon has most kindly written the following brief sketch.

"Benjamin F. Damsell was born Sept. 6, 1854, in Amesbury, Mass., the son of Thomas and Jane Damsell. He was educated in the public schools of Amesbury and early showed a taste for

¹ Read before the Nuttall Ornithological Club, May 6, 1912.

drawing. His sketches of birds and mammals gave indication that the boy was a good observer with unusual artistic ability. His father was a taxidermist on a small scale and from him Benjamin gained his inspiration for collecting and mounting specimens. His first attempt to stuff a bird seems to have been at the age of twelve years.

"Both parents died in 1866, the home was broken up, and the boy went to a farm to live. Here among the hills where Massachusetts joins New Hampshire, Mr. Damsell started his collection and began the study of ornithology. Among his first books on the general subject of bird-lore was Cassell's 'Book of Birds.' While at the farm his outings took the form of tramps through the woods, for the purpose of studying the birds and adding to his collection. His early advantages were few, but his natural ability, his love for the subject, and his determination to do good work knew no obstacles. In his early days in taxidermy, he bought stuffed specimens and took them apart to study the methods of those who were considered expert. While yet a farmer's boy his pencil sketches of birds and squirrels were replaced by successful efforts at oil painting.

"Tiring of the limitations of farm life he learned the carriage builder's trade. In 1881 he married Miss Emma F. Day, of Amesbury, and continued to reside in his native town.

"For years he reserved Saturdays for hunting trips. Oftentimes when business was dull a large portion of his time was given to taxidermy and painting. All his work seemed to combine the skill of the mechanic with the touch of the artist. He bought the best books, studied the best methods, with the result that his knowledge of birds was comprehensive and exact.

"Most of his hunting was done in the vicinity of Amesbury and on the great meadows of Salisbury and of Hampton, N. H. For forty years he continued to study, collect, and mount specimens. His collection was reasonably complete in those birds that frequent northeastern Massachusetts and his notes were kept until within a few weeks of his death. He was well known as a taxidermist in the nearby towns of Newburyport, Haverhill, Hampton, and Exeter.

"After an illness of several months he passed away June 8, 1911.

His attainments were such that had he not chosen to live the quiet, retired life of his native hills, he would have won distinction in the artistic and mechanical side of taxidermy. By those who knew him he will ever be remembered as a man of unusually lovable qualities and nobility of character."

The notebooks, from which the following items are abstracted, cover the period from 1880 to 1911, and though at first confined to records of birds shot, became later more systematic, with entries of all dates on which the different species were seen or killed. Beyond this there is rarely more than an occasional remark concerning some unusual circumstance, except for dates when birds were seen mating or when eggs were found. In addition to the notes on birds, several pages in some years are given to lists of local trees with dates on which they first bloomed or put out their leaves, when the first thunder shower occurred, the first frogs were heard, and the like. The bird records seem to be made with much caution and as they are frequently substantiated by the actual specimen, may in most cases be deemed wholly trustworthy. Part of the collection was destroyed but the remainder is in good condition and consists of several hundred mounted specimens, some of the more interesting of which have been acquired by the Boston Society of Natural History for its New England collection.

In the paragraphs which follow, it is to be understood that unless definitely mentioned, the locality is Amesbury, Mass., or the immediate vicinity

1. ***Uria lomvia lomvia***. BRÜNNICH'S MURRE.—An unusually early date of appearance is November 9, 1901. Late November is the usual time for this bird on our coast. The first fall arrival is noted on November 24, 1890, and November 28, 1893.

2. ***Sterna hirundo***. COMMON TERN.—The increase in numbers of this species on our coast of late years due to the protection afforded the breeding birds is evidenced by the entries in the notebooks. Although rarely recorded in summer previous to 1906, yet after that date it regularly appears during late July and in August.

3. ***Oceanodroma leucorhoa***. LEACH'S PETREL.—On October 16, 1887, one was shot at Kimball's Pond, a large body of fresh water a short distance inland. It is a striking fact that the inland records for this bird in New England are mainly of specimens seen on ponds or rivers during the middle of October. Possibly these petrels are then in active migration south and at that time more frequently wander or are blown inland.

4. **Phalacrocorax carbo.** CORMORANT.— An interesting case is recorded of a Common Cormorant that was seen to be harassed by two Kingbirds at Amesbury on June 18, 1895. It sought refuge in an oak tree and fell to the ground where it was captured. An examination showed that one wing had been broken but had healed. The bird was a male.

5. **Phalacrocorax auritus auritus.** DOUBLE-CRESTED CORMORANT.— A midsummer bird is noted as shot at Kingston, N. H., July 10, 1891.

6. **Pelecanus occidentalis.** BROWN PELICAN.— An immature bird, taken May 1, 1907, off Great Boar's Head, Hampton Beach, N. H., was mounted by Mr. Damsell, and later purchased by Col. John E. Thayer who presented it to the Society. It has not apparently been recorded.

7. **Anas platyrhynchos.** MALLARD.— Occasionally taken, in one instance a late male, on December 2, 1904. A pair shot at True's Pond, October 16, 1893, weighed — the drake $2\frac{1}{2}$ pounds; the duck 2 pounds.

8. **Nettion carolinense.** GREEN-WINGED TEAL.— An early record is of one shot March 23, 1889. In 1898, one was killed on December 2.

9. **Querquedula discors.** BLUE-WINGED TEAL.— The only spring specimens noted are: one on March 21, 1898, and a male, April 24, 1897.

10. **Spatula clypeata.** SHOVELLER.— This unmistakable species is twice recorded, once in spring, April 6, 1893, and once in fall, September 3, 1894. Both dates extend those recorded for Essex County.

11. **Aix sponsa.** WOOD DUCK.— A late bird is noted on December 16, 1903.

12. **Marila americana.** REDHEAD.— A single specimen was taken October 14, 1893.

13. **Marila collaris.** RING-NECKED DUCK.— But one record is given for Essex County in Dr. Townsend's memoir. Mr. Damsell, however, has a record of a bird on April 7, 1889.

14. **Somateria dresseri.** AMERICAN EIDER.— The collection contains several specimens of this duck, and the notebooks record it once as early as September 20, 1903, an unusually forward bird.

15. **Somateria spectabilis.** KING EIDER.— The single record for Essex County is the specimen taken at Marblehead, November 24, 1889. It is therefore of interest to find that a second was shot at nearly the same time by Mr. Damsell, namely on November 29, 1889. It was a young male.

16. **Chen hyperboreus hyperboreus.** LESSER SNOW GOOSE.— A Snow Goose, shot October 7, 1888, is among the birds whose measurements are entered in one of the notebooks. The wing length is there recorded as $14\frac{1}{2}$ inches, which indicates the Lesser Snow Goose. In the notebook for 1902, is the entry: "Albert Shaw shot a Snow Goose," but the exact date, if known, was not recorded. A further entry records, February 18, 1902, "Saw a flock of Snow Geese."

17. **Anser albifrons gambeli.** WHITE-FRONTED GOOSE.— Previous to 1905, there were no records of this bird for Essex County. Mr. Damsell

notes two, however, that were killed on the Salisbury marshes October 5, 1888.

18. ***Ixobrychus exilis***. LEAST BITTERN.—Records for this elusive bird are few in the northeastern extreme of its range. Mr. Damsell's notebooks record it twice in fall: September 21, 1887, and September 1, 1888.

19. ***Herodias egretta***. AMERICAN EGRET.—A 'white heron' shot September 19, 1887, is recorded, together with measurements of the bird. The wing, 16 inches, and tarsus, 6 inches, indicate that it was *H. egretta*. The notebooks also record another white heron at Salisbury, August 5, 1907.

20. ***Rallus elegans***. KING RAIL.—A specimen is noted on August 14, 1902.

21. ***Gallinula galeata***. FLORIDA GALLINULE.—Most of the few records for Essex County are of October birds. Mr. Damsell's collection contained two birds, one taken September 14, 1887, the other October 3, 1903.

22. ***Lobipes lobatus***. NORTHERN PHALAROPE.—Data on the occurrence of these birds are always interesting. I find one spring record, May 18, 1904; and one of a bird 'in full plumage' (and so perhaps a care free female) on July 31, 1905, a rather early date.

23. ***Recurvirostra americana***. AMERICAN AVOCET.—The collection contains a fine adult female of this species, taken May 23, 1887, doubtless on the Salisbury marshes. That it was a locally obtained specimen there can be no doubt, as it was skinned, sexed and measured by Mr. Damsell. His notebook simply makes record of it as the first of its kind observed, for in these earlier days of his collecting he seems not to have been aware of the rarity of his capture. The specimen has been acquired by the Boston Society of Natural History for its New England Collection. There are but three other instances on record of the appearance of this species in Massachusetts, one of which is indefinite and the others of fall birds. That this straggler should have appeared in spring is therefore of unusual interest.

24. ***Philohela minor***. WOODCOCK.—The notebooks contain a number of records of late fall birds, as follows: November 20, 1886, December 10, 1887, November 21, 1880, November 18, December 6, 1890, November 30, 1893, December 5, 1903.

25. ***Gallinago delicata***. WILSON'S SNIBE.—Dr. Townsend indicates that this bird is occasional in winter in Essex County. Mr. Damsell notes one November 24, 1896, at Amesbury; and records one shot at Newburyport on February 8, 1889.

26. ***Micropalama himantopus***. STILT SANDPIPER.—The notebooks extend somewhat the limits of the fall migration of this species as recorded for Essex County, viz., July 22 to September 16. Thus I find entry of specimens shot September 15, and 17, 1893, and October 2, 1895.

27. ***Limosa fedoa***. MARBLED GODWIT.— This bird is now so rare as to be considered 'accidental' in Essex County. It is therefore worth noting that one was shot July 28, and another July 30, 1888.

28. ***Limosa hæmastica***. HUDSONIAN GODWIT.— 'Large flocks' are recorded September 7, 1891, and single birds shot August 24, 1889, August 31, and September 2, 1903.

29. ***Bartramia longicauda***. UPLAND PLOVER.— A very late bird is one shot by William Thompson on October 26, 1901. In 1896, there are records of this species at Amesbury on July 10, and in August, but in other years rarely more than once in the late summer.

30. ***Numenius americanus***. LONG-BILLED CURLEW.— There are two records for this bird in the notebooks, namely of specimens taken probably on the Salisbury marshes, July 21, 1887, and July 25, 1891. Although the Hudsonian Curlew is often mistaken for this species by gunners, I am confident that these records may stand.

31. ***Numenius hudsonicus***. HUDSONIAN CURLEW.— The notebooks contain frequent mention of this species among birds shot in August and early September. A flock of thirty was seen August 2, 1907.

32. ***Numenius borealis***. ESKIMO CURLEW.— A few additional records for this nearly or quite extinct species are: August 31, 1889, 'shot one in the marsh'; August 28, and 29, 1893, specimens shot. There are no records in the books of later date.

33. ***Charadrius dominicus dominicus***. GOLDEN PLOVER.— The only spring record is May 18, 1903, and may, I think, be accepted as the bird was thoroughly familiar to Mr. Damsell.

34. ***Oxyechus vociferus***. KILLDEER.— The memorable winter flight of these birds in 1888 was noticed at Amesbury, where on December 4, four were shot, and two the following day. In 1884, a bird was shot on the marsh in August, and in 1895 one is recorded November 25.

35. ***Colinus virginianus virginianus***. BOB-WHITE.— Essex County is close to the critical limit for this species in its northeastward range. In the notebooks, it is entered nearly every year among the birds seen about Amesbury, but after 1905, it appears no more.

36. ***Ectopistes migratorius***. PASSENGER PIGEON.— Mr. Damsell was quite familiar with this species and the Mourning Dove, and his collection contains specimens of both, locally obtained. Of the Pigeon, a male and a female were shot on August 24, 1886. In 1887, the species is entered twice, on April 23 and November 29. The year 1888 is the last year in which the Passenger Pigeon was observed, a flock of five on May 6. This was about the year when the bird practically disappeared from New England.

37. ***Zenaidura macroura carolinensis***. MOURNING DOVE.— One is recorded February 24, 1890, and another January 9, 1892; the extreme dates for this bird are, with these exceptions, March 31 to November 2, (1894).

38. **Buteo lineatus lineatus.** RED-SHOULDERED HAWK.— The occasional gathering of this species into large companies during migration, was noticed on September 18, 1886, when a 'flock of about 300' passed at Amesbury.

39. **Haliaeetus leucocephalus leucocephalus.** BALD EAGLE.— The notebooks contain several winter records for this bird, whose occasional appearance is always a matter of interest. In 1890, 'one dark and two white-headed birds' were seen March 1, and a single bird May 30. In 1891 there are records for February 7, July 15, August 3 and 11, December 20. In 1903, one was seen, January 5, at Hampton, N. H. These winter records are of interest as showing the bird's occasional presence on the coast during the winters, while inland among the mountains and lakes of New Hampshire they are summer visitors.

40. **Scotiaptex nebulosa nebulosa.** GREAT GRAY OWL.— An unrecorded specimen of this rare owl was in Mr. Damsell's collection, and has been acquired by the Boston Society of Natural History. It was shot January 6, 1894, in the Great Swamp at Amesbury.

41. **Cryptoglaux funerea richardsoni.** RICHARDSON'S OWL.— Two mounted specimens obtained in the vicinity of Amesbury are in the collection; the first was taken February 25, 1889, the second, a male, on January 5, 1903.

42. **Nyctea nyctea.** SNOWY OWL.— Although generally considered a very irregular winter visitor, it is worthy of note that it is almost yearly recorded in the notebooks. The years and dates are given in full in case they may have value in connection with the notices of flights recorded by Mr. Ruthven Deane. They are: 1886, November 26, December 10; 1887, February 10; 1889, November 8; 1890, January 23, February 13 (Hampton River, N. H.), November 28, December 6, 11, 20, 24; 1891, December 16; 1893, November 7; 1896, November 16, ♂; 1901, December 26, two, December 28; 1902, January 3, 11, 18, 25, February 3, 4, April 3, October 18, 23; 1903, March 12; 1905, November 21.

43. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.— The Black-billed is the Cuckoo commonly represented in Essex County, while the Yellow-billed species more rarely reaches northern Massachusetts and southern New Hampshire. This is shown well by Mr. Damsell's records, in which the latter bird is entered but five times in seventeen years. In 1884, one was shot May 23, and a second on June 14. In 1901 a nest and eggs were found on June 24. A bird was taken August 24, 1903, and the final one noted May 17, 1906.

44. **Dryobates villosus villosus.** HAIRY WOODPECKER.— Although this bird breeds sporadically in Essex County and in general is considered a resident species wherever found, a tabulation of all the entries in the notebooks, covering twenty-six years, brings out very strongly the fact that on the coast in the vicinity of Amesbury, at all events, the Hairy Woodpecker appears very regularly during October and November in small

numbers, but only rarely in the winter and spring months. Thus out of the twenty years in which it is recorded, there are but two September entries; in eleven years it was noted in October and in five years not until November. During these two months there are sometimes as many as five or six records for each month. In four years there are from one to three December occurrences; one record each for January and February, two for early April, and one for May, all in different years. The last is of one seen May 30, 1890, a date that indicates perhaps a nesting bird. With us in central New England there is unquestionably a slight movement of these birds in late fall into woodlands from which they are absent in summer, but during the winter most of them seem to disappear again.

45. **Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.—The measurements of a bird taken November 24, 1883, are recorded in one of the notebooks. Another specimen is entered October 28, 1887, both no doubt from Amesbury. It is interesting that though both species of the Three-toed Woodpecker are found together in the White Mountains as residents, the Arctic is the more given to wandering, and is the one oftener noted in fall and winter outside of its summer range, while the American Three-toed Woodpecker much more rarely appears as a visitor south of its breeding range.

46. **Sphyrapicus varius varius.** YELLOW-BELLIED SAPSUCKER.—Although a July and an August record for Essex County are given by Dr. Townsend, he does not adduce any evidence of its breeding. Mr. Damsell's notes contain several mentions of this woodpecker in May and June, as follows: a male May 5, 1887; a bird shot at 'the farm' May 4, 1889; one shot at True's Pond, May 6, 1893; one June 12, 1891; one May 18 and 21, 1907. Perhaps an occasional pair nests in the swampy woods of this region. A late bird is noted on November 4, 1890.

47. **Phlœotomus pileatus abieticola.** NORTHERN PILEATED WOODPECKER.—So rare is this bird in the eastern part of Massachusetts that the only specific mention of its occurrence in Essex County relates to one at Manchester in December, 1885. Two additional instances are supplied by Mr. Damsell's notes, namely, a young male shot July 8, 1886; and a bird shot by one Moses Tewksbury at Kimball's Pond, October 4, 1895. Both these were mounted, and the measurements of the former are entered in one of the notebooks. Probably these were wanderers from central Massachusetts or New Hampshire.

48. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.—One was shot at East Salisbury, August 30, 1884.

49. **Antrostomus vociferus vociferus.** WHIP-POOR-WILL.—Mr. Damsell's notes extend slightly the extreme dates recorded for the presence of this bird in Essex County. In 1902 it was first noted April 28, and in 1891 a late bird is entered October 3.

50. **Chordeiles virginianus virginianus.** NIGHTHAWK.—On May 30, 1890, is the interesting note that Nighthawks were seen 'in flocks,' evidently late migrants bound still farther north.

51. *Chætura pelagica*. CHIMNEY SWIFT.— In 1898 Swifts remained unusually late and are entered almost daily till October 4.

52. *Empidonax trailli alnorum*. ALDER FLYCATCHER.— On June 8, 1890, a nest and four eggs were found near Amesbury; the bird is again recorded May 30, 1892, July 2, 1894, and May 25, 1901.

53. *Perisoreus canadensis canadensis*. CANADA JAY.— One was taken February 13, 1904, at Newton, New Hampshire, not far from the Massachusetts boundary.

54. *Sturnella magna magna*. MEADOWLARK.— The notes make but few records of the Meadowlark in January and February, namely February 10, 1894; January 15 and 25, 1902; February 23, 1910. Of late years it seems as if this bird was more regularly found in winter than before along the coastal marshes of the northeastern part of its range. Previous to 1905 Dr. Townsend had but a single January record for Essex County.

55. *Icterus spurius*. ORCHARD ORIOLE.— The breeding range of this bird extends in a narrow strip along the Essex County coast, and at Ipswich it has been found with some regularity. North of the Massachusetts line it has been rarely found as a straggler only. In Mr. Damsell's notes covering twenty-six years of observations at Amesbury it is entered three times, namely, July 4, 1883, one seen at Newburyport; May 12, 1891, and May 21, 1900, one noted at Amesbury.

56. *Icterus galbula*. BALTIMORE ORIOLE.— An interesting note records that on November 29, 1897, one was seen in Dover, N. H., 'with English Sparrows.'

57. *Quiscalus quiscula æneus*. BRONZED GRACKLE.— November 6, 1890, a 'large flock' was seen, a late date for such numbers. One was shot February 6, 1897, which may have been a wintering bird.

58. *Calcarius lapponicus lapponicus*. LAPLAND LONGSPUR.— Although prior to 1902 there were apparently no records of this bird in Massachusetts during winter, Mr. Damsell notes one shot January 10, 1885, probably on the seashore at Amesbury.

59. *Cardinalis cardinalis cardinalis*. CARDINAL.— On September 27, 1889, one was shot at True's Pond, Amesbury. It is interesting that Dr. Townsend records a pair at Amesbury on May 19, 1901.

60. *Piranga erythromelas*. SCARLET Tanager.— 'A male in full plumage,' August 26, 1897.

61. *Bombycilla cedrorum*. CEDAR WAXWING.— Usually the note-books do not record this species at Amesbury until May. There is commonly a well defined movement of Waxwings in southern or central New England during late January and February, when they appear with Robins, presumably from farther south. This early migration reaches southern New Hampshire, but apparently with considerable irregularity. At Amesbury, Mr. Damsell records two Cedar birds February 1, 1887, and a flock on February 19, the same year, but in other years this early flight is not mentioned. On September 10, 1889, old birds were seen still feeding their young.

62. **Vireo griseus griseus.** WHITE-EYED VIREO.—This vireo bred at least till lately in Essex County, but mainly in the more southern and eastern portions. Mr. Damsell records that on July 1, 1890, he shot one at Amesbury. Possibly a pair bred near there that year.

63. **Dendroica coronata.** MYRTLE WARBLER.—For how many years this bird has wintered to the north of Cape Ann, seems now beyond discovery. Mr. C. J. Maynard did not know of them in winter at Ipswich from 1868 to 1872, and the recent increase in the area of evergreen trees in that region may account for the numbers of wintering birds to be found there at the present day. At East Salisbury, Mr. Damsell shot one on January 23, 1884, and in several of the succeeding years he records it at Amesbury, namely, February 10, 1887, a flock of five or ten; December 17, 1887; December 28, 1891; December 30, 1893; February 10, 1894; January 1, 1901. These sporadic records do not seem to indicate that the Myrtle Warbler winters at Amesbury and vicinity with anything like the regularity that it does at such favored localities as Ipswich or at Cape Elizabeth, Maine.

64. **Dendroica fusca.** BLACKBURNIAN WARBLER.—A rather early date of arrival is May 5, 1886, when two males are recorded.

65. **Oporornis agilis.** CONNECTICUT WARBLER.—Mr. Damsell's notes make mention of a specimen shot September 27, and another September 28, 1893, while a third was killed October 2 of the same year.

66. **Oporornis philadelphia.** MOURNING WARBLER.—There are two instances in the notes when this rare warbler was seen at Amesbury — May 30, 1888, and May 30, 1892. I saw a bird at Ipswich on June 3, 1912. These seem to be the only definite dates published for Essex County.

67. **Icteria virens virens.** YELLOW-BREASTED CHAT.—One was shot at Amesbury on September 30, 1882 — of interest both on account of the late date and the locality. There is little probability that it had bred in the vicinity but may have wandered from the breeding stations in the southern part of the County.

68. **Anthus rubescens.** PIPIT.—The single spring note of this species in Mr. Damsell's books refers to one observed May 9, 1904. Dr. Townsend's spring records for the County are May 9, 1893, May 10, 1903, and June 8, 1878. The fall dates in the notebooks extend from September 10 (1887) to December 1 (1891.)

69. **Mimus polyglottos polyglottos.** MOCKINGBIRD.—Of late years, records for this bird in eastern New England have multiplied and should be gathered together to determine if this species is not becoming increasingly more common as a visitor and resident. That even a large part of the many recorded are escaped cage-birds seems unlikely. In Mr. Damsell's notes a Mockingbird is entered as seen at Amesbury, November 7, and again December 16, 1893, perhaps the same individual on both occasions.

70. **Regulus calendula calendula.** RUBY-CROWNED KINGLET.—A late bird was shot at Amesbury, November 26, 1885.

71. *Hylocichla guttata pallasi*. HERMIT THRUSH.—The Hermit Thrush breeds regularly along the coast of New Hampshire in the white pine woods, but in Essex County it becomes local and less common as a summer resident. Thus Dr. Townsend records its breeding at Lynn, North Beverly, between Gloucester and Magnolia, and in Essex, Georgetown, and Boxford. Judging from Mr. Damsell's notes it breeds with some regularity in the vicinity of Amesbury. Thus he found its nest and eggs on May 30, 1888, and again on June 1, 1894. In 1893 the bird is noted throughout May, and several times in June, July and August, 1898. A late bird was seen December 2, 1891.

72. *Sialia sialis sialis*. BLUEBIRD.—An early arrival was noted on February 16, 1902, and a male on the 27th of the same month.

CONTRIBUTIONS TO AVIAN PALEONTOLOGY.

BY R. W. SHUFELDT.

I. THE STATUS OF EXTINCT MELEAGRIDÆ.¹

Plate III.

UP to the present time, there have been but three species of fossil *Meleagridæ* described and recorded, and these are correctly listed — in so far as their names go — on page 388 of the third edition of the A. O. U. Check-List of North American Birds. Two of these, namely *M. antiqua* and *M. celer*, were described by Marsh,—the former being from the Oligocene (White River) of Oregon [?], and the latter from the Pleistocene of New Jersey.

It may be of interest, but surely of no importance, that Marsh also described other fossil remains of a bird as *M. altus* from the "Post-pliocene" of New Jersey, which has since been discovered to be but a synonym of *Meleagris superba* of Cope.

M. superba is the third species listed in the A. O. U. Check-List, and is said to have come from the Pleistocene of New Jersey. On

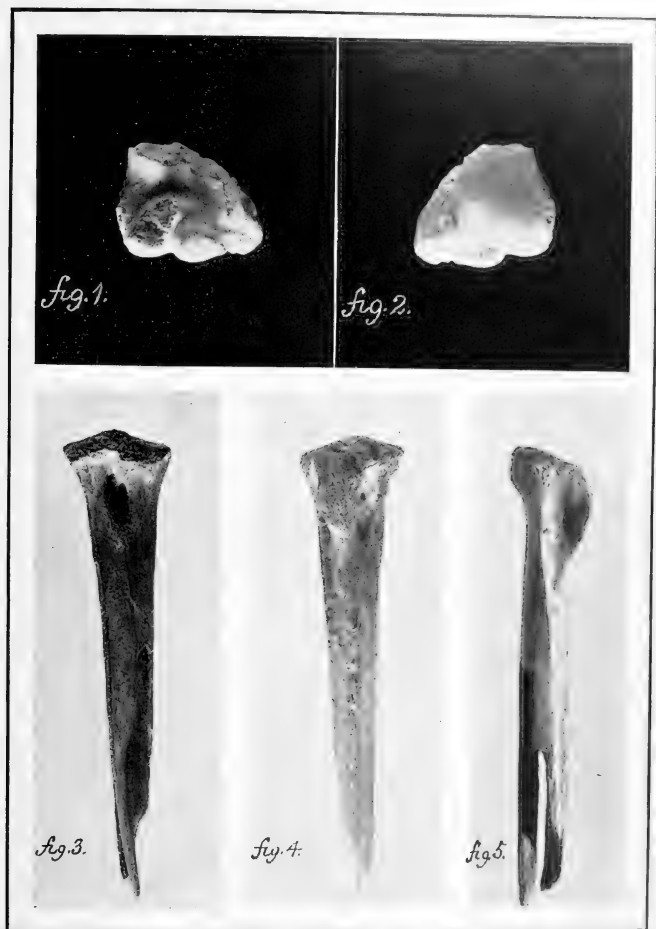
¹ *The Illustrated Outdoor World and Recreation of New York City* will soon publish in serial form a "History of the North American Turkeys" by E. A. McIlhenny, to appear as a book later on. The present article forms, in part, one of the chapters on Prehistoric Turkeys.

the 25th of April, 1912, Dr. George F. Eaton wrote me that the material, upon which *M. altus* is based, "is in the Peabody Museum (type) with other types of fossil *Meleagridæ*."

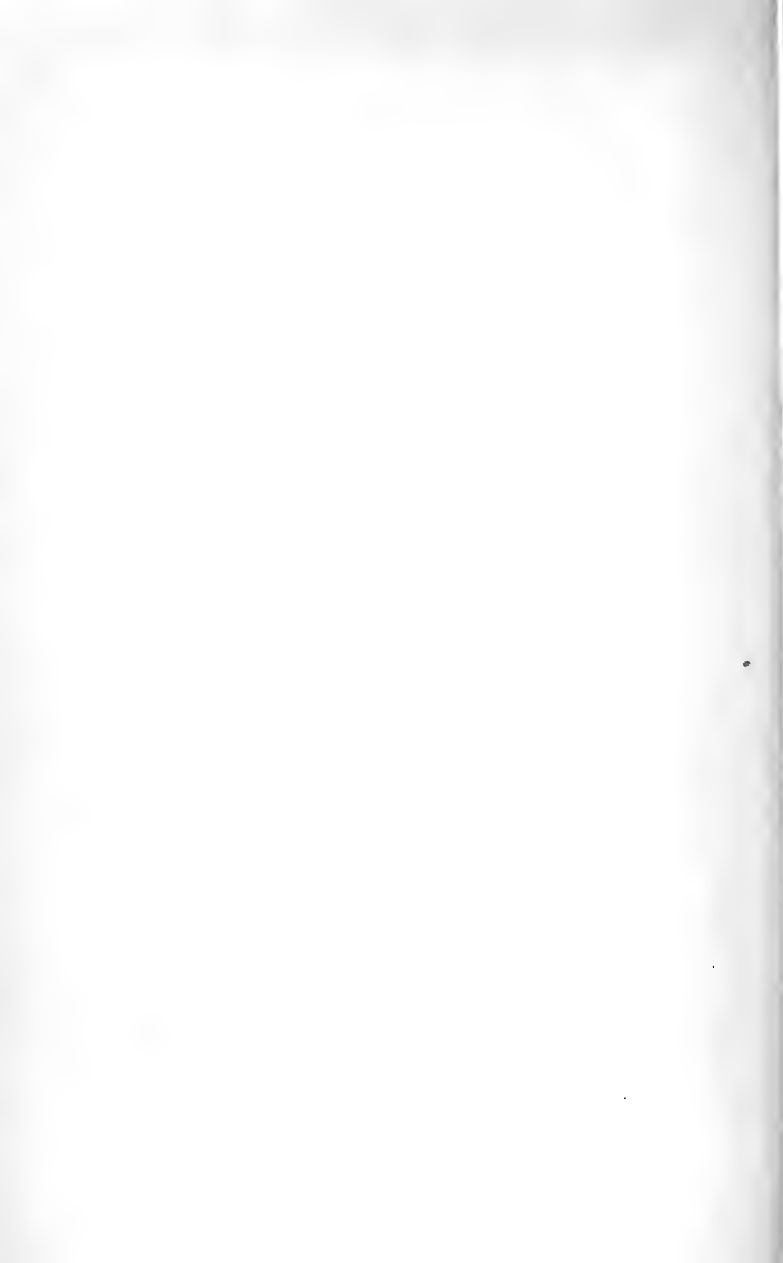
Cope's description of *M. superbus* occurs in the *Trans. Amer. Phil. Soc.* (N. S. xiv. Pt. 1, 1870, 239); it being a very careful and detailed piece of work, based on the material before him, which is said to have consisted of "a nearly perfect right tibia, an imperfect left one, a left femur with the condyles broken off, and a right coracoid bone, with the distal articular extremity imperfect." In my opinion, there would be ample here to establish a fossil species of bird, especially if placed in the hands of a good comparative avian osteologist. Personally, I have never seen the material upon which *M. superba* was established; but, judging from its character and its amount, I am strongly inclined to believe that Professor Cope had a fossil American Turkey before him,— at least the fossil remains of one.

Professor Marsh would never allow me to examine and compare the fossil bones which he described as those he suspected of belonging to extinct turkeys, and I never did so during his life-time. Several years after he had attempted to establish *M. altus* (now known to be only a synonym of *M. superba* Cope), I informed him that I was not prepared to accept his conclusions in the matter; and finally it came to pass that I published in a paper what I desired to set forth on the subject. This paper was entitled "On Fossil Bird-bones Obtained by Expeditions of the University of Pennsylvania from the Bone Caves of Tennessee" (*American Naturalist*, July, 1897, 645-650); and, in connection with other things said in it, I pointed out that among the bones found, many of them belonged to *M. g. sylvestris*.

Admitting the establishment of *Meleagris superba* of Cope, we have now to discuss the two other species. These are, as stated above, *Meleagris antiqua* (1871), and *Meleagris celer* (1872), both recorded by Professor O. C. Marsh. In my above cited paper on the Tennessee fossil bird-bones, p. 648, I have commented on the validity of these species as follows: "Professor Marsh at different times has described three species of alleged extinct Turkeys, viz., *Meleagris antiquus*, *M. altus* and *M. celer*; but I am very sceptical indeed in regard to the validity of the first-named,



FOSSIL MELEAGRIDAE.



i. e., *Meleagris antiquus*; or, in other words, I doubt the propriety of basing a new species of fossil turkey upon "the distal end of a right humerus," as Professor Marsh has done in this case. Nor do the characters he describes for this species, as being diagnostic, hold true. It is a positive detriment to science, in my estimation, to create new species of fossil birds upon the distal ends of long bones; and surely no assistance whatever to those who honestly endeavor to gain some idea of the avian species that really existed during prehistoric times. So far as *M. altus* and *M. celer* are concerned, I can only say that I know nothing of them from personal examination of the material upon which the species are based, and this has been refused me."

"In the case of *Meleagris altus*, Professor Marsh says that the length of the tarso-metatarsal is equal to 176.5 mm. (p. 261), and the present writer says that it is by no means uncommon to find the same bones in adult specimens of *M. gallopavo* fully of that length, if not longer. The other characters Professor Marsh enumerates, may each and all be due to sexual and individual variations."

"In the case of *Meleagris celer*, this likewise holds true; and in regard to the statement that the "remains preserved indicate a bird about half the bulk of *M. altus*," may be said with equal truth of *M. gallopavo*, in which species a similar discrepancy in size also exists between sexes and between the old and young."

"In other words, I am of the opinion, so far as I am able to judge from his descriptions, that when Professor Marsh described his three extinct and new species of *Meleagris*, he had nothing more or less before him than the very meagre and fragmentary remains of *M. gallopavo*."¹ As pointed out below, these birds may not have been true turkeys at all.

It is clear, from Professor Marsh's description, that he attempted to establish *Meleagris antiqua* upon an imperfect distal extremity of a right humerus, and *M. celer* upon the fossil bones enumerated below. It has already been pointed out in a previous paragraph that I found not a few fossil bones of *Meleagris g. silvestris* in the material which was taken from the Bone Caves of Tennessee,

¹ *The American Journal of Science*, ser. 3, ii, 1871, 126. (*Meleagris antiqua*.) The title is on page 120.

while no such bones occurred in the great mass of fossil bird bones from the Oregon desert.¹

Believing that things might have changed a little since the time Professor Marsh declined to allow me to examine the fragments of fossil bones upon which he had attempted to establish three extinct species of *Meleagris*,— a matter of some fifteen years ago,— I wrote a letter to Dr. George F. Eaton (April 19, 1912) of the Yale University Museum. This brought a reply next day, and in this he kindly stated that he would bring my request before Professor Charles Schuchert, curator of the Geological Department of the Peabody Museum of Natural History of Yale University. With great promptness and marked courtesy, Professor Schuchert (May 2, 1912) sent me, by registered mail, Marsh's *type specimens*, which he had used in his descriptions of *Meleagris antiqua* and *M. celer*. On the third of May, 1912, this material came safe to hand, and I immediately made a complete set of photographic negatives of the specimens.

I desire to express my thanks for the courtesies and privileges extended to me in this matter by Dr. Eaton, Professor Schuchert of Yale University; Drs. James E. Benedict and Charles W. Richmond of the U. S. National Museum, and Mr. Newton P. Scudder, Librarian of the same institution. Through their aid, I was enabled to examine and compare, with Marsh's fossils before me, a mounted skeleton of a wild turkey (*M. g. silvestris*), taken many years ago by Professor Spencer F. Baird at Carlisle, Pennsylvania, and to consult all the existing literature on the subject. Upon examining the material forwarded me by Professor Schuchert after it came into my hands, I found first, in a small tube closed with a cork, the distal end of the right humerus of some large bird. The cork was marked on the side "Type"; on top "*Mel. antiquus*. G. Ranch. Col. G. B. G. Aug. 6th, 1870." The specimen is pure white, thoroughly fossilized, and imperfect. The second of the two specimens

¹ Shufeldt, R. W. 'A Study of the Fossil Avifauna of the Equus Beds of the Oregon Desert.' Journ. Acad. Nat. Sci. Phila., ser. 2. IX. 1892, pp. 389-425, Pls. XV-XVII. Advance abstracts of this memoir were published in 'The Auk' (Vol. VIII, No. 4. Oct. 1891, pp. 365-368). The American Naturalist (Vol. XXV, No. 292, Apr. 1891, pp. 303-306, and *Ibid.*) No. 297, Sept. 1891, pp. 818-821) and elsewhere. Although no turkeys were discovered among these fossils, there were bones present of extinct grouse.

received is in a small pasteboard box, marked on top "*Birds. Meleagris, sp. nov. N. J. Meleagrops celer* (type)." The specimen is the imperfect, proximal moiety of the left tarso-metatarsus of a rather large bird. It is thoroughly fossilized, earth-brown in color, with the free borders of the proximal end considerably worn off. On its postero-external aspect, written in ink, are the words "*M. celer.*" On the cork of the vial containing the end of the humerus, the initials G. B. G. are, without doubt, those of Dr. George Bird Grinnell; and, as he there states that the specimen was collected at G. Ranch, Colorado, it is clear that the locality given (Oregon) in the last edition of the A. O. U. Check-List is incorrect. Besides, Marsh states in his article that the fossil is from Colorado; and this is further evidenced in the fact that the fragment is *pure white*, which is so characteristic of such fossils found in the White River region of Colorado.

My comparisons of Marsh's specimens of his alleged fossil turkeys with the corresponding bones of the skeleton in the case of *Meleagris gallopavo silvestris*, were most critical and thorough. Everything to make such comparisons complete were at my disposal for several hours, and no pains were spared to do the subject justice.

Marsh, in his article, evidently attached but little or no importance to the "other fragments" which were found with those upon which he based his descriptions; and from this fact it is fair to presume that they must, indeed, have been very fragmentary.

It has been unfortunate for science that Professor Marsh in his life-time was enabled to pay such scant attention to the osteology of existing birds; his weakness in this particular is evidenced in not a few places throughout his writings, as I have elsewhere pointed out.¹

¹ Marsh, O. C. *Odontornithes*. "The Struthious characters, seen in *Hesperornis*, should probably be regarded as evidence of real affinity, and in this case *Hesperornis* would be essentially a carnivorous, swimming Ostrich." (!)

Shufeldt, R. W. *On the Affinities of Hesperornis*. *Nature*, Vol. 43, No. 1104, London, December 25, 1890, p. 176. Review of Professor D'Arcy Thompson's paper, showing the true affinities of *Hesperornis* with the *Colymbidæ*, and not with the Ostriches. See also Shufeldt's "Comparative Osteological Notes on the Extinct Bird *Ichthyornis*" (*Jour. Anat. and Phys.*, Vol. XXVII., N. S., Vol. VII. Part III. Art. 2. Lond. Apr. 1893, pp. 336-342) where it is shown that Marsh entirely overlooked the relationships existing between *Ichthyornis* and *Rhynchops*, and for the reason that he was not familiar with the skeleton in the latter existing genus of birds.

In the case, then, of *Meleagris antiqua* of Marsh, I am of the opinion that we have not sufficient evidence before us to establish the fact that any such bird ever existed in prehistoric time; my reasons for so believing are the following:—

1. The existing material upon which the species is based is altogether too fragmentary to pronounce with anything like certainty that it ever belonged to a *Meleagris*.
2. The material is not only fragmentary, but very *imperfect* (see Plate III, Figs. 1 and 2).
3. The fragment does not present the "Characteristic portions" of that end of the humerus in a turkey as Professor Marsh states that it does. In any event, an imperfect distal fragment of the humerus of any big, gallinaceous bird is a very unsafe *bit* to establish a new species upon, and especially a supposed-to-be extinct one.
4. It is open to serious question whether the genus *Meleagris*, as the genus *Meleagris*, existed at all at the time the "Miocene clay deposits of Northern Colorado" were deposited.

In no way do I question that this fragment *may have* belonged to the skeleton of some long ago extinct galline fowl, about the size of an adult existing turkey; but that it was a true *Meleagris*, I very much doubt. It is just as likely to have belonged to many another kind of gallinaceous species, or even to some entirely different kind of bird in no special way related to the turkey.

Coming next to the material representing *Meleagris celer* of Marsh, as described above and here figured in my Plate (Figs. 3-5), a still greater uncertainty attaches to the supposition that it belonged to the skeleton of an extinct species of *Meleagris*.

As above pointed out, this is likewise an imperfect, much worn fragment of the proximal half of a tarso-metatarsus. I am not taking the tibiæ mentioned by Marsh into consideration, for of them he says himself that they only "probably belonged to the same individual" (see *antea*). There is no uncertainty about it at all.

Upon comparing this proximal moiety of a tarso-metatarsus of an alleged extinct species of turkey — *Meleagris celer* of Marsh — with the corresponding part of that bone in the skeleton of an adult

Meleagris g. silvestris, it is to be discovered at once that the comparable characters by no means agree.

In the existing species of turkey, there is but a single median groove marking the hypotarsus posteriorly. In Marsh's *M. celer*, the hypotarsus of this tarso-metatarsus is thus *twice* longitudinally grooved.

In *M. g. silvestris*, there is a pronounced ridge of bone extending some distance down the shaft, it being the continuation of the thickened, inner border of the hypotarsus. In the case of the fossil fragment here being considered, this ridge is only *indicated*, and, if it were ever present at all, it is here broken off and missing. It is a dangerous practice to describe parts and characters in fossil bones that are not present there.

Again, in the case of this fossil fragment, its general appearance or *facies* is quite unlike the corresponding part of the tarso-metatarsus in *M. g. silvestris*, or that of any other existing wild turkey. Indeed, off-hand I would say that it never came from the skeleton of any meleagrine fowl at all,—existing or extinct. And, as in the case of the alleged *M. antiqua*, it may have belonged to the skeleton of the tarsus of some other kind of a galline fowl — not a meleagrine one — while it is quite as likely to have belonged to the skeleton of some heron (*Ardea*) or other large wader as it did to a turkey.

For example, in some of the herons “the hypotarsus of the tarso-metatarsus is 3-crested, graduated in size, the outer being the smaller; the tendinal grooves pass between them.”¹

It has just been pointed out in the last paragraph that the hypotarsus of the tarso-metatarsus in Marsh's *Meleagris celer* is 3-crested, and the tendinal grooves pass between these crests, as in certain Herons. Mind you, I am not saying that Marsh had the bone of an extinct heron before him; but this is a significant fact, especially when we find, in the case of *M. g. silvestris*, the hypotarsus of the tarso-metatarsus is but 2-crested, having the median groove passing between them.

From fossil material to positively establish an extinct species of *Meleagris*, one should have at least a sufficient part of

¹ Shufeldt, R. W. Osteological Studies of the Subfamily Ardeinae. *Med. and Surg.* Vol. X, No. 4, Phila., Oct. 1899, pp. 287-317.

sternum, to pass with certainty on the missing portions; one or two of the long bones complete — or very nearly so — and, if possible, a few skulls and pelvic fragments. Lacking the last, a more or less complete coracoid and scapula are great aids in the matter of establishment. A complete *furcula* is of the utmost importance in a great many birds, and to this the gallinaceous ones are by no means exceptions. But, as in the case of *Meleagris antiqua* for example, Marsh had no such material before him; only the imperfect, fragmentary distal end of a humerus, that was all!

When Professor Cope was good enough to turn over to me several hundred fossil bones of birds for description,—had I made *new species* of all that I *might have done*, there would have loomed up in the list of fossil birds in the A. O. U. Check-List quite an extensive and varied fauna of extinct species and the higher groups; but I passed such fragmentary evidence by, and recommended that it be allowed to stand until some more material came from the same horizon and locality.

This is what should be done in the case of the *two imperfect, fragmentary bits* that Marsh had, and upon which he proposed to establish two extinct species of *Meleagris*.

PLATE III.

Fig. 1. Anconal aspect of the distal extremity of the right humerus of "*Meleagris antiquus*" of Marsh.

Fig. 2. Palmar aspect of the same specimen as shown in Fig. 1.

Fig. 3. Anterior aspect of the proximal moiety of a tarso-metatarsus of *Meleagris celer* of Marsh.

Fig. 4. Posterior aspect of the same fragment of bone shown in Fig. 3.

Fig. 5. Outer aspect of the same fragment of bone shown in figures 3 and 4. All figures natural size. Reproduced from photographs made *direct* from the specimens by Dr. R. W. Shufeldt.

II. STUDIES OF THE FOSSIL BIRDS OF THE OREGON DESERT.

Some twenty years or more ago, Professor E. D. Cope of Philadelphia placed in my charge for description a large collection of fossil vertebrates, that had been collected by himself and his assistants at Fossil and Silver Lakes in the Oregon Desert. To this collection were added numerous other fossils of a similar description,

which had been collected in the same region by Professor Thomas Condon of the University of Oregon, he being the first naturalist who discovered and collected any of the remains of fossil birds in that interesting locality. Professor Cope's chief assistant at the time was Mr. C. H. Sternberg, now known as one of the veteran fossil collectors of this country.

Ex-Governor Whitaker of Oregon was also an early collector of fossil birds at Fossil and Silver Lakes, and it was he who first discovered the remains of the now extinct swan, named by Cope *Olor paloregonus*.

This remarkable collection, as it came into my hands, consisted principally of the fossil bones of birds, as Cope had already described and published the mammals, fish and other forms.

To the birds, then, I gave especial attention, working the material up in great detail and with all possible care. Later on, the results of my labors were published as a quarto in the Journal of the Academy of Natural Sciences of Philadelphia,¹— a paper which presents what we knew of that region at the time the memoir appeared, together with very full descriptions of all the genera and species of birds I found in the material, of existing as well as extinct forms.

These have, long ago, passed into the literature of the subject, and are more or less known to palæontologists everywhere. Most of this work was done early in the year 1891, at a time when but comparatively few skeletons of existing birds were available, and consequently many of the fossil species remained over,— either not referred to the species they represented, or described as species now extinct.

Nevertheless, some very interesting forms were brought to light, and the character of the ancient avifauna more or less clearly defined. When the collection came into my possession, Professor Cope had already published an account of some of the fossils of birds he had found in it; for example, among the Grebes he was enabled to make out from the numerous fossils such species as *Aechmophorus occidentalis*, *Colymbus n. californicus*, and *Podilymbus podiceps*. He had also described an extinct Cormorant, *Phalacrocorax macropus*, and an extinct Swan and Goose, but had done little else with the collection.

¹ Vol. IX, Pls. XV–XVII, Phila., Oct. 1892.

As will be noted in my Philadelphia Academy memoir, to these I added a Pelican; nine Gulls and Terns, two of the former being new and now extinct; a Phalarope; two Coots, one of which was new and extinct; five Grouse, including a new and extinct genus and two new and extinct species; a large number of Ducks, Geese and Swans; a new and extinct Flamingo; also a Heron; two extinct Eagles; an Owl, and, finally, two new and extinct passerine birds. It is not my intention to refer to any of these here, beyond what has already been said,— the object of the present paper being to set forth the facts that during the summer of 1912 the entire aforesaid collection, with added material from the same localities, likewise a small collection from the U. S. National Museum — also from the Silver and Fossil Lakes region — again came before me for examination. The entire Cope collection now belongs to the American Museum of Natural History of New York City, and it was through the authorities of that institution that I was permitted to review these valuable fossils, and to prepare them for cataloguing. Upon undertaking this, by no means easy task, I found that the collection of bird skeletons at the U. S. National Museum, of existing species of American birds in particular, had been very much increased since the Cope collection first came before me. As a result, far more extensive comparisons could be made, and, naturally, new species and a number of previously unrecognized species came to light.

The enumeration of these will sufficiently account for publishing this brief advance abstract; while the reader, at the same time, is assured that the now completed memoir, covering the entire subject and presenting complete descriptions of all the new discoveries, will appear later under other auspices.

This abstract will list only such additional birds as I have been enabled to add to our lists of fossil forms through the above noted revision.

Among the *Pygopodes* I find two new species of Grebes, both now extinct, and neither apparently very abundant during Pleistocene time,— the first being a Grebe smaller than Holboell's but larger than our existing smaller Grebes; while the other was a Dabchick bigger than the present existing one in our fauna.

I find numerous bones of *Centrocerus urophasianus*; in no way

differing from the corresponding ones as they occur in the skeletons of the species of the present day.

Among the *Anseres*, I have to announce the discovery of *Mergus serrator* and other fossil bones, which appear to have belonged to specimens of *Mergus americanus*; also an undetermined form.

Among the Ducks, I find fossil bones — more or fewer of them — representing, for the first time, *Marila americana* (?) *M. valisineria*; *M. marila* (?); *M. affinis* (?); and *M. collaris* (?). Some of the material belongs to fossil examples of *Charitonetta albeola*, *Histrionicus histrionicus*, *Polysticta stelleri* and *Erismatura jamaicensis*. This last duck had already been found by Mr. L. H. Miller of San Francisco, and published by him in the Proceedings of the California Academy of Sciences.

Some of the bones point almost with certainty to the presence of *Branta c. hutchinsi*, *Branta c. minima*, and with absolute certainty to *Branta bernicla*.

Among the Swans, I find fossil remains of *Olor columbianus*, *Olor buccinator*, and a very large species of a new and now extinct Swan.

Further, I find fossil remains of *Botaurus lentiginosus* and *Ardea herodias*; and those of another heron I have to still consider. It is, however, a true *Ardea* and probably an extinct one.

Finally, I have to make the interesting announcement of having found fossil bones of two species of Eagles, both of which still occur in our existing avifauna; these are *Aquila chrysaetos* and *Haliaeetus leucocephalus*.

A STUDY OF THE HOUSE FINCH.

BY W. H. BERGTOLD, M. D.

THE characteristic native bird of the cities and towns of Colorado is the House Finch (*Carpodacus mexicanus frontalis*); notwithstanding its sweet and characteristic song, it is commonly mistaken by the average citizen and visitor for the English Sparrow.

Previous to the advent of the English Sparrow in Denver (about 1894, according to the writer's notes) the only bird at all common about the buildings of Denver was this finch. Before the present extensive settlement of Colorado, the House Finch was, so far as one can gather from the reports of the various early exploring expeditions, to be found mainly along the tree covered 'bottoms' of the larger streams, along the foot hills, to a small extent up the streams into the foot hills, and possibly along the streams as they neared the east line of the state.

For the past six years, the writer has systematically and particularly studied this species, bearing in mind several problems concerning it; the data secured in this work is now published for the first time.

It seems desirable to say here that the writer alone is responsible for each and every note, observation, and conclusion given in the following paragraphs, the same having been drawn entirely from his personal studies: everything herein following is published without prejudice to past observations and conclusions.

METHOD OF STUDY.

Under this caption are included the usual general observation of the bird whenever seen in and about the city, and special arrangements at the office and home of the writer, designed to facilitate minute observations, and to bring about a more intimate acquaintance with the bird.

The office is on the sixth floor of a building situated in the heart of the business district of Denver, and provided with suitable food and drinking trays on the window sill. At the house, besides

similar food and drinking dishes, there are special nesting facilities arranged for the birds. During the first year of this special study the nesting boxes were nailed to the house wall, and were very shallow. While such boxes gave the Finches ample opportunity for nesting, and were well patronized, it was soon seen that the shallow character allowed too easy access to the nest, a condition promptly utilized by the English Sparrow, to the great distress of the Finches, and the detriment of their nests, eggs, and young. It was also soon learned that boxes *fastened* to the house did not lend themselves to close and rapid inspection of nests, eggs, or young. Consequently, after the first trials, such nesting boxes as were under a small sharply pitched overhanging eave, were of flat cigar boxes, placed on shelves firmly fastened to the house, provision being made to prevent the box being blown from the shelf, and the whole structure so placed that there was only enough room above the nest-box to admit a small bird, and no more. By this arrangement the boxes could be lifted off the shelf from a near-by window, and taken into the house for a brief inspection. It also gave the Finches some advantage in fighting off the destructive English Sparrow in its persistent raids on their nests.

Those nesting boxes which were placed under a broad horizontal overhanging eave were made in two sections, a smaller inner nesting box telescoping from below into a large outer box, the latter being securely attached to the wall of the house. The inner box sliding upward into the outer box formed for it a false bottom, as it were, and was kept from dropping down by suitably arranged hooks. The top of the assembled box was partly closed over by a cover, an arrangement quite necessary in order that the Finches might put up a better fight against the English Sparrow when it entered from above. These first deep boxes were provided with small holes in the sides for ventilation, but this was later found not only unnecessary, but positively harmful, as it permitted late snow or cold rains to beat in on the eggs or young, causing considerable loss of both. These deeper nesting boxes were also of advantage in preventing the young from flying too early and by the time they were able to fly from the nest to the box top (about 6 inches), they had learned pretty well how to manage their wings, and were able to go, on the first flight from the nest, to nearby

trees or buildings with certainty and safety. During and after the summer of 1908, there were nine of these boxes attached to the house, all in pretty constant use by the Finches.

Drinking places or pans are strikingly necessary in Colorado's dry climate, and our birds visit any accessible water very frequently; hence artificial supplies of water have been peculiarly helpful in the present investigation.

The Finches soon learned that no harm was done to them when the nesting boxes were taken into the house for examination, and soon ceased to fret if a nest was temporarily absent from its usual place. Unless constantly frightened or really harmed, these birds have short memories for minor disturbances. This is well illustrated by one occasion, when a persistent fluttering in a box, located near the writer's sleeping porch, called attention to a nesting female Finch caught and entangled in some string which it had used to construct the nest, the string having become firmly entangled about the bird's foot. The bird would have perished had it not been freed, but in less than fifteen minutes after it was again building as busily as before, notwithstanding the handling incidental to its liberation. This occurrence also shows how well the House Finch lends itself to study. It is not essential for ordinary study that the boxes be taken down daily and brought into the house, as much can be accomplished by inspection with a hand mirror held above the nest.

ABUNDANCE.

In 1881 when the writer first visited Colorado, Denver was a small city of about 30,000 inhabitants, spread over a rather limited area, and built of houses and blocks of very modest dimensions. The House Finch had, however, already taken advantage of the opportunities afforded by the nooks in, and sheltered projections of, houses, barns, and other buildings, to construct nests thereon. The bird was then only fairly numerous, yet its engaging song indelibly impressed itself upon the writer's memory. In the interval since 1881, the multiplication of these birds in Denver has been enormous and it seems reasonable to assume that this increase has

been due largely, if not entirely, to the enlarged facilities for nesting brought about by the presence of buildings erected, and trees and vines introduced, through civilization; and to a larger food supply afforded the birds, resulting from the great increase of seed bearing weeds which has followed the plowing of the virgin prairies on which the city grew. Furthermore the waste food products of this city form a large source of food for these birds, and have added to the other factors leading to the increased abundance of this species. It would appear from this that we have here another example of man's unconscious aid in the multiplication of an indigenous bird population and fortunately for Denver, this species has probably been largely, if not wholly, beneficial, thus making for the community's good.

The House Finch is resident in Denver, though some facts relating to its seasonal incidence lend color to the idea that it may be locally migratory. During August and September of each year there is a noticeable diminution of Finches about the city. This is the time when the burdens of nesting and raising of young are practically over, permitting young and old to flock on the prairies to feed on weed seeds:—numerous records of flocks seen in the suburbs about this time, and later, would confirm the above idea.

It is exceedingly difficult to determine if the same individuals remain in one's neighborhood throughout the entire year. During the summer of 1908 an effort was made to throw light on this question. Sixteen young birds, all raised in the writer's nesting boxes, were tagged with a light brass band, the same having been placed about the right tarsus of each bird before it left the nest. With the exception of one, which was found crushed in the alley the day after it flew from the nest, none of these 16 birds was ever again identified about the premises. This might be taken as meaning that the young did not remain permanently about the nest neighborhood, but it may be that such tagged birds did remain in the neighborhood, but were undetected.

In the summer of 1909, several young birds were tagged with brass bands on the left tarsus, and in 1910 some with brass bands on both tarsi, with the hope that such marking would aid in determining how old a Finch might grow to be if left to nature, and all the vicissitudes of bird life. This tagging has shown definitely

that some, at least, of the Finches remain in one's immediate vicinity the entire year; *e. g.*, ♂, marked October 2, 1909, was seen all the following winter, and again in the succeeding spring, and another, ♂, marked by bands on both tarsi, has been noted about the office building for more than two years.

WINTERING.

Winter in Denver seems to have no terrors for this species. It appears to the writer that the cold season does not trouble the House Finch much so long as the bird is well fed, though many, doubtless, suffer frosting of feet during extremely cold spells, resulting in mutilations referred to later on. The birds roost at night, whenever possible, close to buildings, in vines next to a wall, in a nook or on a moulding under an overhanging eave, and in the folds of awnings, for which places the birds have many fights until all are located for the winter, each going to its accustomed place a considerable time before sunset. The young birds sleep in trees after leaving the nest. They have never been observed to sleep two or more together, but appear, on the contrary, to desire separate places, each by itself. It has seemed odd to find that the birds never use the nesting boxes to sleep in, after the nesting season is over. In December they go to roost early, 4.15 p. m. and sleep with the head under the wing, puffed up like little feather balls.

CENSUS.

Can one form any definite idea as to how many House Finches there are in Denver? This question imposed itself on the writer early in this study, because of the relation of this species to the English Sparrow, and while it is self-evident that any estimate along these lines must be approximate only, it is however, not without interest to try to answer it.

There are in the city of Denver 3500 blocks whereon are to be found buildings of one kind or another. If two Finches are allowed for each block there would appear to be 7000 Finches in the city, a number seemingly reasonable as a minimum estimate. At one

time during the summer of 1908, at least fourteen pairs of Finches were known to be nesting in the block in which the writer lived; thus there were twenty-eight Finches living in this block at that time. It is possible that the unusual nesting facilities at the writer's house may have increased the Finches in the block beyond normal numbers, yet a careful survey of many blocks in other parts of the city justified the writer in feeling that the number of Finches in his block was what one might call "average common." This would give us another estimate, counting only the built up blocks, to wit, 98,000 for the entire city. The writer has actually counted in April more than one hundred Finches congregated on the telephone wires leading to one building, near his office, a structure ornamented with many ledges, lintels, arches, etc., and lending itself well for night lodging places for the House Finch. This date is well on in the early incubation period of the year, and one feels justified in assuming that these birds were not young of the year, or old birds gathered together from a wide area to roost only, but were most likely males going to rest near their nesting locations. This is, furthermore, made more probable by the fact that all of these birds seemed in full spring song, characteristic, practically, of the male only. There could not have been less than 200 birds about this building at the time mentioned, and there were almost as many more on the building on the opposite side of the street, showing that these birds are extraordinarily abundant about the business parts of the city, an abundance which can well compensate for any possible scarcity in the outskirts, though it is readily evident that in the outskirts too, the Finches are quite numerous. If we estimate 200 Finches to each 'built on' block, we would have a Finch population of 700,000, a number to be considered as a maximum, and probably a considerable overestimate, though the writer is by no means convinced that it is actually an overestimate. Averaging the Finch population in another way, one can say that there are four Finches for each of the 35,000 houses (or other buildings) in Denver, resulting in a total of 140,000 House Finches in the city.

No portion of the territory within the corporation limits is without its Finches, and after studying the question with care for years, and considering every way of making an estimate, the writer feels

that it is very reasonable to assume that there are ten House Finches to each platted block within the city, which would give a total of 130,000 Finches, there being 13,000 platted blocks in the city, 3500 of which are built on; this estimate of 130,000 House Finches for the city of Denver is probably far below the actual number.

SONG.

Both sexes sing, though the female's attempts are modest and rather infrequent. That the females sing is indisputable since nesting females have been noticed singing, an observation which precludes mistaking an immature male's singing, for a female's attempt at song. The female's is, however, a weak imitation of the male's vigorous and sweet song, which is best and richest, as with other song birds, during the breeding season, yet there is no month of the year when this song is not heard. During the cold months the birds are comparatively silent but they frequently burst into song on bright sunny winter days, which, with us in Colorado, are very common. The association between these clear bright mild winter days and the singing of the Finches is too obvious to be overlooked. The song is poured forth in volumes while the bird is on the wing, and also when at rest, and reminds one in parts, of that of the Pine Finch. From the middle of January onward, the singing increases with the lengthening days, hushed now and again by extreme cold, and this generous song makes the bird a delight and a joy, one to be harbored and protected.

By attracting the birds to one's windows, one comes so closely in touch with them that opportunities for detailed study are unsurpassed, while the bird's abundance and fearlessness give one the most intimate acquaintance possible. Furthermore, the varied calls and notes of both sexes are of exceeding interest, heard to great advantage in this way through their propinquity. There is a distinct and recognizable difference in the alarm note over the sight of a dog or a cat if it be near the drinking place, and the alarm when one examines the nest. The writer has learned to know when the young are ready to leave the nest by the peculiar coaxing notes of the old birds. During nest building, the male often feeds his busy

mate, as he would a young bird, and at such times the notes uttered by the female are peculiar to this part of the nesting habits. During August and September the song is at ebb, but starts afresh, on a subdued scale, in October.

The young of the year have frequently been heard trying to sing in late summer, a song small in volume but with unmistakable characteristics.

Food.

The House Finch will eat almost anything vegetable, though it prefers seeds, and experiments with different seeds show that hemp is selected to the exclusion of all others. Nevertheless it feeds in our streets and alleys, gathering bread crumbs, eating from pieces of bread, apples, oranges, and, in fact, from almost any piece of table refuse. It will consume large quantities of fat, more especially suet. In winter when the ground is unusually deeply covered by snow, these birds wander far and wide over the prairie and vacant city lots, eating weed seeds, particularly those of the so-called Russian Thistle (*Salsola tragus*). It was, to the writer, a most satisfying discovery to find that the nestlings were, whenever possible, fed as soon as hatched and thereafter, on dandelion seeds. Each succeeding year has confirmed this observation and young birds not more than two hours out of the egg have been noted with crops stuffed to repletion with dandelion seeds. At this period of the bird's growth the neck-skin and the crop covering are almost wholly transparent, so much so that one can readily distinguish the dandelion seeds within. The old birds are to be seen at this time busily gathering these seeds for the nestlings, selecting those dandelion blossoms which have matured but are not yet open enough to permit of the seeds being dispersed by the wind. Such blossoms are deftly dissected by the old birds, and each seed taken from the blossom, the pappus being nipped off close to the seed. To insure certainty to the correctness of this observation, the writer has examined the crops of several nestlings killed by English Sparrows, and has been able to say definitely that the crop content, in these instances, was formed wholly of dandelion seed.

If not fed on dandelion seeds, the nestlings are given such food

as the old ones usually consume but the writer has never detected any animal food in the crops or stomachs of House Finch nestlings. This Finch has never been seen feeding from the horse manure of the streets.

The House Finch exhibits, in common with many other birds, a fondness for maple sap, sipping it as it oozes from the cut branches of a spring pruned tree. The only objection my friends hereabout have against the House Finch is that it eats in the spring, leaf and blossom buds from bushes and trees — for example, lilac bushes and apple trees.

VARIATION.

The tameness of the bird and one's proximity to it lent by this method of study make it possible to note and realize the great and marked variation to be found amongst the House Finches: one can learn, not only to recognize different individuals by some peculiar differences in color or marking, but can also notice and recognize shades and extent of color that have been spoken of, and described as forming various races of this species.

This impresses one as though there were spread out before him a large series of skins to study; one feels much as a closet naturalist must feel when he takes in hand such a series and has the satisfaction of elaborating a new geographical subspecies. The extremes in color of feather, bill, tarsus and foot, and the presence or absence of tail emargination become so patent through one's study of the bird in this way that, though these are here seen in birds known to be all of the same subspecies, one is almost persuaded to believe the birds are specifically different. One is impressed, too, by the differences in color, pattern and marking in birds coming from the same brood. Mature males have been seen with *bright yellow throats* and *rumps*, and every shade in the mandibles has been seen, varying from coal black to a gray so light as to be easily mistaken for white.

The more one studies this interesting bird, noticing its extreme variability, the more one muses over the validity of species, realizing more clearly than ever before that species exist for man only; or, if one wishes, one can feel that one is in the presence of the making of species.

In the course of these observations, several birds have been

noticed showing distinct melanistic phases, one female being almost black above, and not from city soiling, as the bird was still black after bathing: as mentioned below, an albino female has been seen during two succeeding seasons, having returned a second time to successfully build a nest in the locality where first observed. A female with a long decurved upper mandible has been watched through several months. This mandible was shaped very much like that of a Cross-bill and was probably not deformed through injury as it closed perfectly in apposition to its fellow of the under side, and was perfectly functional. It may well have been an example of mutation.

Many characteristics, other than physical, of each individual come to light as one watches the birds at close range. Many females are quite tame from the onset, and become steadily more so, allowing one to examine them with a mirror overhead as they are setting, showing no alarm, and even some degree of curiosity. The quarrelsomeness of some, and the gentleness of others are especially patent. The water dishes are as often desired for bathing as for drinking, causing as many disputes over the bath privilege as the birds have over food in the feeding trays. Some are so tame that they come through the open windows into the office during severely cold weather, and perch on the steam radiator which is next to the window sill.

MATING.

The writer suspects that this species mates permanently: it is apt, in all seasons of the year, to come to the food and drinking dishes in pairs. After one becomes well acquainted with this species, one learns that a series of indescribable notes and chirrups betokens a mated pair, and these notes have been heard many times outside the usual mating season, *i. e.*, in the late fall and winter. It is a common thing to see a pair examining nesting boxes, and other eligible nesting sites, in December and January. In the winter of 1906-1907, a pure albino female Finch was observed on the writer's home premises, accompanied by a normal male, which paid particular attention to the albino, being, without doubt in the writer's judgment, the latter's mate, notwithstanding the distance of the ordinary season for pairing and nesting.

NESTS AND NESTING.

The House Finch nests in vines about houses, in sheltered corners and awnings of buildings, in baskets hung on houses, and, in fact, in any place of vantage about a building. It also, though rarely, builds in trees, as high in one instance as twenty feet above the ground; in bushes; and in years past (1894) when the electric arc street lights were covered by a conical metal hood, a number of nests were seen on the cross piece under the hood. Nests have been observed in globes, when partly broken, surrounding incandescent lamps hanging under verandas and *portes-cochères*. These nests were frequently found in very noisy and conspicuous places, *i.e.*, the busy entrance to a large hospital. A pair had a nest, during the past spring, in one of two old-fashioned square lantern-shaped entrance lamps on the University Club, in each of which were two incandescent lamps burning brightly until past midnight. The incubating female was not disturbed in the least by this light, nor by the numerous visitors to the club going by her nest.

The writer has only once noticed the species use an old nest of some other species for nesting purposes, in which case a pair of House Finches relined an old Robin's nest and used it to raise a brood. It will thus be seen that there is a considerable degree of flexibility in the House Finch's nidification traits, a flexibility which probably has helped very largely toward the bird's great increase in Denver.

The writer is fully convinced that nesting bears a large relation to the weather conditions, being controlled largely, perhaps entirely, by the temperatures prevailing over a more or less extended time. Very frequently in Denver, October and November are remarkably mild, and during such mild spells young Finches, in pairs, have been observed inspecting the bird boxes on the house, and on a few occasions in October and November a pair of young of the year have been seen making abortive attempts at nest building. This suggestion — the effect of warm weather on the nesting instinct, is made more probable by the actions of the birds during warm spells in mid-winter, when the males begin to sing vigorously, the song

exhibiting many easily recognizable nuptial characters — all these indications of the awakening of the nesting instinct are at once silenced if cold weather supervene. Cold weather has a positive deterrent effect on egg laying, a fact clearly established by the writer's records. On the other hand pairs of House Finches, unquestionably mated, have been observed looking for eligible nesting sites in every month of the year, not excepting the period from September to February. The earliest active nest building noted by the writer was on January 30, and the latest July 23; while pairs have been noticed gathering material as late as December 22, these attempts have been classed, however, by the writer as due to a fleeting spell of warm weather.

The birds grow very tame if the nest be closely associated with man and his doings: they seem to be bothered in no way by slamming of doors or by passers in and out of a door close to a nest. The nest is a shallow cup-shaped affair, roughly about four to five inches in diameter, which varies, however, according to the space in which it is built, and has a depth within its cupping of from two to two and a half inches. If built in a box it never completely fills the whole of the floor space unless the box be very small otherwise the nest will be of the usual diameter, and placed, in the majority of cases, in the end of the box farthest away from the light. The materials used in nest building vary according to location: one found in the business district was made entirely of dried freshly cut grass, evidently gathered from the lawns surrounding the municipal buildings, and had a lining of cotton batting. Another nest from the business district was made of rootlets, cow hair, and also lined with cotton batting.

Nests found in the outskirts of the city have the outer portion made of straw, hair, string, small twigs, weed branches, grass and rootlets, and have as a lining some good non-conductor of heat, *i. e.*, cotton wool or string. One nest was built over a large mass of wool which seemed to have attracted some variety of fly, which later had deposited its eggs in the wool, producing maggots that did not bother, so far as one could determine, the young finches growing above them.

One can expedite and encourage the nest building by putting fine straw or dry grass in the nesting box, arranging the material

roughly in the shape of a nest just begun. The first nests of the year are usually built very slowly, three to six days being consumed in the work, which is done wholly by the female, though the male often brings pieces of nest material, which are, however, never accepted by his mate. This performance of the male always impresses one as being a 'bluff.' He dances constant attendance on the female as she works, cheering her continually with vigorous song, at its best at this time. Later in the season a nest, if it be what one may term 'an emergency nest,' may be completed in a single day, and an egg laid in it on the second day.

After a nest is finished, if it be not an 'emergency nest,' the builders almost invariably leave the neighborhood and are not seen again for a few days, at the end of which absence they reappear, and egg laying begins. If the birds be undisturbed, and the old nest left *in situ*, it may be used to rear a second brood, without its being renovated in the least; but this use of an old nest is not usual. More often an old nest, if used for a second time, is partly covered by a new one, to avoid, it may be, insects, or the soiled condition of the old one. In only one instance has the writer seen the same nest used for three successive broods. On several occasions a new nest has been built over an old one, in which there were abandoned eggs: whether or not the builders of the first and second nests were the same birds, the writer is unable to say. Vigorous nest building begins early in March, unless the weather is too severe. The earliest date on which a completed nest, with an egg in it, has been noted was March 12, though there were many nearly completed nests in the same neighborhood on the same date, or earlier. By the last of March, nesting is in full swing all over the city, but the flood tide of nidification is in April and May (taking the egg laying as an index), there being little difference between these two months, as the following table will show, the data being from the nests about the writer's home premises:—

TABLE NO. 1.

Number of nests completed and containing at least one egg.

	1906	1907	1908	1909	1910	Total
March	—	2	2	2	2	8
April	—	4	9	0	5	18
May	2	5	6	4	2	19
June	3	3	3	2	2	13
July	2	1	2	3	0	8
Unrecorded	1	1	0	0	0	2
Total	8	16	22	11	11	68

The materials used in nest building are not always gathered in the neighborhood of the nest, for the females often go considerable distances for nesting stuff, though suitable material could be gathered closer at hand.

The chances are that a pair uses an old nest more than once, though this is not easy to determine, simple as it might seem. One pair, the female of which had a white feather in its tail, selected a new site for their second, and also for their third brood, which establishes, in any event, that this easily identified pair did *not* use the old nests for new broods.

On several occasions, when English Sparrows have so harried a pair of Finches as to stop incubation before the writer could dispose of the invaders, the same Finches, presumably, have built a second nest over the first one and its eggs; that, however, the builders of the first and second nests were identical, the writer has never been able to determine beyond doubt. Four attempts, extending over a period of sixteen weeks, at nest building in the same box were observed by the writer in 1908, the birds seemingly being identical in all four attempts, but not identified with certainty. One and the same pair, identified positively, has been detected building in one box for a while, only to stop and begin anew in another; probably due to interference by English Sparrows.

EGGS.

The average number of eggs in a set estimated on sixty-six sets, having a total of two hundred and eighty-one eggs, is four plus, the largest being seven, and the smallest two, the latter however may not have been a completed set, though it went on to full incubation. In emergency sets, *i. e.*, complements of eggs laid after a previous set had been destroyed by English Sparrows or storms, smaller numbers prevail.

The average weight of a first egg was found to be 36 grains (13 weights averaged), the extremes of weights being 32 grains and 40 grains. Some sets are extremely variable in the weight of the eggs therein, one set of four eggs giving weights of 32, 33, 35 and 35 grains, while another complement of eggs weighed 35, 35, 35, 35 and 36 grains respectively. The average length was .77 inch, and the diameter .54 inch, the extremes in length being .81 inch for the maximum and .68 inch for the minimum, while the extremes in diameter were .57 and .51 inch respectively.

The earliest date on which an egg has been detected in a nest was March 12, and the latest (counting the date on which the egg was laid) was July 27.

After a female begins to lay, one egg is laid each day until a set is completed. It is quite rare that the daily eruption of an egg is disturbed or intermitted; in 68 sets recorded during five years there have been but two in which this orderly succession of an egg a day has not obtained, and it is quite possible that on one of these occasions the interruption was due to the sudden onset of extremely cold weather. So far as the writer has been able to determine, the eggs are always laid at night, *i. e.*, between the hours of 7 P. M. and 7 A. M., many nests having been examined repeatedly at short intervals during the day with special reference to this particular point.

With the larger sets (five or more), one often finds an egg outside the nest, presumably accidentally crowded out, because of lack of room. Several times infertile or undeveloped eggs have been found in the box outside the nest, the other eggs of the set having gone to successful incubation. Whether the old or young birds have accidentally pushed out such eggs, as they move about in the nest

is not determinable. The writer suspects that the old birds may remove from the nest, eggs which have failed to hatch, because such eggs have frequently disappeared when the nest has in no way been disturbed by English Sparrows, which would be the only other cause in explanation of this disappearance.

The female has a peculiar and unmistakable cry when laying, a call which is answered promptly by her mate. The writer has frequently been led to discover new sets of eggs in a nest through hearing this peculiar 'egg cry' of the laying female. The female also calls to her mate in a different, yet characteristic, way when incubating. She is then often fed by the male, the feeding being precisely similar to the feeding of a young bird, even to the fluttering of wings, etc.

The average length of incubation is fourteen days: occasionally it may be a few hours or even a day shorter, but more frequently it is longer. In one set the first egg laid apparently took fifteen days to hatch, and the fourth egg seventeen days, the other two eggs of this set being failures, one from infertility, and one dried after being partly developed.

It is somewhat difficult, in studying the incubation period, to estimate the amount of incubation effected by the laying female. In some sets the first egg laid can be seen to be partly incubated before the whole set is completed, taking the newly formed red blood channels which show clearly through the shell in the developing ovum as an index of incubation. This may, and probably does, explain the irregularity which has frequently been noticed in the hatching of a set of eggs; almost every possible combination of hatching having been noted — all on the same day, though this is not common; two on one day and the remainder at regular intervals etc., etc. The female, while incubating, has been seen during daylight asleep on the nest. The eggs sometimes undergo a surprising amount of cooling without being spoiled. One set, when partly incubated, was successfully hatched after being uncovered all of a cold rainy night, the female having been frightened from the nest at about 11 P. M., not returning until daylight. Several sets have been hatched despite the occurrence of several snow storms during incubation. An attempt was made, several times, to mark and number each egg as laid, in the end to determine

which egg was hatched first, but each effort, except one, was a failure because the pencil marks became blurred or effaced by the rolling of the eggs in the nest as the setting female moved about.

This method of investigation, by marking the eggs, has not been pushed as far as might have been possible, because of the fear of breaking the eggs, which accident happened once in the early attempts at marking. The writer has also been unable to determine whether the largest or the smallest egg hatched first, or whether the size of the egg bore any relation to the length of incubation. In the single exception mentioned above, the egg laid first, hatched first. It is possible that the eggs, as laid, could be colored by aniline dyes, and thus be distinguishable one from the other; but this method was not used through the fear that the dyes might be detrimental to the development of the eggs. Only once, during five years of systematic observation on 68 nests, have empty egg shells been found in a nest, an observation which may reasonably be held to show that the old birds remove the empty egg shells, as they do the fecal sacs during the first days after the eggs are hatched. Two broods are probably raised each summer, and, on one occasion at least, three were raised by the same female.

The record of this particular female is interesting: the first egg of brood No. 1 was laid May 14, of brood No. 2, June 23, and of brood No. 3, July 9. In brood No. 1 there were five eggs, in brood No. 2, four eggs, and in brood No. 3, three eggs, this diminuendo scale meaning, perhaps, a gradual slowing of the ovarian energy for that year. Of these twelve eggs, one was infertile, seven were hatched successfully, and the nestlings left the nest in due season; and though the four of the second set were hatched successfully, English Sparrows raided the nest, and killed all the nestlings when they were two days old. It is highly probable that this female was stimulated to raise a third brood by the early loss of the second one.

INFERTILE EGGS.

The number of infertile eggs out of a grand total of 283, was 25, a percentage of infertility of about 9. It is rather difficult to establish a certain index of infertility, and, to be safe, the writer considered as infertile only such as could not have been chilled, or such

as failed to hatch when others in the same nest were successfully incubated. All eggs which failed to hatch were examined to determine if any development had occurred, and when any least trace was found, such egg was not counted as infertile. The infertility varied considerably from year to year as the following table will show:

TABLE No. 2.

	1906	1907	1908	1909	1910	Total
Sterile eggs	1	8	3	9	4	25
Total laid	33	64	87	52	47	283

The male feeds the young for a considerable period after they leave the nest, often so long that he will also be feeding at the same time the young of a second brood. The female is most devoted to her nest, leaving it with extreme reluctance, and returning as soon as an alarming disturbance ceases. The nest is kept under close surveillance, and a female may even show signs of anxiety if an empty nest (after the young have flown) be examined. The incubating bird will stay on a nest under very distressing conditions, *i. e.*, during a severe snow storm; and on one occasion a female was noticed brooding a nest full of young which had frozen during the previous night.

FEATHERS.

The feather development and growth occur with amazing rapidity, even twenty-four hours making surprising changes, especially during the first few days after hatching. The appearance and growth of the various feather tracts differ, apparently, in different broods and individuals. It is approximately as follows:—the young up to the fourth day seem naked, but are really partly covered by a minute down which appears in streaks, there being four lines on the head, *i. e.*, one along the skull in the long axis of the body, one over each eye, and one over the occiput, transverse to the long

axis of the head. There is also one along the dorsum of each wing, one over each scapula parallel with the vertebral column, an interacetabular dorsal patch, a streak down the outside of each thigh, and a sternal streak which bifurcates, one fork going under each wing, and on the second day an interscapular vertebral streak appears. All these areas grow rapidly and soon appear to coalesce; and by the fourth day the body seems to be covered all over with down, except the belly, and, by this time, the wing quills are just budding. On the fifth day, the wing quills are one eighth of an inch long, while the back and side streaks of down show a stubby growth of feather tubes. The wing quills, on the sixth day, are three-eighths of an inch long, the tail feathers are one quarter of an inch long, and the back and neck stubs are now clearly distinguishable as feathers. On the seventh day, the wing feathers are five eighths of an inch long, but are not wholly delivered from their casings, and the shoulder stripes show as true feathers. On this day, the wing, tail and back feathers are long enough to be preened by the young bird. On the ninth day, the back is entirely covered by true feathers; and on the twelfth day, the whole bird appears feathered as an adult, with, however, this difference, that a good deal of the original down persists, and stands out beyond the true feathers, most noticeably on the head. It was of especial interest to the writer, while taking notes on the feathers of this bird, to see how slowly and how late the head became covered, a condition which may perhaps be taken as a tendency to persistence of the primitive avian pterylosis, in which the head was long naked. (Scott — *Introduction to Geology*, p. 698.)

NESTLINGS.

The young remain about fourteen days in the nest, which is kept perfectly clean by the old birds for four or five days after the eggs are hatched.

When the young birds have developed enough to voluntarily move about, and arrange themselves in the nest, which usually is about the fifth day after hatching, the nest edge then exhibits the first signs of fecal soiling, which comes about in a manner common

to many other nestlings, that is to say, the young birds void backward over the nest edge, after each feeding, leaving the nest centre unsoiled. The young are fed by the parent bird during the whole of nest life by regurgitation. If the season be that of dandelion seeding, which in Denver is a continuous performance from April to November, the crops of the nestlings are seen to be full of dandelion seeds. When the nestlings are very young (one to three days old) the regurgitation act of the parent is very prolonged; indeed it is very much longer at this time than when the young are more fully developed. Both old birds share the work of feeding the young, and the intervals between the feeding are comparatively long, much longer than with nestlings fed on animal food, as a Robin, for example.

An interval of fifteen or twenty-five minutes between feeding visits by the old birds to the nest is not at all unusual. This may be due to the obvious fact that it takes longer to gather a crop full of seeds than it does to get a bill full of worms. The old bird invariably goes to the drinking dish for water, immediately after feeding the young. Different pairs vary very much in their attentions to the young and it is noticeable that the old birds are less assiduous in feeding the young toward the time when they ought to leave the nest, a neglect which may tend to *make* the nestling venturesome and leave the nest. The newly hatched birds make no noise, and not until about the third day can one detect any sound coming from them; and then it is but a faint peeping, which, however, rapidly increases in vigor and strength, so that on the seventh day in the nest, the young birds make considerable noise when the old birds visit them. If a bird only twenty-four hours old be placed outside the nest, it will crawl about using its wings as a pair of anterior legs and a nestling three days old will, if placed on the nest edge, crawl back into the nest, and arrange itself according to a fixed way, rump in, and bill extending toward or on the edge of the nest. The young preen themselves quite early during nest life, as they have been seen arranging and cleaning their feathers when seven days old. During the first three days after being hatched, the young *seem* to have closed eyelids, but a close and careful scrutiny reveals a narrow slit through which the birds probably notice their surroundings.

Not infrequently a very small nestling (*i. e.* 24 hours old) has been found uninjured outside the nest proper, it is possible that the old bird in trying to remove egg shells may have pulled the little bird out of the nest.

The old birds remove the fecal sacs as they are voided by the young after each feeding, up to the fifth day, the nest remaining perfectly clean during all these days. From this time on the nest edge becomes progressively more and more encrusted with the fecal sacs which are voided by the nestlings over or on the nest edge. If the nestling be taken from the nest and fed by hand, an excremental sac is voided at once after the food is swallowed, the bird backing as though going to the nest edge, the action impressing one as being due to an irresistible impulse. One can see at once, from the soiled edge of a nest, if it has sheltered a successfully raised brood. On several occasions one of a brood has died in the nest, and afterward disappeared. It is assumed by the writer that the old birds have thrown out the dead one, but he has never been able to verify this assumption; on the other hand, dead nestlings have been found mummified in a nest in which the others of the brood have gone to full development.

The nestling is able to hold up its head and open its mouth as soon as it is free from the egg and dry. It can squirm about with considerable force within two hours after hatching, and when two days old will *crawl* feebly about and try to place its head well up on the nest edge. When eight days old, the young ones are attentive, vigorous and alert, but not yet timid, and if the nest be taken down for examination the little birds will squeak and open their mouths to be fed. If lifted from the nest at this period, they cling most tenaciously to it with the feet, and when put in the scale pan to be weighed, they are very active and crawl about in a lively manner.

At this time, too, they arrange themselves very definitely in the nest, each seemingly having its place, and each tries at once, if disturbed, to get to its place and rest its bill on the nest rim. On the tenth day, they seem 'conscious' of their surroundings, appear to be 'studying' the nest, and each other, and have acquired a noticeable degree of timidity. From this time until the nest is deserted, they move about in it, mounting to the edge where they frequently stand and energetically use the wings in a fanning man-

ner, an 'exercise' which undoubtedly leads to growth and development of the great pectorals. Many can fly well on the twelfth, and some leave the nest on the thirteenth day, though the time of leaving the nest is quite irregular. All may leave on the same day, which is most commonly the fourteenth, yet some remain in the nest until the sixteenth day after hatching. One finds almost invariably, in a large brood of five or six, that one or two of the birds have gotten a good start on the others through having been hatched earlier, and that such birds fly before the others do.

Without an exception, the writer has found that the nestling's note changes, a day or so before its first flight, from the peeping sound characteristic during nest life, to the cry of a young bird able to follow its parents, and the writer has been warned a number of times by this unmistakable change in note, that some of the young in his nesting boxes were ready to leave them.

About this time also, the young birds take instant heed of the old bird's cry of warning, if danger be near. The first flight is frequently a long and vigorous one, many nestlings having been seen to leave the nest and at once fly two hundred feet to a tree or house. Several times when this has occurred the little one has been accompanied in its initial flight by the parents, both old birds flying as close to it as possible. Contrary-wise, many times these nestlings on the first attempt at flight will drop to the ground. Under such circumstances they crawl into corners, or under bushes, or amongst leaves. How they there escape the ubiquitous cat is hard to understand, yet they do, and one can watch them about one's yard gaining strength and self-reliance from day to day. They always try, by climbing, to get as far from the ground as possible and by dint of short jumps and flights, mount from ground to bush, bush to fence, and fence to tree, where, once well established, they remain several days, being fed regularly by the old birds. It is astonishing how much cold and exposure, soaking by rains and wet snows, these young birds will stand. The mortality is very great, however, after such exposure, especially if it comes soon after they leave the nest. Many perish, too, by hail storms.

When one can study daily several developing broods of House Finches, the individuality displayed by particular nestlings is

startling: one, for example, will early show a tendency to be a 'fighter,' resisting handling, and pecking one's hand, while all the rest in the brood may be quite submissive. The color-identification scheme, hereinafter to be described, often permits one to follow and study a certain bird for some days after it leaves the nest, and has made it possible to ascertain that the young birds feed themselves at least as early as seven days after leaving the nest, though at this time they still follow the parents about, begging most persistently to be fed. Hence it follows that, if a young bird were thrown wholly on its own resources at this time, only five weeks would have elapsed from the laying of the egg until the embryo had become fully grown and able to shift for itself, this period of five weeks including two weeks of incubation, two weeks of nest life, and one week of post-nest life. It is surprising how large a number of broods will take just about this period for all their members to mature and shift for themselves. The progress of these events seems swift to the writer, inasmuch as the House Finch cannot be considered in any way precocious.

It has seemed to the writer that those birds hatched last in the brood are not so vigorous as those out first; it is possible that this notion may have arisen in the writer's mind because the first hatched have a considerable start in growth and vigor by the time the last ones break through the shells. This notion is not supported by the data accumulated by weighing the developing nestlings, if weight be taken as a criterion of vigor.

The combination of cold and wet is most disastrous to the young, and the writer has often put them from the ground into bushes during cold rainy nights, covering the overhanging branches with newspapers, giving him the satisfaction of saving several young birds, while those not covered have perished. The young soon learn where the food trays are located and go to them often, stuffing themselves to repletion.

There is a great deal of difference in the color pattern of the young birds in a given brood, one having the breast and belly markedly streaked with blackish, while in another these areas are almost pure grayish. The back may exhibit parallel variations. Once all the young in a nest of four were thrown out of it by English Sparrows; three had died before being discovered, but the fourth

seemed to recover fully on being warmed and sheltered. It was put into another nest, the young of which were of almost identical age with it, in the hope that it might be adopted and fed by the old birds of the second nest. They, however, paid absolutely no attention to it and it perished. The young of the year are often, by September, distinctly reddish on head and throat and if we assume such birds to have been hatched in the previous April, it becomes apparent that this secondary sexual character appears within the first six months of life.

SPECIAL DETAIL STUDY.

Comparative physiology is of interest and importance both to the biologist and to the zoologist. With a desire to furnish data to both, and in the end that some light might be shed on the nutritional processes of developing young birds in a wild state, a scheme of weighing young House Finches from day to day was undertaken by the writer. There are in the literature of ornithology records on the weight of young birds, the daily gain in weight of such young birds, and the amount of food consumed by them — facts appertaining especially to young Robins in captivity; but there are no such facts known to the writer relating to free wild birds. In order to learn something concerning the weight of a fresh laid egg, the weight of its embryo on hatching, the daily gain in weight of a nestling, the weight of the same bird on leaving its nest, and, finally, the weight of an adult bird of the same species, the writer carried out an interesting study bearing on these points.

With House Finches nesting in boxes, as described above, it is extremely easy to take a nest once a day, into one's house, and examine or weigh the eggs or young, without in the least interfering with the regular process of incubation or feeding.

In order to identify each bird in a particular nest, each one was marked somewhat as follows:—by using analine dyes dissolved in alcohol such birds could be colored in areas, on parts, and with such colors, as one desired; for red, fuchsin, and for blue, methylene blue was used. These dyes are readily soluble in alcohol, which quickly evaporates when applied to the young bird, and does

the bird no harm. The first bird hatched had its right thigh and side colored red, one or two applications sufficing for the whole period of nest life: the second bird had its left thigh and side stained blue, the third its right thigh and side stained red, and its left thigh and side blue, and so on.

Combinations of parts and colors numerous enough to identify several birds will readily suggest themselves to the reader. The plan worked admirably, and made it possible for the writer to follow a young bird's career from its 'hatching' until some time after it left the nest. In determining the weight of egg or bird, it was placed in the pan of an accurate balance, and the weight recorded in grains (avoirdupois). Grain weights were used, not through choice, but because they are most familiar to English readers, and most easily carried in mind by them. We have already seen that the average egg weight is 36 grains, and that the extremes were 32 and 40 respectively. It then became necessary to secure the weights of adult males and females for purposes of comparison: the only ways to learn these weights were, either to catch parent birds which were nesting about the house, obviously interfering with the study of the young in the nest, or to kill old birds known not to belong to a box nest; and the writer was unwilling to employ either of these means. Fortunately, however, an adult female, known not to belong to a box nest was caught by accident, and was found to weigh 289 grains, which is the only datum in the writer's possession to use as an adult normal. One young bird, able to fly well, was caught on the premises, and, on examination, proved not to have come from any of the study nests. It weighed 259 grains. Before it was liberated, its breast was marked with bright red, through which characteristic it was afterwards easily recognized. It lingered about the premises for over three weeks.

Two nests of young House Finches, both sets of eggs hatching almost simultaneously, were selected and studied as to the initial, the daily gain in, and the final weight of their nestlings. The following table gives the data thus obtained, together with the meteorologic conditions prevailing during the period of study:

TABLE No. 3.
Weight each day (in grains) of nestlings.

Nest	BIRD		June, 1907.																		
	No.	May 31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
"4-B-07"	1	—	35	46	62	74	109	136	154	188	211	216	237	238	257	261	248	249	*		
	2	—	43	50	75	84	134	158	188	212	235	240	249	252	263	258	*	—	—	*	
	3	—	—	39	36	73	107	130	153	188	213	221	238	243	260	263	255	249	—	—	*
	4	—	—	—	34	45	60	74	95	120	156	163	187	198	227	238	235	239	239	242	242
"5-C-07"	1	30	45	68	92	126	160	185	216	241	255	272	278	279	286	*	—	—	—	—	
	2	43	69	93	121	160	186	209	228	254	270	265	265	267	273	*	—	—	—	—	
	3	49	75	107	132	169	201	220	234	250	263	248	258	265	264	268	*	—	—	—	
	4	63	94	120	148	190	209	239	249	257	270	268	263	260	272	*	—	—	—	—	
Daily Temperature	Max.	—	75°	73	71	74	75	76	71	68	75	83	85	84	86	87	70	76	72	72	
	Min.	—	48°	46	44	48	50	47	49	45	54	50	50	52	52	57	55	52	53	53	
	%	—	64	77	80	63	85	83	51	69	100	85	100	91	99	100	77	80	82	82	
Sunshine	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Precipitation	—	—	.83	T**	0	01	.01	T	.12	0	0	T	0	0	0	0	0	0	0	0	

Note: — Weight of eggs — nest "4-B-07"—35, 35, 35, and 36 grs. (one infertile)
 — nest "5-C-07"—37, 38, 39 and 40 grains each.

Relation of weight of nestling to egg not determined.

* = Left nest. ** "T" meaning trace of precipitation.

This table of weights is of considerable interest, and, it is hoped, also of value as establishing, with these eight nestlings, a provisional curve of weights for growing House Finches. It will be seen that the least weight, at hatching, was 30 grains, and the greatest 63 grains. This wide variation *may* be explained on the assumption that the high weight was partly due to this nestling's having been fed by the old birds prior to the weighing. If we assume that the egg is hatched at night, which seems always to have been the case in the writer's experience, it is probable that the incubating female fed the young bird during the night, or shortly after dawn, both periods being before the writer took the daily weights (*viz.*, 8 A. M. each day) and one or two feedings will materially increase a very young nestling's weight.

The average initial weight of eight nestlings was 42 grains, and the average last weight (before flight) was 262 grains. If taken by broods this last average was 249 grains, and 275 grains (disregarding fractions), extremes which show considerable divergence, a difference which might almost be predicted *a priori*, when one recalls the marked difference existing between pairs of parent birds in their attention to the young. A number of other young birds have been weighed, these young House Finches having been caught about the writer's premises, and in neighboring yards, and identified as not being from nests Nos. 4 and 5. Of these young birds, two were from a nest which was attended by two old birds noticeably careless in their attentions to the young. It was apparent for days that they paid unusually infrequent visits to the nest; the two nestlings in it, on the last weighing, were found to be far below the average, one standing at 181 grains, and the other at 209 grains. Including these two obviously under weights, the average weight, determined from eleven birds able to leave the nest (not including birds from nests Nos. 4 and 5) was 250 grains. Excluding the manifestly underweight nestlings, the average of the remaining nine was 262, an interesting correspondence to the similar weight averaged from the nestlings of nests Nos. 4 and 5. The weights from nests 4 and 5 show that a House Finch will grow to within 92% (or more) of the adult weight before it is three weeks old, which, is a surprisingly rapid growth. The extremely low weight (181 grains) exhibited by one nestling able to leave the nest proves

that a young bird attaining but 62% of its normal weight can shift for itself, or can, at least, try to do so. On the other hand, one nestling in "nest 5-C-07" reached within thirteen days after hatching 99% of the adult weight (viz., 289 grains: 286 grains). Brood "4-B-07" shows us that a bird may be hatched two days before another and yet weigh when leaving the nest but 3% more than does the latter, an observation which seems to point to the fact that various members of a brood follow very closely a certain level of growth and this level of growth is also shown by the weights of each bird in relation to the weights of the others, when all left the nest.

There is, however, a noticeable difference in the "flight weights" of the members of brood "5-C-07," though it appears small when expressed in percentages, *i. e.*, 6% between the heaviest and lightest (286:268). It is to be noted that this difference occurred in the birds of brood "5-C-07" notwithstanding that all four birds were hatched within twenty-four hours; and the weights of the various eggs in this nest were too close to each other to presuppose a better start for any given ovum because of greater egg weight.

Toward the close of nest life some birds lose in weight, which may be, and probably is, due to the parents' slacking up on feeding, in their efforts to coax the nestlings to fly. A loss in weight may be due, in some instances, to an alvine discharge having occurred just before the bird was weighed, an incident noted several times during this study. Such a discharge may amount to 5 grains, actual weight.

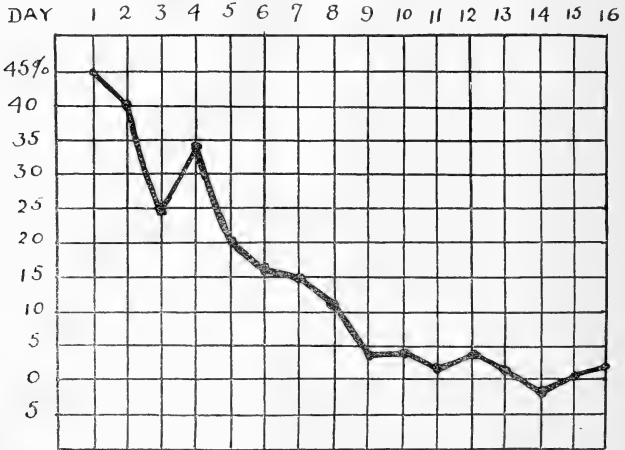
The following percent gain curve shows, as one would expect, a very large percentage gain in weight during the first days of nest life, the gain then going on a diminuendo scale to zero, or even to a loss. It is surprising to learn that a nestling may gain 60% in weight in twenty-four hours.

A singular feature shown by the percent gain curve is the spurt upward shown on the fourth day, the mean of the eight birds in broods "4-B-07" and "5-C-07" showing this spurt unmistakably. It is highly possible that this peculiarity in the weight gain would not obtain in a large series of weighing. The writer was unable to determine whether a larger egg gives its embryo a better start than does a small egg its embryo. The weights of these eight nestlings

seem to show that the method of obtaining them had no untoward effect on the growth of the birds. The meteorologic conditions prevailing during the nest life of broods "4-B-07" and "5-C-07"

TABLE NO. 4.

Average daily gain in weight of eight nestlings, gain given in percent.



seemed to have little or no influence on the development of the individuals of both broods, though the temperature went, on several nights, below 50 F.

CONCLUSIONS AS TO WEIGHT.

1. Average weight of House Finch egg — 36 grains.
2. Average weight of newly hatched House Finch — 42 grains.
3. Average weight of young House Finch on leaving nest, 262 grains.
4. Weight of an adult House Finch — 289 grains.
5. Average weight of 17 House Finches (juv.) was 92 % of adult bird's weight.
6. A young House Finch when leaving the nest may weigh within 99 % of the adult weight.

7. A young House Finch may weigh 99 % of adult weight within two weeks after hatching.

8. A young House Finch may weigh only 62 % of adult weight yet be at large and able to fly about.

9. The House Finch nestlings may lose in weight just before leaving the nest.

PARASITES.

The young and the nests of the House Finch are always infected by a minute parasite, some of which were collected and sent to an entomologist, who determined that they were not true bird lice (Mallophaga) but mites, probably belonging to the family Gamasidæ, subfamily Dermanyssidæ. Further than this, no study of the House Finches' dermal parasites has been made.

ALBINO HOUSE FINCH.

On March 12, 1907, the writer and his family observed a snow white House Finch, which was evidently a female as it was plainly mated to a normal male which accompanied it. This albino was entirely white except a suspicion of dusky encircling the base of both mandibles. Another albino female House Finch was seen the next year in a neighbor's yard. It was assumed to be the one observed the previous year.

INJURIES.

The propinquity of this species at the office and house has permitted such close observation that many of these bird visitors have become known by deformities which they had sustained from injuries; a surprisingly large number of crippled House Finches has been noted, none of which seemed to be any the worse for its handicap. Eleven crippled House Finches exhibited the following mutilations or deformities:

1 ♂ Right foot missing.

1 ♀ Right leg missing,

1 ♂ " " "

2 ♂♂ Left " "

1 ♀ One foot and one-half of tarsus missing,

- 1 ♀ Left tarsus and foot crippled and drawn up.
- 1 ♂ Right foot permanently doubled up.
- 1 ♂ Left leg paralyzed.
- 1 ♀ With crooked leg,
- 1 ♂ Right tarsus bent.

Every one of these aforesaid birds was well nourished, and seemingly quite able to care for itself. Those with but one leg were a little awkward in perching on the drinking dish, or food tray, as were also those with markedly deformed legs or feet. One with but one half a tarsus on one side used it as a stump, and did so with ease and agility. It is rather difficult to explain these mutilations; the most reasonable explanation being that the missing members were lost by being frozen. In extremely cold weather this species does suffer from cold feet, and it has frequently been seen standing on one foot while warming the other drawn up in its feathers. These crippled birds prove that considerable mutilation may occur with a wild House Finch, without soon eliminating it in the struggle for existence.

MORTALITY.

The following tabulation shows the ultimate fate of all the eggs laid in the nests under observation:

TABLE NO. 5.

Result	Cause of loss: — By					Young fly	Total
	Freezing	English Sparrows	Accidents to nest	Entangled in nest	Eggs infertile		
Year							
1906	0	6	4	0	1	22	33
1907	13	2	2	1	8	38	64
1908	15	18	5	0	3	46	87
1909	1	9	4	0	9	29	52
1910	0	10	2	0	4	31	47
Total	29	45	17	1	25	166	283
%	10%	16%	—6%—		9%	59%	

Counting fertile eggs and hatched young as potential additions to our House Finch population, we find that the mortality is very large with this species, even if estimated only to include the first four weeks after the eggs are laid.

Over forty percent of the eggs laid were ultimate failures, the largest factor in the loss being destruction of the eggs and young by the English Sparrow, a condition to be considered shortly. About ten percent loss is caused by late spring storms, climatic conditions lasting but a short time, yet long enough to cause that much loss. There are a few minor accidents which have been recorded during this study: thus one nestling perished because it could not be, or was not, freed from the sticky egg shell; another became entangled in the fibrous nesting material, and, unable to leave the nest when full grown, was abandoned by the old birds; once a box was blown down and the eggs destroyed by the fall. One young bird, recognized by its brass anklet, was found crushed in the street the same day it left the nest.

ENGLISH SPARROW *vs.* HOUSE FINCH.

There remains at least one point in the data accumulated during this study of the House Finch, which, while not relating wholly to it is of so much importance in relation to its future that it rightfully must be examined here. The question is, namely, the relation of the House Finch to the English Sparrow.

Cooke suggested (Birds of Colorado, March, 1897) that this sparrow in its westward march would perhaps "meet its first real foe" in Colorado in the House Finch. The information gathered in this study will shed some light on this question, which must be examined not only concerning the contact of adult forms, but also with regard to the nesting habits, fertility, etc. The relative length of the nesting and breeding periods is of first importance. In Denver English Sparrows are commonly seen fighting each other for nesting sites in November, December and January, and the earliest date when this sparrow has been noticed taking up material for a nest, was January 8, on which date a pair of English Sparrows was seen breeding; and also by this time of the year completed nests have often been observed. While both House Finch and

English Sparrow seem stimulated to mating and nesting by mild warm weather, yet the second species seems much more susceptible to this stimulus, and responds much earlier. At the other extreme of the year parallel conditions obtain: The House Finch has never been seen, by the writer, building a nest or having eggs in one, after August, while the English Sparrow habitually continues egg laying and incubation during this month, in September, and fresh eggs of this species have been taken during the third week in October. It would thus appear that the English Sparrow's season of nidification extends throughout almost the entire year, exceeding that of the House Finch by many weeks. It thus is apparent that the English Sparrow gets its young into the field earlier and during a much longer period than does the House Finch, which, in itself, would almost certainly cause it to win against the House Finch in a struggle between the two species. The male English Sparrow does as much of the nest building as its mate, while the male House Finch does nothing in this way to help its mate, a difference which may hasten and facilitate the completion of an English Sparrow's nest in a shorter time than that of the House Finch.

The Sparrow's large bulky nest, wherever situated, with its usual lining of feathers, is far more resistant to snow or rain than is the open Finch nest, another factor tending to promote the multiplication of the English Sparrow, under conditions in which the young House Finches perish. The English Sparrow's greater adaptability is also in its favor. This flexibility of nesting exhibited by the English Sparrow comes into prominence in its habit, in Denver, of using abandoned nests of Bullock's Oriole (*I. bullocki*) in which to raise its young.

The loss of nests, eggs and young of the House Finch through direct destruction by the English Sparrow is very large. It was 16% in some of the nests studied by the writer, and, moreover, this 16% loss of eggs does not include the very large potential loss of House Finch eggs and young brought about by destruction of nests by English Sparrows before the House Finch eggs are laid in them. One should remember also that there must be a loss of House Finches greater than 16% through the English Sparrows when they are not prevented from harassing the House Finch.

Sixteen percent of the eggs and young of the House Finch were lost on the writer's premises through destruction by the English Sparrow, notwithstanding the writer's constant and persistent attempts to destroy the latter species in his neighborhood. The writer has personally witnessed English Sparrows going into the House Finches' nests, and has seen them throw out the young, these nestlings having the heads pecked open by the Sparrows before they were thrown out. The House Finch will often put up a mild fight against the invaders, giving at the same time a very characteristic squeak but the Finch is almost invariably beaten in these battles. In many years' observations on this phase of the Finch question, the writer has but once seen a Finch whip a Sparrow. In the early years of this study, before it was undertaken systematically, the writer lost a great many nests, eggs and young of the House Finch through the depredations of the English Sparrow, and despite many and various schemes to drive away the English Sparrow and help the House Finch, he did not succeed until a powerful air gun was secured, with which the Sparrows were finally decimated in his neighborhood.

The first English Sparrows seen in Denver by the writer were noted at the Union Depot in 1894, and then a few pairs only. Today, the writer believes, there are in this city, estimating along lines similar to those used in estimating the House Finch (comparing numbers for numbers) more than one half a million English Sparrows.

It would thus seem self-evident that this exotic sparrow has flourished in Denver since 1894, and has been in no way prevented by the House Finch from increasing. On the contrary, the evidence gathered by the writer is overwhelming that the English Sparrow overcomes, and is superior to, the House Finch in the biologic struggle. That it is the winner in this fight, many of our citizens realize; but they do not realize that it brings about a retardation of the spread of a native species, whose help to the community as a weed destroyer is of far greater value than is any benefit accruing from the English Sparrow as a scavenger, or through its habit of feeding its nestlings partly on animal food.

BIRD PHOTOGRAPHY BY THE DIRECT COLOR
PROCESS.

BY FRANK OVERTON, M.D. AND FRANCIS HARPER.

MANY photographs that show the home life of wild birds are objects of great interest and beauty, but black and white pictures fail to reveal the most striking of all the characteristics of a bird — its color. Photography affords an almost perfect means of recording other important characteristics, such as size, shape, and habitat; but until recently it has been almost a total failure in recording the color of the plumage.

Hitherto the colors of birds have been represented by means of paintings and their reproductions or by means of hand-colored lantern slides. But bird-painting is an extremely slow and difficult process. The artists who are capable of adequately portraying birds are surprisingly few in number, and to satisfactorily reproduce the paintings on the printed page is almost as difficult as to make the original pictures. Consequently many of the printed pictures in color are merely keys, and few painted portraits, however pleasing their composition, are accurate in every particular. Hand-colored lantern slides are valuable and beautiful, but most of them fail to represent the bird subjects accurately or in desirable detail. Therefore, any additional means of recording vividly and minutely the natural colors of wild birds is worthy of careful study. Such a means is afforded by the use of the Lumière autochrome plates. Photographs taken upon these plates are transparencies, having the qualities of good lantern slides, with the additional quality of showing the colors in their natural tones and in pleasing detail.

An autochrome photograph may be reproduced by engraving and printing in the same way that a painting may be reproduced. But an autochrome is much fuller of microscopic detail than a painting done by hand, and this detail is too fine to be brought out by the engraver's art at the present time. An autochrome, therefore, cannot be reproduced satisfactorily upon the printed page unless it happens to be made up of masses of color without

variegated detail. But an autochrome may be used as a lantern slide, and herein lies its greatest field of usefulness. It is more dense than an ordinary slide, but a good lantern will project an autochrome photograph upon the screen with nearly all the brilliancy that the plate exhibits when held in the hand and looked through by daylight. The colors will be slightly affected by the color of the light in the lantern, but not to a greater degree than the colors of a painting are affected when seen in an artificial light.

An autochrome plate differs from an ordinary photographic plate chiefly in that a single layer of transparent, microscopical starch grains, dyed orange-red, green, and violet, and mixed in even proportion, is interposed between the glass and the sensitive coating or film. This coating is extremely thin, and is made of a panchromatic emulsion. The plate is exposed in the camera with the glass side toward the lens, so that the rays of light must pass through the colored starch grains before reaching the emulsion. Each starch grain is about $\frac{1}{2000}$ of an inch in diameter. An autochrome thus bears some resemblance to a half-tone plate, but the dots upon it are only about one fifth as large as the smallest dots upon the best half-tone plate. The density of the plate is due to the fact that the starch grains intercept a considerable amount of light.

Any plate camera may be used in taking an autochrome, and a special yellow screen, fitted to the lens, is the only extra piece of apparatus needed. If a screen is not used, the photograph will show a dominant purplish tone, owing to the excessive actinism of the violet and blue rays of ordinary light.

The main difficulty of autochrome photography lies in the length of exposure required, which is 100 times as long as is necessary for an ordinary plate. This is owing to the absorption of light rays by the color screen and by the colored starch grains. An autochrome of a wild bird is taken in the same way that an ordinary negative would be made of the same bird, except that the exposure is greatly prolonged. The fastest time in which we have taken a bird autochrome is one quarter of a second, which would correspond to $\frac{1}{400}$ of a second with an ordinary plate. On the other hand, a brooding Blue Jay in a dark thicket has posed for as long as two minutes.

The development of an autochrome is not especially difficult,

although some experience and skill are required to secure the best results. The factorial method of controlled-time development, as described in the directions accompanying the plates, enables one to control the density and contrast of the picture. The image formed by the first development of the plate is reversed in a reducing solution, and the plate is thereby converted from a negative into a positive. The first development, reversal of the image, second development, and washing, may be completed in less than fifteen minutes, and the thin emulsion may be dried in ten minutes more. An autochrome, therefore, possesses a still further advantage over a hand-colored slide in the much shorter time required for its completion.

An autochrome plate is a positive, and no satisfactory method has yet been devised for making colored prints from it directly upon photographic paper. It is well within the bounds of probability, however, that experiments which are now being conducted in this direction may eventually be successful. Fortunately, any number of duplicates may be made by photographing the first plate upon other autochrome plates, in much the same way that lantern slides are made by the use of a camera. The reproduced autochromes are not so brilliant as the originals, but they may be shown with good effect in a lantern.

We have taken several dozen bird autochromes that may be considered successful. The list includes the Laughing Gull, Common Tern, Black Skimmer, Bob-white, Fish Hawk, Flicker, Night-hawk, Blue Jay, Song Sparrow, Purple Martin, Yellow Warbler, Catbird, Brown Thrasher, and Robin. The number of our failures to secure good pictures has not exceeded the number of our successes. Our experience justifies us in stating that the autochrome method of photography affords a practical and definite means of securing brilliant and useful photographs of normal wild birds in their natural haunts, poses, and colors.

CAROLINIAN AVIFAUNA IN NORTHEASTERN IOWA.

BY ALTHEA R. SHERMAN.

THE map of the life zones of North America shows that a northward projection of the Upper Austral Zone extends up the Mississippi River to latitude 44 degrees. The northern boundary of this narrow strip very nearly coincides with that of the so called "driftless area," embracing a territory of 10,000 square miles, which geologists tell us was an island in the sea of ice during the glacial epoch; that through it the Mississippi River flows in the old channel cut by its waters ages before the glaciers came. Here and there, cut out by erosion of wind and water, still stand vast piles of rocks, often of picturesque forms with their ancient pinnacles and bartizans, saved by their insular situation from the grinding forces of the ice. Thus near the river was left a rugged country over which travel is laborious; portions of the woodlands remain in their original wildness in which some of the solitude seeking species of birds still find a home. It is a territory in which ornithological research has been very slight, the workers being too few to make a general survey, yet for future reference notes on the occurrence of southern forms of bird life in this region may be of some value, and it is the purpose of this article to give my note-book records for ten years in this field. For the most part the field of observation lies a few miles on either side of the forty-third parallel of latitude, and extends back a dozen miles or more from the Mississippi River. As stated before the land nearest the river is bluff; the belt of hardwood forest that originally covered it varied in width from five to ten miles, beyond which the country is rolling prairie.

In addition to those species, which in the strictest classification are termed Carolinian, a few words may be in place concerning the abundance of four species that in the Mississippi valley range a hundred miles or more beyond the northern boundary of the Upper Austral Zone. Of these the King Rail, *Rallus elegans*, and the Florida Gallinule, *Gallinula galeata*, are occasionally met. In some years the Grasshopper Sparrow, *Ammodramus savannarum australis*, may be estimated as a tolerably common summer resident,

while in others it is not found at all. Equally variable are the numbers of the Dickcissel, *Spiza americana*, except that this species varies from tolerably common in some years to abundant in others. Misfortune falls heavily upon it; arriving late, incubation is still in progress when the mowing machines begin their work. The first nests having been destroyed the birds leave, there apparently being no attempt made to build second nests.

The summer records for the Red-bellied Woodpecker, *Centurus carolinus*, show that it has been found in every woodland ravine visited, also found on one out of every three visits to its habitat, indicating that it is not a rare summer resident. In April, 1909, I saw one that had wintered on a farm near Steuben, Wisconsin, and the following winter two were boarders at that place. During the past winter in McGregor, Iowa, two Red-bellied Woodpeckers came daily for food to the adjoining yards of Mrs. M. E. Hatch and Mrs. M. A. Jordan.

For the past two seasons the Orchard Oriole, *Icterus spurius*, has not been seen on our place. In 1910 an old male was here on three consecutive days, and the same thing was true for three days in May, 1907. None was seen in 1905, nor in 1906. A female was here one day in May, 1908, and on the 17th of that month a male, wearing the plumage of the second year; appearing again on June 1 was a bird of this description, which remained until the 3rd of July. Very similar were the records for six weeks or more of the presence of a second year male in the spring of 1903, also in that of 1904. Late one summer previous to the decade under consideration a nest was found evidently built by an Orchard Oriole. It was beautifully woven of green grass, which was still quite fresh, but as no eggs were laid in it, nor the owner ever seen near by it was adjudged the "busy work" of an isolate female.

In the past ten years there have been numerous accounts from the Atlantic sea-board and westward of the northern advance of the Cardinal, *Cardinalis cardinalis cardinalis*. Judging from these reports it appears that this northward movement has been all along the line of its range from northern Massachusetts to the Mississippi River. Unfortunately the number of observers in this region is small; if there were more this report of the Cardinal might show that it is of more frequent occurrence.

On April 17, 1908, I saw a pair of Cardinals at the mouth of Sny Magill Creek, both male and female were singing. This creek is a small tributary of the Mississippi River, emptying into that stream six miles below McGregor. Until very recently, I had believed this to have been the first identification of the species in Clayton County. This credit, however, belongs to Mrs. Hatch, who caught a fleeting view of one in McGregor some time prior to this date. In the last week of December, 1908, a male Cardinal appeared at the food table spread for birds in the yard of Mrs. M. A. Jordan of McGregor. It remained as a regular boarder for upward of three months. Barring the brief glimpse of the Cardinal previously mentioned, this bird was of a species never before seen in that place as is established by the testimony of Mrs. Jordan, who had resided there for fifty years, and by that of several other old time residents. Similar testimony came from Blue River, and Boscobel, Wisconsin, villages situated on the banks of the Wisconsin River nearly due east from McGregor; in them for the first time it is said that Cardinals appeared that winter, two spending the cold months in the former place, and in Boscobel one was seen in March of 1909.

In the following winter the species again appeared in new fields. On November 26, 1909, a female Cardinal spent several hours in our yard in National, Iowa. This place has a prairie location, and is on the water shed between the Mississippi and Turkey Rivers; it is the only place outside of bottom lands or near streams from which the species has been reported. Sixteen days later a male came to its former boarding place in McGregor, spending one day there. On February 10, 1910, feeding with the chickens in the yard of Mr. Harry Barnum of St. Olaf, Iowa, was discovered a female Cardinal, the next day a male joined her, the pair remaining until spring weather came; four weeks or more. St. Olaf on a tributary of the Turkey River lies directly west of the mouth of Sny Magill Creek, distant ten miles in an air line. It is the most westerly point in this region from which this species has been reported.

All records for the succeeding two winters were made in McGregor so far as has been learned. In November, 1910 a pair appeared and were seen at intervals during the winter. Late the following

November one Cardinal returned to his old winter quarters, and before many weeks was joined by two females, the trio spending the long cold winter there. Possibly the amount of cold these birds survived was greater than that endured by Cardinals elsewhere. They experienced on twenty-six mornings in the first six weeks of 1912 zero weather or much colder than that, the mercury falling to 38 degrees below zero on two mornings, while 30, 24 and 25 degrees below were marks reached on other mornings, the averages for the twenty-six mornings being 13 degrees below zero. The summer of 1912 is the first summer in which a pair has been in evidence. "We have not missed seeing them for more than two weeks at a time": is the statement of Miss Eva R. Jordan. That the Cardinal is increasing in numbers, and has become a permanent resident seems to have been established beyond question. No nests of the species have been identified. The finding of them, probably, will be by accident, since hereabout the Mississippi is crowded with many islands, offering ideal summer habitats for these birds: places rarely visited by mankind in which search for a nest would make that for the proverbial haystack needle too simple a matter for comparison.

In the wooded ravines in which occur the Red-bellied Woodpeckers is to be found the Louisiana Water Thrush, *Seiurus motacilla*. Wheresoever the swift waters of a brook wash for some distance the base of a well shaded bluff, there in masses of drift-wood may be found nesting a pair or two of this species. Where the forest has been cut away, and thickets of underbrush have sprung up on several occasions I have thought I saw the Yellow-breasted Chat, *Icteria virens virens*, yet always so far away that identification was not positive. It remained for May 7 and 8, 1912, to become red-letter days for the Chat. On those days one was seen in our yard, was viewed through binoculars and without them as it appeared at various times from twelve to twenty feet away. As a species it must be counted quite rare.

Perhaps the northern invasion of the Carolina Wren, *Thryothorus ludovicianus ludovicianus*, has been as great as that of the Cardinal, if so it has not been noted. There is but one positive record for this species. It was on December 2, 1911, in the same yard in McGregor in which the Cardinal appeared, that the Carolina Wren

was first seen by Miss Jordan, and it was viewed for several minutes at very close range by herself and Mrs. Hatch.

Another rare species is the Blue-gray Gnatcatcher, *Polioptila cærulea cærulea*. An individual of this species was here on August 31, 1908, and for some time was watched through powerful binoculars when no farther distant than twenty to fifty feet.

The last case may possibly be considered by some people as a hypothetical one: It was outside this decade and before the days of the binoculars; but the strange, little, gray bird that through long, hot, August days so constantly sang the unfamiliar notes of 'peto, peto' will always be thought by me to have been a Tufted Titmouse that had wandered north of its customary range.

A DIFFERENT ASPECT OF THE CASE OF ROOSEVELT VS. THAYER.

BY THOMAS BARBOUR.¹

MR. Francis H. Allen, in 'The Auk' of last October, has published some comments on the 'case of Roosevelt vs. Thayer, with a few independent suggestions on the concealing coloration question.' Mr. Allen's remarks are very unfair to all those who are unable to agree with Mr. Thayer's conclusions. His independent suggestions are, for the most part, unimportant, and add little to the arguments for either side.

In the beginning of Mr. Allen's recent paper, we find ourselves compelled to take issue with him on the question of what is 'common sense.' He says, "In Columbus's day common sense declared the world was flat." This was a dictate of science, and was as worthy of being believed at that time and in that state of knowledge

¹This would probably have been a paper written jointly with Dr. J. C. Phillips had he not left a short time ago for the Sudan. I assume sole responsibility for it, as it stands. A large part is written from notes which we made together some time ago, and for the permission to make free use of these I thank Dr. Phillips very heartily.

as the fact that the world is round is of being believed now. Again "more recently it [common sense] carefully protected the consumptive from 'night air.'" Here Mr. Allen is unfortunately unable to distinguish between superstition and common sense. Some of us have had great-great-grandmothers who were so unfortunate as to have lived in Salem. There they were hanged as witches, and yet this somewhat common practise can hardly be laid to the door of the 'common sense' of those times, but rather to superstition, which is, as yet, often persistent. We absolutely disagree in believing that common sense is "still an obstacle to the spread of scientific education." We consider it science's most powerful ally as superstition is her worst enemy. We agree heartily with what is said regarding the "arrogant attitude he [Thayer] seems to take in regard to the relative claims of the artist and the biologist to be entitled to form an opinion on the subject of coloration,— even more prejudicial, if less irritating, is the — shall I call it cocksure? — way in which mere conjectures are stated as facts." We also agree with Mr. Allen absolutely that a fair attitude towards Mr. Thayer must begin by admitting that he is an expert colorist, and that his perception of color and the value of light and shadow is probably as far ahead of the average scientific person's perception as night is from day; yet we must remember that Mr. Thayer knows nothing of any other than human color perception, and his haphazard assumptions that mammals, birds, reptiles, and insects see in the same way as human beings do, is just what grates most harshly upon the intelligence of the average scientific person.

We read later "I have detected in Roosevelt's paper and the reply to Thayer's criticism, appended thereto, upwards of fifty instances of misquotations, misrepresentations and perversions of Thayer's statements, and pieces of faulty reasoning in matters of detail." These are serious charges, but we must point out that the offences vary greatly in magnitude. It is a great pity that Mr. Allen did not state how many misquotations and how many pieces of 'faulty reasoning in matters of detail' he found. A misquotation would probably be wilful, while a bit of 'faulty reasoning in a matter of detail' might be an instance of where Mr. Roosevelt's opinion was at least worth as much as that of either Mr. Thayer or Mr. Allen.

Later Mr. Allen says, "Then, on page 162 we are told that the

Scissors-tailed Flycatcher is conspicuous in *shape*, but we are not informed, how a bird can be conspicuous in shape." I can answer this question easily by simply stating that a bird can be conspicuous in shape by being like a Scissors-tailed Flycatcher. I strongly mistrust that Mr. Allen has never seen one of these birds in life; their conspicuous shape and their still more conspicuous method of displaying it in their open Plains habitat would have saved Mr. Allen from making such a naive display of his ignorance, had the opportunity for observation ever been presented to him. Mr. Roosevelt is absolutely correct, when he says that the bird is conspicuous 'in color and in habit, has no concealing coloration, and never conceals itself.' Mr. Roosevelt has obviously seen the bird in life. I also have had the good fortune to observe it. This is not a case where Mr. Roosevelt can be called 'stupid.' In a later paragraph we are given another example of 'Roosevelt's dogmatism.' His statement that the typical red fox and the cross fox are 'equally successful in life' is challenged, and we are asked if equally successful, why is not the cross fox as common as the red fox. We can answer that we have no evidence to show that the cross fox is shorter lived, less vigorous, or less well able to catch food than the red fox, or that it is in greater danger from its enemies. The reason why it is less common is purely and simply determined by laws of heredity, which govern the numerical relationship which a 'sport' bears to the parent stock, when no artificial factor steps in and provides for 'sports' only, mating together. We disagree absolutely with Mr. Allen's absurd quibble that "a very little reflection would have shown . . . that no two species ever live under precisely the same conditions." Why not? We believe that very many birds and, indeed, that many animals of all groups live under conditions so near alike that slight differences could not possibly prevent the same biological forces working equally upon all of them. In the matter of color gradation and counter shading, we admit that Mr. Thayer has made great discoveries in optics. Counter shading is certainly not universally existent. Mrs. Barbour, however, has recently called my attention to its frequency among such garden vegetables as melons, cucumbers, gourds and the like and how ineffectually it conceals them. Its effect is certainly destroyed in many in-

stances by an animal's crouching or lying down, but the most important of all seems to be the fact that it does not seem as effective for an animal seen from end view as it is in one seen from the side, and yet, of course, the animal is in as great danger from enemies which may come head on, or from behind, as from those approaching from the side. Mr. Thayer has perhaps never thought of this: Mr. Roosevelt probably has.

Mr. Allen is evidently blessed with that type of mind which wants to see things definitely settled one way or another once and for all. From his writings we presume that he believes that a definite theory is, by the fact of its being definite, worth more than a vague theory. The truism 'I don't know' certainly does not appeal to Mr. Thayer, and apparently it does not to Mr. Allen. Both want to swallow the theory of natural selection reduced to its lowest terms, hook, bait, and sinker, and bring us to believe that this is an universal law, all powerful in its results or effects. No scientific man, or at any rate very, very few, will follow their ridiculously cocksure attitude in regard to this belief. Mr. Thayer's declaration for 'natural selection, pure, simple, and omnipotent' is a dogmatic statement more jarring to scientists in our present incomplete state of knowledge than Mr. Roosevelt's assertions are irritating to Mr. Thayer. Sexual selection is an entirely different problem. It has been observed in actual operation, and if Mr. Thayer cares to study the habits of many birds and animals, he can see it working for himself,—if he is open minded. We believe that coloration is found to be a negligible factor in the life economy of an immense number of species, of which the crow is an excellent example. Keen wits, in this case, make other protection unnecessary. If we mistake not, Darwin has said that sea birds need no protection, hence their conspicuous coloration; and when we are advised to distribute a number of skins of "forest birds and sea birds impartially in the tree tops in some thick wood and see whether there actually is any difference in their conspicuousness or not," we only say that birds of the field or marsh, if put in the forest in some such way as this, would be equally well protected with the forest birds so far as their coloration goes, and that the conspicuous color of the sea bird is well matched by species of the family Cotingidæ which live in the green woods of South America.

We have been advised by Mr. Allen that ridicule is a powerful weapon and sorely as we are tempted, we are trying to keep away from this sharp-cutting blade. When Mr. Allen says, "the fact that Mr. Thayer may have been mistaken in regard to the habitat of the Peacock does not vitiate all of his experiments," he should have added, truly it does not, yet it certainly does *vitate* the one that had to do with *the Peacock*, and this was *all* that we expected it to do. We must take a crack at the now famous Blue Jay, and his shadow on the snow. The jays are a tropical family, species of jays with blue or green coloration occur wide-spread in both tropical and temperate regions. The Florida Blue Jay is almost exactly similar in plumage to the species hereabouts. It lives where there is no snow, as does our Blue Jay a full half of the year. We are frank to admit that our Blue Jays hereabouts do occasionally match the shadows on the snow if seen in exactly the right position, but 'common sense' tells us that this fact has absolutely no biological significance whatever. In regard to the white rump of the deer, I must add just this suggestion to what may be said regarding deer and their enemies. Deer are hunted by wolves more than by other species of animals. Wolves hunt in packs. The deer's white rump might, under certain rather rare circumstances, fool one wolf out of a pack for a short moment during the pack's pursuit. It might at vastly rarer intervals fool all the individuals of the pack were all their eyes at the right level at exactly the right time, but that it could fool all the members of a keen-nosed pack of hungry wolves long enough to allow of the deer's escape is again a matter where I think 'common sense' must certainly be called in. Personally I have experimented with captive deer under wild conditions; *i. e.* in a large park. I have had excellent opportunity for observing them carefully under many conditions with Mr. Thayer's theories in mind. I have also had color varieties of the European fallow deer, which were both counter shaded and solid colored, some pure white, some deep chocolate brown all over, and some with brown backs shading to light bellies. In every case, the solid colored, chocolate brown individuals were the most difficult to see, especially at dusk, the regular time when the wild deer begin to move about and feed. Mr. Allen backs water very hard when he says, of the possibility

that foxes and dogs may locate their prey by scent, that this may militate seriously against Mr. Thayer's contention that the final spring on all occasions is directed by sight alone. I think the important point here really is that we find no evidence that beasts of prey are unable to maintain themselves perfectly successfully in spite of the operation of all these supposedly adverse conditions. If an animal can get all the food it needs, what more does it want? So much for our remarks on Mr. Allen's paper. They are somewhat disjointed and perhaps prolix. We could pick him up on many other points, but this serves to show that his desire to simply bolster up the arguments of a friend would have been more convincing had they been more impartially conceived.

Some time ago, Dr. Phillips and I reviewed Mr. Thayer's book (Auk, April 1911). We put a number of direct questions to Mr. Thayer at that time which we hoped he would answer, both for his own sake and as an evidence to naturalists in general of his sincere desire to really keep this discussion going, to open up the whole matter of coloration so far as possible, to suggest fields of inquiry and experimentation, and not simply to sit down on the top of a heap of facts, which he claims to have discovered and take the attitude that the whole business is settled. Mr. Thayer claims to be interested only in what he terms facts, whys and wherefores receive practically no attention. Franklin did not discover lightning, but he proved its causation through its connection with electrical phenomena, and for that reason became very great. The least increment to our knowledge of how differences are brought about by evolution, actual endeavours to prove experimentally, if possible, the working of evolution relating to the origin of coloration would be worth more than many pages devoted to proving that an oryx's head may be well concealed in a pine tree. Since Mr. Thayer published his book, he has given us a figure (Pop. Sci. Mon., July 1911, p. 21) showing a lion approaching three antelopes uphill. The 'lion's horizon line' and the level of the plains, 'appearing to meet the level of the lion's eye,' make an angle with each other of about 20 degrees, and under these conditions, according to the 'great optical principle' which 'I have discovered' the antelopes are rendered invisible to the lion through their counter shading. Supposing, however, that the

light was coming from the direction of the antelope towards the lion, or that the ground sloped in the opposite direction; i. e. from the lion towards the antelopes, or supposing that the ground was level or undulating, or supposing, again, that the lion was watching for its prey from some eminence, overlooking the feeding ground of the antelopes, then the protecting value of this coloration would be nil. As a matter of fact, lions kill nightly, or whenever they care to. No traveller has ever found them starving to death or unable to provide as much food for themselves and their young as they needed.

The rabbit's greatest enemy in England is the stoat, in New England, the weasel. These enemies hunt by scent alone. They are the only enemies which the rabbits have that would have a visual horizon line low enough for the rabbits white tail etc. to act in an obliterative manner. Every game keeper in England will tell Mr. Thayer, if he asks, that once a stoat takes up a rabbit's trail, the rabbit is absolutely sure to die. Of course, experiments made with dummies and dead skins do not bring out this fact. Using no living animals Mr. Thayer does not realize that color perception and the range of vision vary widely among different organisms. We call his attention to the enormous mass of past and current literature in animal psychology, having to do with experimental work in just such matters as the color perceptions of animals. Could he not correspond with some of these workers, Prof. R. M. Yerkes of Cambridge, for example, to their advantage and to his.

The question is not always are all organisms protectively colored, but do protective colors protect? This, perhaps, is capable of being tested by carefully controlled experiments conducted with living animals under conditions as nearly as possible natural. We do not wish for interpretations in terms of human vision. We do not care to know what is perceptible to the splendidly trained artist but rather what animals themselves see and how other organisms appear to them. So far, our meagre knowledge permits us to say that we have no direct conclusive proof of the efficacy of special coloration. Davenport, in investigating the number of fowls killed by vermin, i. e., weasels, etc. thought that there was the greatest mortality among the solid colored birds, but Pearl, with

a larger set of figures, found that there was no relative immunity among the 'pencilled birds.' In fact, his figures rather favored the solid colored birds.

He shows (*Amer. Naturalist*, Feb. 1911, p. 117) that "ever since the first description made by the Nurenbürg miniature painter, Rösel, in 1746 of a case of presumably protective coloration, we have been prone to argue that because an organism was colored or formed in such a way as to be inconspicuous, it was therefore necessarily *protected* from attack by its enemies to a greater or less degree. The logic of such reasoning is flawless; it ought to be protected, but a conclusion may be perfectly logical and still not true. In a study of protective coloration, including mimicry, it is essential that a discovery that an organism is to human eyes inconspicuous, or not readily distinguishable from some other organism, shall not be considered the final goal. Let such a discovery be supplemented by an experimental or observational determination of whether this inconspicuousness really helps the organism in actual practise in avoiding elimination by natural enemies." In many cases we have no theories to substitute for those of Thayer, but we do not hesitate, however, to say that the burden of proof rests on him. The evidence is all against him, though it is for the most part of a negative sort. Meagre and negative as it is, however, it is worth a great deal more than pure, unfounded speculation based upon what is seen by a trained man's eye interpreting animal vision. Thayer's color experiments are not really scientific experiments in any biological sense. They are mathematical demonstrations in human optics, pure physics and nothing else. As aesthetic, physical demonstrations, they are of great interest, but as to their interpretation in terms of the organic universe they are of little interest and of no value. Thayer's point of view is summed up in one sentence of his own words (*Pop. Sci. Monthly*, July 1911, p. 35) "I have been studying for years to find out the exact scene that each costume best represents, and I now beg my readers to come to Monadnock and let me show them the results."

The evidence in Sumner's paper (*Jour. Exp. Zool.* May 20, 1911) regarding the color response of flat fish, when placed on different background both natural and artificial, is a model which Mr. Thayer might well study. Sumner, though he has seen at first

hand perhaps the most remarkable case of protective coloration on record is careful not to generalize or to force on the reader any such protective value to account for the facts. He concludes his discussion by saying that his few statements illustrate the paucity of our direct evidence on the whole question of protective coloration, and remarks that most of our conclusions are entirely of an inferential nature.

The results of Prof. J. Reighard's studies, at the Tortugas Islands, of the coloration of reef-fishes are very important in this connection and worthy of careful examination. Will Mr. Thayer inform us whether or not he has seen this work?

As to mimetic resemblances our best theories have been entirely inferential in nature. We have jumped at conclusions, obvious enough though they seemed at first sight. In his "Darwinism of Today" Kellog calls attention to a case of overspecialization as an argument against natural selection. He describes the well known Kallima butterfly. After showing how unnecessarily perfect the butterfly's resemblance is, he says "When natural selection has got the Kallima along to that highly desirable stage where it is so like a dead leaf in general seeming that every bird sweeping by sees it only as a brown leaf clinging precariously to a half-stripped branch, it was natural selection's bounden duty in conformation with its obligation to its makers to stop the further modifying of the Kallima, and just to hold it up to its hardly won advantage. But what happens, Kallima continues its way, specifically and absurdly dead leaf-wards, until today it is much too fragile a thing to be otherwise than very gingerly handled by its rather anxious foster parents, the Neo-Darwinian selectionists." My own experience has been that Kallima often, perhaps even generally, rests with wings open or fanning.

It seems a pity to return to the case of the zebra. We draw the following conclusions from the observations of careful naturalists:

I The zebra is one of the most plentiful of all the plains' dwellers.

II That he and the hartebeests form in many regions almost the sole food of the lions.

III The lion kills at will and with little effort. This is shown by numberless actual observations.

IV The zebra shows little concern in the lion's presence. He

feeds down wind to water holes and thick covers, and, in fact, takes not the slightest precaution for his own safety.

These observations seem to be absolutely all that we know regarding the relations which the habits of the lions and the zebras bear to one another. It is hard to fit in any clause relating to protective coloring which would seem to be capable of support by observations, to account for more than the fact that Mr. Thayer has been able to conceal dummy zebras successfully in New Hampshire under various conditions of his own arrangement. We are all mentally prone to inferential methods, this is a common failing of the human mind, and one to which an artist dealing with physical and mechanical phenomena naturally would be very prone. The artist dealing only with the visible and the superficial would naturally turn to the arguments of pure logic rather than to animal experimentation. He lives in an Arcadian land where no conflict of facts or deeply concealed natural laws concern him in the least. The obvious and the all embracing theories are the ones that appeal to him most. We have often pondered on how color patterns may have originated. Mr. Thayer has doubtless done the same thing. His theories demand that we should admit the existence of a constant inter-specific struggle and a selectional value for incomplete color schemes, but we feel grave doubts as to the efficacy of natural selection *alone* in bringing about the species of the present time. Mr. Agassiz often said that natural selection probably explained the survival but not the arrival of species. One cannot account for the arrival of a new organ nor the loss of an old one by Darwinian selection alone. The question of the origin of new characters in general is a problem of the greatest depth and importance, and one that is here out of place, yet how especially difficult is it to imagine with Thayer's reasoning the origin of a new color pattern of doubtful value when complete, and of no selectional importance in its elemental state.

We find birds of such varying types of colorations, living under the same conditions as far as the operation of broad selectional principles are concerned, that it is fair to assume that all cannot be equally protected. There are in the upper leaf zones of the tropical forest, birds of which the following are but a few of the colors displayed in their plumages. One may find white birds and black

birds, pink birds, green and yellow, and black and red, and black and green, and magenta birds, sky blue birds and brown birds of many shades, and many with a bewildering number of conspicuous shapes. We use these words advisedly. Can these birds all be equally protected under the same or almost the same conditions? We ask Mr. Thayer frankly to tell us that if such and such types of coloration are concealing, as he says they are, are not perhaps such and such other types of coloration equally conspicuous; and then let us see whether in the environment under discussion, we cannot perhaps find these or similar types of coloration displayed by birds apparently as successful as those supposedly protected by coloration. In other words, we ask Mr. Thayer to answer our questions, to meet our arguments fairly and squarely, and not simply to fall back on dogmatic assertions, based upon his interpretation of the physical laws of human optics. It may seem futile to keep bandying words back and forth. The subject is one, however, which is well worth the opening up it is just beginning to receive. We have been severely criticised by Mr. Thayer for our previous review of his work. We hope now that he will come forward and meet our arguments, not with other examples of his own discoveries, but with definite answers to the questions which we have put to him, now and hitherto. Why should flamingoes be pink, if they lack enemies? Why should sea birds be protected when many of them apparently have no enemies at all? How can black birds, white birds, green birds, and brown birds all be equally protected in the same forest by the same light rays filtering through the same green foliage?

ON THE GENERIC NAMES *IBIS* LACEPÈDE, AND *EGATHEUS* BILLBERG.

BY GREGORY M. MATHEWS, F. R. S. (Edin.).

WHEN Lönnerberg (Journ. für Ornith., 1906, pp. 531-533) introduced Billberg's work to the notice of twentieth century Ornithologists, he showed *Egatheus* Billberg, 1828 was equivalent and anterior to *Plegadis* Kaup, 1829 and should therefore replace the latter.

For a time this was accepted, but when Richmond examined the work he recorded (Proc. U. S. Nat. Mus., Vol. XXXV, p. 607, 1908) that *Egatheus* on tab. A. was a "New name for *Ibis* Lacepède (used for *Tantalus falcinellus* on p. 158)", with a footnote quotation giving Billberg's reason for its introduction: "Dissentientibus auctoribus, quænam esset Egyptiorum *Ibis*; hoc nomen avis in historia insignis justius ut specificum conservari credidimus, adeoque *Egatheum* a græco *ηγθαθεος*, sacer, prætulimus."

Consequently, *Plegadis* Kaup was continued for *P. falcinellus* by American ornithologists (A. O. U. Check-List, 3rd Ed., p. 92, 1910).

When I made up my 'Reference List' I was not satisfied as to the rights of the cases and allowed the use of *Egatheus* Billberg until such time as I should have occasion to monograph the birds in my 'Birds of Australia.'

However, under date Oct. 3rd, 1912, my friend Dr. Chas. W. Richmond wrote me as follows: "*Egatheus* will never do in place of *Plegadis* Kaup 1829. Billberg used *Egatheus* as a classical substitute name for *Ibis* Lacepède. The name occurs on table A, which is (with tables B & C) designated at the bottom as 'ante pag. 1,' so the contents of the tables are to be dealt with before the body of the work. Billberg did not intend to separate *Egatheus* from *Ibis*, but in the body of the work (p. 158, not 166) he only had the Glossy Ibis to deal with and called it *Egatheus*, because *Ibis* was not classical." This was followed by a letter dated Oct. 5th, 1912: "I think a further note on the subject of *Ibis* Lacepède may be of interest to you, inasmuch as what I wrote you about *Egatheus* did not cover the whole case. I am not able at this moment to clear

it all up, but I think *Ibis* Lacepède will prove to be a synonym of the *Tantalus* of Cuvier's *Tabl. Élém.*, 1798, or in other words will have for its type the *Tantalus ibis*, and thus will replace *Pseudotantalus* Ridgway, and remove *Ibis* from the family of Ibises! This will result as follows:—

Tantalus ibis will become *Ibis ibis*, with *Pseudotantalus* and *Egatheus* as syn.

Ibis aethiopica will become *Threskiornis aeth.*

The family name of the Ibises will become probably *Plegadidae*.

“In Lacepède's *Tableaux*, 1799, you will find no mention of *Numenius*, but the ‘Courlis’ group is called *Tantalus*, and the ‘Ibis’ is given the new generic name *Ibis*. In Cuvier's *Leçons*, 1800, the ‘ibis’ is called *Tantalus*, and the ‘courlis’ *Numenius*. To settle the question it will be necessary, I think, to consult the introductory part of Lacepède's 1799 paper (not accessible here) and see if he did not take his vernacular group names from Cuvier's *Tabl. Élém.*, 1798, also to consult the ‘Didot’ edition of Buffon (Sherborn knows all about this work) and see if either Lacepède or Daudin did not deal further with *Ibis* there. The Didot edition is not to be had here.”

Such an interesting problem deserved immediate attention and herewith are given the results of my investigations.

To deal first with Lacepède's *Tableau*, 1799. The introduction does not give any clue to the origination of Lacepède's divisions; no references to contemporaries are included. From a comparison of the tables in Cuvier's *Leçons*, I suggest that Cuvier borrowed from Lacepède, rather than vice versa. The Cuvierian (1800) groups seem to approximate quite closely to the Lacepède (1799) groups and not as closely to the *Tabl. Élém.* (1798) ones. It seems that Cuvier framed his tables after Lacepède had laid his before the Paris Institute in 1798 (Sherborn, *Natural Science*, 1899, pp. 406–409), where Cuvier would see them. It does not matter much, however, as there is nothing yet known to decide either way.

In the ‘*Tableau*’ the diagnosis of *Ibis* reads “Le bec long, fort, tranchant, et émoussé à son extrémité, des plumes dénuées de plumes sur la tête.”

This is too broad a definition for exact work, so that it is satisfactory to have more data given almost simultaneously by Daudin. An edition of Buffon was apparently printed off by Plassan in 1799 and not issued completely; it was then taken over and issued by Didot. The full history of this complex transaction has been unravelled by Sherborn (*loc. cit.*) and Richmond (*Auk*, 1899, pp. 325-329; also *Auk*, 1900, pp. 166-167). According to the latter the XIVth volume of the *Quadrupedes* was not issued until 1802, and included in that volume were *Tableaux des Mammifères... et Oiseaux*.

The latter is entitled "Tableau | des | Sous-Classes, Divisions, | Sous-Divisions, Ordres | et Genres | Des Oiseaux, | par le C^{en} Lacepède; | Avec l'indication, de toutes les espèces | décrites par Buffon, et leur distribution | dans chacun des genres, | par F. M. Daudin."

On p. 334, we find the genus *Ibis* and thereunder are included:

Le Couricaca	<i>Ibis loculator</i>	XIV, 182
L'Ibis blanc	<i>candidus</i>	XV, 188
L'Ibis noir	<i>niger</i>	193
Le Courlis rouge	<i>ruber</i>	212
Le Courlis des bois	<i>cayanensis</i>	222
L'acalot	<i>mexicanus</i>	225
Le grand courlis de Cayenne	<i>albicollis</i>	228
Le matuitui des rivages	<i>griseus</i>	227
Le courlis brun a front rouge	<i>fuscus</i>	221
Le courlis blanc	<i>albus</i>	XV, 219
Le courlis verd, ou courlis d'Italie	<i>falcinellus</i>	204
Le courlis brun	<i>manillensis</i>	206
Le courlis a tête rue	<i>calvus</i>	208
Le courlis huppé	<i>cristatus</i>	210

The reference is to the volume of *Birds* where the bird is described under the vernaculars given.

From among these then I conclude a type of *Ibis* Lacepède must be selected. It may be that the better reference would be to *Ibis* Daudin but it matters little.

It will be at once noted that *aethiopica* Latham is missing and consequently so far Richmond's conjecture is correct and *Ibis* Lacepède (or Daudin) cannot be used any longer in the general acceptance of that name.

Though the majority of the species above belong to the family Ibididae (auct.), only two are called in the vernacular by Buffon *Ibis*, *L'Ibis blanc* and *L'Ibis noir*. Moreover, under the generic heading *L'Ibis*, Buffon had written "Nous avons dit que les Anciens distinguoient deux espèces d'ibis, l'une blanche & l'autre noire."

Further, *L'Ibis blanc* is the *Tantalus ibis* of Linné; consequently, by tautonymy, this becomes the type and Richmond's suggestion is confirmed; therefore *Ibis* Lacepède, 1799 (or Daudin, 1802) must replace *Pseudotantalus* Ridgway (Proc. U. S. Nat. Mus., p. 550, 1883). *Egatheus* Billberg was absolutely introduced as a substitute for *Ibis* Lacepède and must therefore follow that name and disappear as an absolute synonym. I was not certain of this before, but Dr. Richmond has satisfied me that such was the case.

It might be noted that in the Cat. Birds Brit. Mus., Vol. XXVI, p. 4, 1896, *Ibis* was used as of Cuvier, 1816; that was an altogether different introduction, the type being *I. aethiopica* (Latham) by tautonymy. But there was a prior *Ibis* of Illiger, 1811, which was overlooked if *Ibis* Lacepède was ignored as unidentifiable, and Illiger quotes *Ibis* Lacepède in his synonymy.

Gray, in the Appendix List Genera Birds, p. 13, 1842, introduced *Threskiornis* for *Tantalus aethiopicus* Latham, and in the Cat. Gen. Subgen. Birds, p. 115, 1855, noted 'Ibis Cuv. 1817' as a synonym of this group. This name must now be resumed. It will therefore be seen all of Richmond's suggested changes are necessary:

Ibis Lacepède, Tableau Oiseaux, 1799 (or Daudin Hist. Nat.).

Type (by tautonymy), *Ibis candidus* Daudin, 1802 (= *Tantalus ibis* Linné).

Synonyms: *Ibis* Illiger, 1811 and *Egatheus* Billberg, 1828, will replace PSEUDOTANTALUS Ridgway, 1883.

Threskiornis Gray, Appendix List Genera Birds, p. 13, 1842.

Type (by original designation), *Tan. aethiopicus* Latham.

Synonym: *Ibis* Cuvier, 1816 not *Ibis* Lacepède, 1799, etc.,

will replace IBIS (Cuvier) Cat. Birds Brit. Mus., Vol. XXVI, p. 4, 1896.

PLEGADIS Kaup, 1829, will remain as used in the Check-List North Amer. Birds, 3rd Ed., 1910, p. 92, but the Family name of the Ibises, *ibid.*, p. 91, will become PLEGADIDAE.

THIRTIETH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE Thirtieth Stated Meeting of the American Ornithologists' Union convened in Cambridge, Mass., Monday evening, November 11th, 1912. The business meeting was held in Mr. William Brewster's museum, and the public sessions, commencing Tuesday, November 12th, and lasting three days, were held in the Geological and Zoölogical Lecture-rooms of the University Museum.

BUSINESS SESSION. The meeting was called to order by the President, Mr. Frank M. Chapman. Sixteen Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 929, constituted as follows: Fellows, 46; Retired Fellows, 2; Honorary Fellows, 16; Corresponding Fellows, 59; Members, 77; Associates, 729.

During the year the Union lost sixty-six members, five by death, twenty-three by resignation, and thirty-eight for non-payment of dues. The deceased members include two Corresponding Fellows, one Member, and two Associates, as follows:

Prof. Alfred Dugès,¹ a Corresponding Fellow, who died in Mexico, January 7th, 1910, in the 84th year of his age; Dr. Wilhelm August Blasius,² a Corresponding Fellow, who died in Brunswick, Germany, May 31st, 1912, aged 67 years; Bradford Torrey,³ a Member, who died in Santa Barbara, Cal., October 7th, 1912, aged 69 years; and the following Associates: Mrs. Ellen Sheldon Farwell, who died at Lake Forest, Ill., August 6th, 1912, in her 53d year; and Capt. H. W. Small, of Staunton, Va.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

All of the officers were re-elected, as follows: Frank M. Chapman, President; A. K. Fisher and Henry W. Henshaw, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, F. A. Lucas, Chas. W. Richmond,

¹ For an obituary notice, see Auk, xxix, p. 434.

² For an obituary notice, see Auk, xxix, p. 571.

³ For an obituary notice see 'Notes and News' below.

Thomas S. Roberts, Witmer Stone, and Wilfred H. Osgood, members of the Council.

Edward Howe Forbush, Westboro, Mass., Louis Agassiz Fuertes, Ithaca, N. Y., and C. William Beebe, of New York City, were elected Fellows; M. A. Carriker, Jr., of Santa Marta, Colombia, was elected a Corresponding Fellow; Frederic H. Kennard, Newton Centre, Mass.; Dr. John C. Phillips, Wenham, Mass.; Norman A. Wood, Ann Arbor, Mich.; Alexander Wetmore, Lawrence, Kansas, and Miss Althea R. Sherman, National, Iowa, were elected to the class of Members, and the following one hundred and eighty-six persons were elected Associates:

Edward Raymond Adams, Washington, D. C.
 Mrs. Emily C. Hall Armstrong, Hyde Park, Mass.
 Mrs. Caroline Wheeler Babson, Pigeon Cove, Mass.
 Chas. H. M. Barrett, Medford, Mass.
 Miss Mary F. Bartlett, Boston, Mass.
 Ernest Harold Baynes, Meriden, N. H.
 Prof. W. B. Bell, Agricultural College, North Dakota.
 Rolan H. Blood, Pepperell, Mass.
 Mrs. Elizabeth Quincy Bolles, Cambridge, Mass.
 Miss Louise Bond, Fort Wayne, Ind.
 F. G. Bonfils, Denver, Col.
 Spencer Borden, Fall River, Mass.
 Henry S. Borneman, Frankford, Pa.
 Mrs. Harriet T. Boyd, Dedham, Mass.
 Charles T. Boynton, Highland Park, Ill.
 Prof. M. A. Brannon, University, No. Dak.
 William Foreacre Brantley, Pine Knoll, Ga.
 Mrs. William Brewster, Cambridge, Mass.
 Gorham Brooks, Boston, Mass.
 H. A. Brown, Lowell, Mass.
 Mrs. Henry Temple Brown, Winchester, Mass.
 Charles O. Burbank, Newton Centre, Mass.
 Mrs. J. W. Burekes, Waltham, Mass.
 John Bird Burnham, New York City.
 Jefferson Butler, Detroit, Mich.
 Joseph Fletcher Calvert, London, Ontario.
 Rev. Robert Francis Cheney, Southboro, Mass.
 Grace E. Chipman, Sandwich, Mass.
 Mrs. Annie M. L. Clark, Lancaster, Mass.
 Laura F. Craft, Glen Cove, N. Y.
 Mrs. Nettie S. Cressy, West Hartford, Conn.

Stanley Coulter, Lafayette, Ind.
Wallace Craig, Orono, Me.
Mrs. David Crocker, Barnstable, Mass.
Mrs. Emmons Crocker, Fitchburg, Mass.
Mrs. H. P. Cross, Providence, R. I.
Miss Ada Dana, Newton, Mass.
Mrs. Helen P. Dane, Chestnut Hill, Mass.
Mrs. Frances Stillman Davidson, Springfield, Ill.
Prof. L. Dorn, Fort Wayne, Ind.
Sarah H. Dudley, Berlin, Mass.
Charles H. Early, Hyde Park, Mass.
Scott Harrison Eaton, Lawrenceville, Ill.
Miss Phoebe Palmer Edwards, Brookline, Mass.
Vinal N. Edwards, Woods Hole, Mass.
Arthur S. Eldredge, South Lincoln, Mass.
Mrs. Mary L. Eliot, Needham, Mass.
Mrs. Mary Van Everen Ferguson, Providence, R. I.
Miss Mary B. Ferry, Norwalk, Conn.
L. H. Fingley, Providence, R. I.
Laurence B. Fletcher, Boston, Mass.
Alexander Forbes, Milton, Mass.
Dr. Augustus M. Ford, Providence, R. I.
Miss Fanny Ford, Mesilla Park, Agricultural College, New Mexico
Mrs. John R. Freeman, Providence, R. I.
N. W. Frasure, Lancaster, Ohio.
Ira N. Gabrielson, Marshalltown, Iowa.
Severin Gertken, Collegeville, Minn.
John T. Gibson, Southborough, Mass.
Mrs. John R. Gladding, Providence, R. I.
Alfred D. Gleason, Gleasondale, Mass.
W. Vernon Godshall, Río Piedras, Porto Rico.
Lewis S. Golsan, Antangaville, Ala.
Dr. Alfred M. Gould, Malden, Mass.
Miss Isa E. Gray, Boston, Mass.
Caroline S. Greene, Cambridge, Mass.
Herbert Spencer Grimes, Branchville, Conn.
Henry Rice Guild, Boston, Mass.
Mrs. Harriette L. Hemenway, Readville, Mass.
Alexander Henderson, Chestnut Hill, Mass.
Henry Charles Higgins, Uxbridge, Mass.
William H. Hill, Brookline, Mass.
Miss Julia R. Hotchkiss, New York City.
N. F. Lenssen, Englewood, N. J.
George Lyman Hinckley, Boston, Mass.
Henry Hersey Hinckley, Boston, Mass.
Florence A. Howe, Indianapolis, Ind.

J. C. Hvoslef, Lanesboro', Minn.
H. David Ives, Southampton, N. Y.
Ida G. Jenkins, Roxbury, Mass.
Charles W. Jenks, Bedford, Mass.
Jens Knudsen Jensen, Westwood, Mass.
Chas. Eugene Johnson, Minneapolis, Minn.
Prof. Morris Johnson, Valley City, No. Dak.
Lombard C. Jones, M. D., Falmouth, Mass.
F. W. Jones, Somerville, Mass.
Frank Louis Kemerling, Denver, Colo.
William Filmore Kendrick, Denver, Colo.
Allan Keniston, Edgartown, Mass.
Bernard W. King, New York City.
Charles R. Lamb, Cambridge, Mass.
J. Howard Leman, Boston, Mass.
Harrison F. Lewis, Yarmouth, Nova Scotia.
Mrs. Herman E. Lewis, Haverhill, Mass.
Prof. O. G. Libby, Fargo, North Dakota.
Stokley Ligon, Pecos, Reeves Co., Texas.
Dr. D. Moore Lindsay, Salt Lake City, Utah.
John William Linzee, Boston, Mass.
R. B. McLain, Wheeling, W. Va.
Mrs. Mary B. Luce, Boston, Mass.
Elias P. Mann, Williamstown, Mass.
Harold Lester Madison, Providence, R. I.
George Castor Martin, Frankford, Pa.
Ella M. Ormsby Marshall, New Salem, Mass.
Edwin Stuart Mattern, Allentown, Pa.
Walter I. Mattern, Allentown, Pa.
Miss Adelina May, Lynn, Mass.
Charles Johnson Maynard, West Newton, Mass.
Charles Johnson Means, Boston, Mass.
W. C. Mells, Columbus, Ohio.
John T. Mellus, Wellesley, Mass.
Albert Rowe Merrill, Hamilton, Mass.
Robert W. Metcalf, Springfield, Mass.
Leo E. Miller, New York City.
Harry Gilman Morse, Huron, Ohio.
Frank M. Phelps, Elyria, Ohio.
Miss Lillian P. Richards, Boston, Mass.
Alexander L. Moir, Lowell, Mass.
Miss Mary Mossman, Boston, Mass.
Mrs. H. S. Newell, Duluth, Minn.
Henry H. Simpson, Fanlew, Florida.
Donald J. Nicholson, Orlando, Florida.
Arthur A. Osborne, Peabody, Mass.

Samuel Copeland Palmer, Swarthmore, Pa.
 John E. Parsons, Lenox, Mass.
 Mrs. Cora E. Pease, Malden, Mass.
 Thomas E. Penard, Arlington, Mass.
 Miss Annie S. Penfield, Boston, Mass.
 Dr. George Henry Perkins, Burlington, Vt.
 Rev. Edward C. Porter, Boston, Mass.
 Julian K. Potter, Camden, N. J.
 Charles Lincoln Phillips, Taunton, Mass.
 Alfred E. Preble, North Abington, Mass.
 Roy Lee Primm, Madison, Wisc.
 Mrs. Henry H. Proctor, Boston, Mass.
 Thomas Emerson Proctor, Topsfield, Mass.
 Prof. Frederic Ward Putnam, Cambridge, Mass.
 Charles R. Ramsden, Guantanamo, Cuba.
 Charles Irving Rawson, Oxford, Mass.
 Paul M. Rea, Charleston, S. C.
 Samuel E. Beecher, Chester, Ill.
 Mrs. Ellen T. C. Rockwood, Worcester, Mass.
 Theodore Eric William Reynolds, Kent, Washington.
 Wyman Richardson, Boston, Mass.
 A. Lillian Rideout, Swampscott, Mass.
 A. A. Ringwalt, Fort Wayne, Ind.
 Clark L. Ring, Saginaw, Mich.
 Mrs. James W. Ripley, Malden, Mass.
 Charles Ripley, Dorchester, Mass.
 James O. Roberts, Utica, N. Y.
 Lucretius H. Ross, M. D., Bennington, Vt.
 Frederic Schenck, Cambridge, Mass.
 Prof. C. C. Schmidt, University, No. Dak.
 Jotham B. Sewell, Brookline, Mass.
 Charles Frederick Shaw, North Abington, Mass.
 H. A. Shaw, Fargo, No. Dak.
 Mary E. Shaw, Andover, Mass.
 Henry W. Shoemaker, Riverside, Conn.
 Henry H. Simpson, Fanlew, Florida.
 J. Holbrook Shaw, M. D., Plymouth, Mass.
 Mrs. Daniel D. Slade, Chestnut Hill, Mass.
 Gilbert M. Stark, Saginaw, West Side, Mich.
 Frank Everden Stevens, Somerville, Mass.
 Herbert Lee Stoddard, Milwaukee, Wisc.
 Allan James Stover, Corvallis, Oregon.
 Francis A. Strater, Brookline, Mass.
 John N. Summers, Melrose Highlands, Mass.
 M. W. Tanner, Saginaw, West Side, Mich.
 Henry Thurston, Floral Park, N. Y.

Franklin Tomlinson, Shelton, Conn.
Mrs. Helen M. Tower, Cambridge, Mass.
Harry Trippet, Montclair, N. J.
John G. Tyler, Fresno, Calif.
Windsor M. Tyler, M. D., Lexington, Mass.
Prof. J. William Votey, Burlington, Vt.
Henderson Wallace, Washington, Iowa.
Annie L. Warner, Salem, Mass.
Mrs. Elizabeth W. Waite, Cambridge, Mass.
Mrs. Mary Clark Waite, Medford, Mass.
Mrs. W. G. Webber, Bedford, Mass.
Harvey Wheeler, Concord, Mass.
Myron L. Whitcomb, Haverhill, Mass.
Dr. David Day Whitney, Middletown, Conn.
H. V. Williams, Agricultural College, No. Dak.
George Willett, Los Angeles, Calif.
Arthur Melvin Winslow, Worcester, Mass.

Drs. Allen, Dwight, Merriam and Richmond, and Messrs. Brewster, Ridgway and Stone were re-appointed 'Committee on Classification and Nomenclature of North American Birds.'

Dr. A. K. Fisher, E. W. Nelson and Dr. Chas. W. Richmond were re-appointed 'Committee on Bird Protection.'

It was voted to publish an additional Index to 'The Auk' covering the years 1901 to 1910, inclusive.

The following amendments to the By-Laws, proposed at the last Stated Meeting of the Union, were adopted. Article IV, Section 5, now reads:

"Elections to the classes of Fellows and Members shall be held in the following manner: The number to be elected shall be first decided by a majority vote of the Fellows present at the Stated Meeting at which the election is to be held, but not more than five Fellows nor more than five Members shall be elected in any one year.

At each ballot each Fellow present may vote for nominees not exceeding the full number of vacancies to be filled, and the person receiving the highest number of votes shall be declared elected, provided that he receive the votes of at least three-fourths of the Fellows present, and so on until the vacancies are filled. Any candidate who, in each of ten successive ballots, fails to receive the votes of half of the Fellows present, shall cease to be a candidate during the remainder of the Stated Meeting.

The election of either Fellows or Members may be suspended at any time by a majority vote of the Fellows present.

During election a discussion of the merits of nominees will be in order."

Article V, Section 1, now reads:

"The annual dues shall be for Fellows five dollars, for Members four, and for Associates three dollars. No dues shall be required of Retired, Honorary or Corresponding Fellows."

Section 6 of Article IV was eliminated.

PUBLIC SESSIONS. *First Day.* The meeting was called to order by the President, Mr. Chapman.

The papers read during the morning session were as follows:

'Some Labrador Notes' by Dr. Charles W. Townsend.

'The Red-winged Blackbird: A Study in the Ecology of a Cattail Marsh,' by Arthur A. Allen. Illustrated by lantern slides. Remarks followed by Mr. Nichols, Prof. Barrows, Mrs. Chapman, and the author.

'On the Present Status of the Bobolink, or Rice-bird, in the South,' by Edward Howe Forbush. Remarks followed by Dr. Bishop, Mr. Francis, Prof. Pearson, and the Chair.

'Queer Nesting Sites of the House Wren,' by Wilbur F. Smith. Illustrated by lantern slides.

'A new Subspecies of Crossbill from Newfoundland,' by A. C. Bent. Illustrated with specimens.

'Notes from Northern Labrador,' by A. C. Bent. Remarks followed by Messrs. Murdoch, Arnold, Pearson, and the author.

'The Nest Life of the Sparrow Hawk,' by Miss Althea R. Sherman. Remarks followed by Mr. Bowdish.

The first paper of the afternoon was:

'Informal Notes on the Work of the Field Museum in South America,' by W. H. Osgood.

The remaining papers, both illustrated by lantern slides, were:

'Further Observations on Colombian Bird Life,' by Frank M. Chapman.

'Propagation and Restoration of American Wildfowl,' by Herbert K. Job.

Immediately after adjournment an informal reception was tendered the members of the Union and their friends, by Mr. and Mrs. Charles F. Batchelder at their home on Kirkland Street.

In the evening the men of the Union were invited by Mr. Brewster to a reception at his Museum.

Second Day. The meeting was called to order by President Chapman.

The papers of the morning session were:

'The A. O. U. Check-List,' by Dr. Louis B. Bishop. Remarks followed by the Chair.

'Notes on the Panama Thrush-Warbler,' by Prof. Hubert Lyman Clark.

'Report of Progress on the 'Life Histories of North American Birds,' by A. C. Bent. Remarks followed by Mr. Cleaves, and the author.

'Some Notes from Sheepshead Bay and Manhattan Beach, New York City,' by George E. Hix. Remarks followed by Messrs. Smith, Cleaves, Bowdish, Fuertes, and the author.

'Concealing Action of the Bittern,' by Prof. Walter B. Barrows. Remarks followed by Messrs. Allen, Brewster, Arnold, Francis, Cleaves, Fuertes, Bowdish, Osgood, Peters, and Dr. Wright, Profs. Tuttle and Jones, and the author.

The following papers, all illustrated by lantern slides, were presented at the afternoon session:

'What the American Bird Banding Association has accomplished the Past Year,' by Howard H. Cleaves. Remarks followed by Messrs. Grant, Bowdish, Nichols, Bent, Baynes, and the author.

'A Biological Reconnaissance of the Okefinokee Swamp: The Birds,' by Dr. Albert H. Wright and Francis Harper. Presented by Dr. Wright.

'Notes on the Migration and Habits of some Long Island Shore Birds,' by Francis Harper, and John Treadwell Nichols. Presented by Mr. Nichols.

In the evening the members of the Union, and their friends, met at dinner at Mifflin Hall, Brattle Square. After the dinner an informal reception was held.

Third Day. The meeting was called to order by President Chapman. The papers of the session were:

'The Flight of Birds,' by Alexander Forbes. Remarks followed by Messrs. Bigelow, Brewster, Nichols, Fuertes, Grant, Batchelder, Pennock, and Webster, Prof. Barrows, Drs. Townsend and Elliot, and the author.

'A Glimpse at the Home Life of *Larus marinus*,' by Howard H. Cleaves. Illustrated by lantern slides.

'The Present Status of the Heath Hen,' by Dr. George W. Field. Illustrated by lantern slides, and a living specimen. Remarks followed by Messrs. Bigelow, Forbush, the Chair, and the author.

The following papers, in the absence of their authors, were read by title:

'Notes on the present Breeding Range of White Egrets in the United States,' by Prof. T. Gilbert Pearson.

'Passenger Pigeon: Report of the Year's Work,' by Prof. C. F. Hodge.

'Problem of Domesticating the Ruby-throated Hummingbird,' by Miss Katharine E. Dolbear.

'The Value of Bird Study in a Limited Area,' by Mrs. Alice Hall Walter.

'Two Flycatchers of the Genus *Empidonax* new to the Fauna of South Carolina,' by Arthur T. Wayne.

'Eighteen Species of Birds New to the Pribilof Islands, including Four New to North America,' by Dr. Barton W. Evermann.

'A Study of the House Finch,' by Dr. W. H. Bergtold.

'The Status of the Extinct *Meleagridæ*,' by Dr. R. W. Shufeldt.

Resolutions were adopted thanking the Museum authorities of Harvard University for the use of the Lecture-rooms; to the Nuttall Ornithological Club for the very cordial welcome and most generous hospitality extended to the visiting members and friends of the Union; to Mr. and Mrs. Charles F. Batchelder, and Mr. and Mrs. William Brewster, for the kind attentions shown the members and friends of the Union, and to Col. and Mrs. John E. Thayer for the polite invitation to the members of the Union to visit their home and Museum at Lancaster, Mass.

Thursday afternoon, November 14th, Mr. William Brewster gave the ladies of the Union an opportunity to see his collection of birds at his Museum on Riedesel Avenue.

On Friday, November 15th, after adjournment of the Union, some seventy members and friends of the Union visited Lancaster, Mass. The party was most cordially received by Col. and Mrs. John E. Thayer, and several pleasant hours were spent in an inspection of their fine museum and valuable ornithological library.

The registered attendance of members at the Stated Meeting just closed was larger than ever before, and the number of new

members elected exceeded anything in the history of the Union, due in a great measure to the active interest of one Fellow. The social features at Cambridge will long be remembered.

The next meeting of the Union will be held in New York City, the date to be determined later.

JOHN H. SAGE,
Secretary.

GENERAL NOTES.

Sabine's Gull in Massachusetts.— On September 2, 1912, two Sabine's Gulls (*Xema sabini*) were taken at Chatham, Massachusetts, and sent to me in the flesh. Both were males in adult winter plumage and the skins are now in my collection. This is, I believe, the fourth record of the occurrence of this species in the state.— F. SEYMOUR HERSEY, *Taunton, Mass.*

Another Bridled Tern for South Carolina.— During the early part of September, 1912, a specimen of Bridled Tern (*Sterna anatheta*) flew into the ventilator of the Ocean Steamship, City of Memphis, while en route to Savannah. The Tern was caught and brought to Savannah and presented to Mr. Troup D. Perry, and is now in his collection; it was an adult bird in fine plumage.— G. R. ROSSIGNOL, JR., *Savannah, Ga.*

Caspian Tern in Chester Co., Pennsylvania.— Two Caspian Terns, (*Sterna caspia*) were shot at Lenape Park, on the Brandywine, near West Chester, on September 28, 1912, and were taken to the Philadelphia Academy of Natural Sciences for identification. One had the black summer crown, and the other the gray one of winter, or immature plumage. The two birds were together and no others were with them. They were a female and young male and were doubtless blown inland by the three days easterly storm which prevailed at the time. This I believe is the first record of this bird for Chester County. I have heard of no one having seen them previous to the time they were collected.— ROBERT P. SHARPLES, *West Chester, Pa.*

Fulmar in Massachusetts.— On September 23, 1912, Mr. Daniel E. Harrington picked up on the beach at Mononoy Point, Chatham, a fine adult specimen of Fulmar (*Fulmarus glacialis glacialis*) and brought it to me for identification. It was perfectly fresh and in perfect condition, it has been mounted and is now in Mr. Harrington's possession.— C. EMERSON BROWN, *Boston, Mass.*

White Pelican at Savannah, Georgia.— I am glad to report the capture of a White Pelican (*Pelecanus erythrorhynchos*), that was shot at the wharves in the Savannah River, the date of capture was October 9, 1912, the specimen is now in the hands of a taxidermist and is the property of Mr. Cord Asendorf, Jr.— G. R. ROSSIGNOL, Jr., *Savannah, Ga.*

The Black Duck Controversy Again.— During the last two years, 1911 and 1912, I have been much interested in a pair of wild Black Ducks, apparently adult birds, that nested near a shallow pond back in the woods at my place, Newton Centre, Mass. In 1911 they raised a brood of ten young flappers, and while in 1912 they again nested there, I am unable to say what became of the young, as I was forced to let the water out of the pond before the time of their hatching. The old birds from their habits were very apparently the same pair that returned each spring, and they were of the so-called green-legged kind.

While at Monomoy Island, Mass., during the last two weeks of October, 1912, with a couple of friends, we shot a number of Black Duck of the red-legged kind (there were no green legs), among which were several that were apparently young birds; and on October 25 there fell to one of our guns a female, which from its size, plumage, and general characteristics, was so evidently young that there could be no possible doubt about it. I personally skinned and sexed this specimen, which showed its immaturity in all those ways familiar to those who handle birds. It must have been one of a very late brood, for its upper mandible was a steel gray, and had not yet begun to show those shades of light olive green of the adult bird, and the 'nail' at the end of the upper mandible was hardly darker than the rest of the bill, and nothing like the dark and glossy black of the adult bird. The lower mandible was pinkish and still quite soft and pliable, as in the case of very young ducks, and *the bird had red legs.*

Let us hope that this is the final nail in the coffin of the Black Duck controversy, and that it may hold so securely that even Dr. Dwight may not again resurrect the corpse in some post-mortem or pre-cherubic plumage.— F. H. KENNARD, *Boston, Mass.*

The Harlequin Duck in Wyoming.— On September 15, 1912, while stopping at Moran post office near the north end of Jackson Hole, Wyoming, I noticed two flat skins of the Harlequin Duck (*Histrionicus histrionicus*) hung in the dining room of Teton Lodge. The proprietor of the Lodge, Mr. B. D. Sheffield, informed me that these birds had been shot in the vicinity, on Jackson Lake, in May about four years ago, probably in 1908. Both specimens were males in full plumage.

This species is not included in Knight's 'Birds of Wyoming,' but Prof. W. W. Cooke has kindly called my attention to a record in Coues' 'Birds of the Northwest,' p. 579, of a pair of these ducks collected by Prof. F. V. Hayden, May 31, 1860, on 'Mount. Stream.' The female contained an egg nearly ready to be laid. Examination of the records of other specimens in

the same collection shows that this 'Mountain Stream' was in the Wind River Mountains near the head waters of the Gros Ventre River east of Jackson Hole. Both of the Hayden specimens are now in the U. S. National Museum.

The Harlequin Duck has long been known to breed sparingly in the Rocky Mountains in Montana and Colorado. In 1874 Coues¹ found young in August, unable to fly, on the streams which flow into Chief Mountain Lake, Montana, and two adult females collected by the expedition at this locality on August 22 are in the National Museum. In 1881 Dr. Merrill² found several pairs breeding near Fort Custer almost exactly on the Montana-Wyoming boundary, although he failed to discover their nests. The notes of the Biological Survey contain records of a flock of eight or ten seen on St. Mary Lake by Vernon Bailey and A. H. Howell in May, 1895, and of a female seen by the same observers June 19, 1895, at Java, on the line of the Great Northern Railway between Belton and Summit in Flathead County.

In Colorado Carter³ collected eggs June 3, 1877, in Middle Park and also found the bird breeding in the same general region in Summit County, on Blue River just below Breckenridge, at an altitude of 9,200 feet.⁴ In 1881 Drew⁵ recorded it as common in San Juan County, where it was said to breed. Morrison⁶ reported in 1888 that he had often seen it through the winter at Fort Lewis on the Ute reservation and believed that it bred both in San Juan and La Plata counties.

The bird is evidently a rare breeder in the Rocky Mountains south to latitude 37, but the only records seem to be those in 1860, 1874, 1877, 1881, about 1888, 1895 and 1908. It is interesting to note that the records show that it breeds in Wyoming as well as in Montana and Colorado. The first specimens collected half a century ago and so long overlooked were in reality from Wyoming and the two records from that State are both from the Jackson Hole region, one at the north end and the other in the mountains east of the valley.—T. S. PALMER, *Washington, D. C.*

The King Eider (*Somateria spectabilis*) in Massachusetts.—Four years ago I had, for the first time, the pleasure of seeing this boreal species alive, and of closely examining in the flesh a male in nearly full plumage. It seemed to me then, as at present, the most beautiful of the Fuliginæ of North America. I became interested in its past and present status in Massachusetts, and made some investigations, the results of which are appended.

¹ 'Birds of the Northwest,' p. 579, 1874.

² Orn. and Ool., VI, p. 44, 1881.

³ Allen, Bull. Nutt. Orn. Club, IV, p. 50, 1879.

⁴ Cooke, 'Birds of Colorado,' Bull. 56, Agri. Exp. Sta. Colo., p. 195, 1900.

⁵ Bull. Nutt. Orn. Club, VI, p. 142, 1881.

⁶ Orn. and Ool., XIII, p. 165, 1888.

The earliest writers refer to the species as rare or very rare in Massachusetts. Alexander Wilson, according to Bonaparte was not even aware that it was a member of the North American fauna. Audubon speaks of its rare occurrence in the vicinity of the 'Bay of Boston,' and further states that "I have, however been assured by old and trustworthy gunners that the King Duck, about thirty years ago, was by no means of rare occurrence there during winter." Curiously enough I also have received the same sort of information within a year from the same type of observer. It is marvelous how many statements get into literature from fishermen, etc., a type that in my experience has proved to be exceedingly unreliable as a rule. I am aware of one market gunner dwelling on the Atlantic seaboard who is exceedingly dishonest in most of his dealings with men, yet many of his statements have worked their way verbatim into American ornithology. The query naturally suggests itself: Will a man of naturally dishonest propensities in the pursuit of a livelihood, furnish ornithological data fit to be handed down to posterity?

The King Eider, as we know it, is apparently during the winter an 'off-shore' bird, and its previous reported occurrence near the coast would indicate a change in habits. Mr. A. H. Norton (Auk, Vol. XVII, No. 1, Jan., 1900, p. 18) states that *Somateria spectabilis* feeds largely on Holothurians (*Pentacta frondosa*), hence their feeding in deeper water than *dresseri* which as far as I know, prefers in our waters, the common mussel (*Mytilus edulis* Linné) and perhaps *Modiolus modiolus* (Linné). On the other hand two King Eiders shot at Long Island on three to four fathoms of water were said by Mr. William Dutcher to be gorged with *Mytilus edulis* (Auk, Vol. V, No. 2, April, 1888, p. 174). If at former times they were near the coast it is reasonable to believe that they might have fed on *Mytilus edulis*, which is now and undoubtedly has been, abundant along our shore. That they were driven off shore before Audubon's time by the persecution of man seems unreasonable, for I am assured by a friend who has killed many Eiders in the far north that they exhibit no more fear than the other Eiders which are notably fearless. Mr. A. C. Bent of Taunton tells me that the gunners at Westport, Mass., state that these birds are common in that vicinity during winter, frequenting the outer rocky islands and reefs. 'Common' seems a strong statement, but the fact that eight were killed in one day would lead one to believe that they may be 'not rare.' They apparently know the King from the American Eider as they refer to the former as 'Cousins' and the latter as 'Wamps.' The species is undoubtedly more common than present literature and accurate observations would indicate, as systematic offshore work is a difficult problem for most ornithologists. Until further investigations are made however, it must be considered a very rare visitant in Massachusetts.

The majority of the specimens taken have been shot during the fall, but this, I think, is not due to the migration routes or periods, but to the fact that they were procured largely by gunners engaged in 'cooting,' a sport that in most localities where Scoters did not 'bed,' ceased by the first.

of December. The spring flight of Scoters would bring the sportsmen out too late for King Eiders as the latter go north very early, even leaving southern Greenland late in April (W. W. Cooke, Bull. 26. Biol. Survey, p. 59.)

The fact that most of the specimens noted in Massachusetts have been juvenal males and females is no doubt due to the fact that the adult males do not migrate so far south as the females and young, a phenomenon noted in other species of birds.

The following records are all that have come to my notice, and I am greatly indebted to those who have kindly furnished me with such records as have not been previously published.

Adult male in the collection of the Boston Society of Natural History taken by Dr. Samuel Cabot, Jr., and labelled 'Massachusetts.' This bird was probably taken some sixty years ago at least.

Female ditto.

Juvenal male taken Nov. 6, 1871, at Cohasset. Now in collection of Mr. William Brewster.

Juvenal male taken during Nov., 1871. Exact locality not known. Collection of Mr. William Brewster.

Female taken Dec. 1, 1875. No exact locality. Collection of Mr. William Brewster.

Male shot at Chelsea on Jan. 6, 1875. Collection of Mr. William Brewster.

Female taken during Jan., 1875 at Chelsea. Collection of Mr. William Brewster.

Female shot by Mr. W. S. Bryant at Cohasset, Nov. 1, 1885. This specimen is now in the collection of the Museum of Comparative Zoölogy at Cambridge, Mass.

Adult male taken during the autumn of 1888 at Manomet, South Plymouth. It was alone in the cove just south of Manomet Point. (H. K. Job, Auk, Vol. XIII, No. 3, July, 1896, p. 203.)

Unsexed specimen taken at Marblehead, Nov. 24, 1889. Now in the collection of the Peabody Academy of Science at Salem. (Birds of Essex County, C. W. Townsend, p. 142.)

Juvenal male shot at Salisbury by Mr. Benj. F. Damsell on Nov. 24, 1889. (MSS. of Dr. G. M. Allen.)

The species was observed at Wood's Hole, April 10, 1893, by Capt. V. N. Edwards. (Prof. W. W. Cooke in litt.)

Juvenal male taken at Muskeget Island, April 5, 1890. (Ornith. & Ool, Vol. 15, No. 7, July, 1890, p. 110.)

Juvenal male taken at Nantucket, Jan. 15, 1891. Collection of Mr. William Brewster.

The species observed at Wood's Hole on April 10 and Nov. 16, 1893, by Capt. V. N. Edwards. (Prof. W. W. Cooke in litt.)

Two females shot on Lower Mystic Pond, Arlington on Dec. 4, 1893, by Mr. Geo. B. Frazar. (Birds of the Cambridge Region, William Brewster, p. 122.)

The species noted by Capt. V. N. Edwards at Wood's Hole on April 10 and Nov. 11, 1894. (Prof. W. W. Cooke in litt.)

Adult male taken Nov. 15, 1895, at Manomet Point. (H. K. Job, Auk, Vol. 13, No. 3, July, 1896, p. 203.)

Juvenal male taken at Nippenicket Pond, Bridgewater on Oct. 21, 1899, by Mr. Joseph E. Bassett. According to Mr. Bassett's journal there was a northeast storm on the 20th shifting to a cold N. W. gale on the 21st. The specimen is now in the collection of Mr. Arthur C. Dyke of Bridgewater from whom I learned these details though the capture of the bird has been recorded. (A. C. Bent, Auk, Vol. XIX, No. 2, April, 1902, p. 196.)

Female taken at Monomoy, April 8, 1905, by Mr. C. Otto Zerrahn of Milton, and now in his collection. It was in a flock of about ten American Eiders.

Male in nearly full plumage taken by a gunner at Manomet Point, Nov. 26, 1908, and now in my collection. It was in company with two females or juvenal males of apparently the same species for they passed near enough to me to note that they seemed more stockily built and had shorter heads than the American Eider with which I am familiar.

Four juvenal males and 4 females shot on Feb. 3, 1909, near the Hen and Chicken reef off Westport. Four of these are in the collection of Mr. A. C. Bent of Taunton, and the rest in the collection of the Bristol County Academy of Sciences at Taunton. (Mr. A. C. Bent in litt.)

Two specimens taken at Martha's Vineyard on Nov. 17, 1911. There were four birds in the flock. These specimens were sent to Mr. Owen Durfee of Fall River.—W. SPRAGUE BROOKS, *Milton, Mass.*

Brazilian Tree-duck (*Dendrocygna viduata*) in New Jersey.—Early last October I learned of the receipt, by Thomas Rowland, taxidermist, of New York, of an unrecognized Duck, reported to have been killed in New Jersey and sent to the taxidermist for preservation. The specimen is a Brazilian Tree-duck killed on the Hackensack Meadows in New Jersey, by Hon. John W. Griggs, of Paterson, N. J.

Governor Griggs was returning down the Hackensack River from a shooting excursion, when he saw this Duck resting on a drift log at a place where the tide overflowed the meadow, about a mile and a half above the village of Hackensack. As the bird was at once seen to be unusual, Governor Griggs shot it. It was not at all shy.

The specimen showed no signs of ever having been in captivity, but in any event its occurrence at liberty in New Jersey seems worth recording.—GEORGE BIRD GRINNELL, *New York City.*

An Addition to the A. O. U. Check-List.—Through the kindness of Mr. Gardner Perry of Dedham, Mass., I am able to record the following interesting capture.

In March, 1912, while shooting at Cape Canaveral, Florida, Mr. Perry secured a Bahama Duck (*Pæcilonetta bahamensis* (Linn.)). Unfortunately

the specimen was not sexed though its coloring and size would favor its being a female. The bird was in company with a small flock of Green-winged Teal, and the wind at the time was southeast. It seems a strange fact that this bird has not been recorded from Florida before, a region that has so long received the attentions of sportsmen and naturalists.

Mr. Perry has generously presented this specimen to the Museum of Comparative Zoölogy at Cambridge.— W. SPRAGUE BROOKS, *Milton, Mass.*

Little Blue Heron (*Florida cærulæa*) **in Vermont.**— While on Montebello Hill, Newbury, Vt., on August 16, 1912, between 5 and 6.30 p. m., I was looking down upon a swampy meadow which lies below and in which the Bittern makes its home, and saw something unusual moving about. Using my field glasses I saw that it was a white heron wading slowly in the water. It was not so large as the Great Blue Heron with which I was familiar and was pure white except the tips of the wings which were a soft gray—evidently the Little Blue Heron in immature plumage. I could not see the legs as the water came nearly up to the body.

It moved very slowly and deliberately feeding among the plants which grew in the water. I watched it for half an hour or more until it passed out of sight around a curve. It made no call of any kind.— ANNA E. COBB, *Providence, R. I.*

Swimming of Young Herons.— In his excellent article, 'Bird Genealogy,' (*Auk*, XXIX, 1912, pp. 285-295), Dr. Charles W. Townsend speaks of the ease and grace in swimming shown by a young Green Heron when placed in the water. It may be of interest to note that young herons of several species sometimes take to the water voluntarily. On a trip to the breeding island of Snowy Herons near Charleston, S. C., on July 4, 1912, I found most of the young of all of the five species of herons which breed there well able to fly. Many, however, could only scramble about in the branches of their nesting trees or fly short distances to keep out of my way as I passed. As I walked around to the windward side of the island, driving numbers of young herons before me, I saw a young Louisiana Heron, which had flown a few yards up the wind, resting quietly on the water. I thought it had fallen there, and was surprised to see that it was swimming with truly swanlike grace. While I watched, about a dozen others—Louisianas, Little Blues, and, I think, one or two Snowies—flew out from shore and deliberately alighted on the water. I waited for some minutes to see how they would make back to land, and soon found that, after a short rest, they could rise with ease from the surface of the water and fly back to the trees on shore.— FRANCIS M. WESTON, JR., *Charleston, S. C.*

Northern Phalarope (*Lobipes lobatus*) **in Michigan.**— The status of this Phalarope as a Michigan species has been somewhat in doubt. Prof. Barrows states (*Mich. Bird Life*, 1912, 166), "I do not know of an actual Michigan specimen preserved anywhere." I can add one unimpeachable record—there is a female in the U. S. National Museum, No. 170,517,

taken on September 14, 1899, in Lenawee County by Dr. C. M. Butler that I examined last winter. In the University of Michigan Museum there is a mounted bird, an adult female labeled 'Michigan,' No. 1172a. A search in the original catalogue reveals no further data but I am inclined to believe that this specimen came from Mr. Jas. Hobson, at one time taxidermist at the Museum in the late seventies. Mr. Hobson did considerable collecting at the St. Clair Flats, and the bird may have been secured there.

Mr. W. E. Saunders of London, Ont., has two specimens taken at Rondeau, Lake Erie, by Mr. Phillip Burk and sent to him—one secured on October 10, 1906, and a female on October 20, 1906.—B. H. SWALES, *University of Michigan Museum*.

Black Vulture in Vermont.—On July 7, 1912, a Black Vulture (*Catharista urubu*) was shot in Pawlet, Vt., a town adjoining this but just across the New York line. It was brought to me for identification and is being mounted by a local taxidermist. It seemed to be an old bird in fine plumage and the wonder is that it should be taken several hundred miles north of its summer home.—F. T. PEMBER, *Granville, N. Y.*

The Swallow-tailed Kite in DeWitt Co., Illinois.—Early in June, 1906, I observed a bird of this species circling about over the open hills along Salt Creek, about 5 miles southeast of Clinton. The bird was perfectly unconcerned by my presence, and continued its soaring flight within easy gun range, making its identification a certainty.—EDWIN D. HULL, *Chicago, Ill.*

The Alder Flycatcher in Colorado.—I beg to record two specimens of the Alder Flycatcher (*Empidonax trailli alborum*), for Colorado. They constitute the second and third records for the state, the first being a specimen taken by C. E. Aiken, near Limon, Colorado, May 27, 1905.¹ The identification of my birds as of Aiken's is by H. C. Oberholser of the Biological Survey. The first is an adult bird taken in the Clear Creek valley, west of Denver, June 4, 1911, and the second an immature male taken in same locality August 6, 1911. The dates of collection somewhat suggest breeding birds and it is by no means unlikely, that we may be able to add this species to our list of summer residents. Both of the above specimens are now in my collection.—F. C. LINCOLN, *Colorado Museum of Natural History, Denver, Colo.*

Arkansas Kingbird in Massachusetts.—On October 20, 1912, at Monomoy Island, Chatham, Mass., and just off the heel of Cape Cod, I shot an immature male Arkansas Kingbird (*Tyrannus verticalis*). The bird was flitting about some clumps of bayberry bushes, among the sand dunes near our club house, and first attracted the attention of our club attendant by its bright yellow belly.

¹ A History of the Birds of Colo., by W. L. Sclater, p. 275.

I was unable to get near enough to the bird to examine it closely, for while by its actions evidently lost and confused, it was still shy, and I shot it on the supposition that it would prove to be in all probability a stray Crested Flycatcher. This species has been but seldom seen east of the Mississippi River; being, I believe, reported in Wisconsin, New York, New Jersey, and Maryland, and once only in New England, a specimen having been shot at Elliot, Maine, in October, 1865, by Mr. George E. Brown, as reported by Henry A. Purdie in the 'Bulletin of the Nuttall Ornithological Club' Vol. 1, no. 3, p. 73.—F. H. KENNARD, *Boston, Mass.*

Yellow-headed Blackbird in Virginia.—On August 29, 1912, about 6 A. M., Capt. Wm. T. Abbott, of Chincoteague, Accomac Co., Va., saw two Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*), male and female, in some willow trees along the margin of a fresh water pond on Wallop's Island. The birds were unknown to him and he shot one, the female, which he presented to me. The place where he found these birds was near his truck patch, where there are scattered pine trees and many wax myrtle bushes about marshy spots and fresh water ponds. In this same locality the Boat-tailed Grackles were numerous, and I also saw several Red-winged Blackbirds there.

The male Yellow-headed Blackbird remained about the place for several days, as Capt. Abbott saw him on two occasions before I left on the 9th of September.

The stomach of the female was sent to the Biological Survey, Washington, D. C.—B. H. WARREN, *Everhart Museum, Scranton, Pa.*

The Slate-colored Fox Sparrow Breeding in Colorado.—Records of this bird (*Passerella iliaca schistacea*) for Colorado are not plentiful and its whole status is rather unsatisfactory; no doubt due to some extent to its retiring habits and preference for dense and practically impenetrable willow and alder thickets. It was formerly supposed that the type specimen was collected in Colorado, but this was found to be an error.¹ Mr. Ridgway¹ states that it breeds in Colorado along 'streams of the mountain parks'; and for some time this constituted the only record. Since then a number of specimens have been taken, most of them recorded as follows:—"an adult male taken July, 1889, at Florissant, by Dr. J. L. Goodale," "Mr. David Bruce of Brockport, N. Y., took one on the Grand River near Glenwood Springs during June, 1897."² This bird was seen several times and was thought to be breeding. There was also a mounted specimen in the "Carter collection taken near the mouth of the Blue River in Grand County, July 5, 1877, at nearly 7000 feet."³

These records, together with an unrecorded pair from the Carter Col-

¹ Birds of Colorado, Part I, W. W. Cooke, p. 107.

² Birds of Colorado, Part II, W. W. Cooke, p. 167.

³ Birds of Colorado, Part III, W. W. Cooke, p. 216.

lection, now in the Colorado Museum of Natural History, taken near Breckenridge, July 5 and 9, 1877; and one taken in Deer Park, Routt County, April 18, 1911, by Dr. L. J. Hersey, confirm to a great degree this bird's residency in Colorado during its breeding period.

It was, however, the pleasure of the author to remove any existing doubt by collecting an adult female with one fledgling, June 24, 1912, on the Grand River, in Grand County, at an elevation slightly over 8000 feet. The fledgling had unquestionably been raised in the immediate vicinity as it was just able to support itself for short flights. I believe this is also the highest altitude from which it has yet been taken. This will undoubtedly supply the evidence Mr. Selater required to include it in his list of Colorado breeding birds and save straining the point Prof. Cooke mentions in 'The Condor.'¹—F. C. LINCOLN, *Colorado Museum of Natural History, Denver, Colo.*

Harris's Sparrow in Eastern Ontario.—It gives me pleasure to record the capture of the first specimen of Harris's Sparrow (*Zonotrichia querula*) for eastern Ontario. The bird was taken from a mixed flock of Song Sparrows and Juncos which were feeding in a garden on the outskirts of London, Ont., about eight A. M., March 18, 1907.

My attention was attracted by a single long drawn note of the same pitch and quality as that of the White-throated Sparrow and on searching through the flock I found this large dark-colored bird which was very soon secured. It is a male in immature plumage spotted irregularly on the upper breast giving a hint of the black coloration which was to come. The specimen is now number 1797 in my collection.

This species has occurred in Ohio and a number of times in Michigan but has not previously been captured in lower Ontario although it is probable that it is a regular migrant through the northwestern corner of the province.—W. E. SAUNDERS, *London, Ont.*

Magnolia Warbler in the Coast Region of South Carolina.—On October 1, 1912, I saw and positively identified a female Magnolia Warbler (*Dendroica magnolia*) at the Navy Yard near Charleston, S. C. It was feeding in the undergrowth in pine woods, and I was able to examine it carefully at short range with my glasses. While this Warbler is an abundant migrant in the upper counties— one hundred and fifty miles and more from the coast— this is, to my knowledge, only the second record of its occurrence in this region. As the specimen was not secured, this record has perhaps no scientific value; and I am noting it simply as a matter of interest.—FRANCIS M. WESTON, JR., *Charleston, S. C.*

A Few Notes on Newfoundland Birds.—The following notes may be of interest as supplementing Mr. Arnold's paper (Auk, Jan., 1912, pp.

¹ Present Status of the Colorado Check-List of Birds. W. W. Cooke, Condor, XIV, No. 4, 153.

72-79). I arrived in Newfoundland at Port aux Basque on July 7, 1911, and proceeded at once to Steenville Crossing on St. George's Bay. Here I remained one week returning to Cape Breton Island on July 14. Though my interests were mainly botanical, I made notes and observations on all the birds that came directly under my notice of which the following seem worthy of note. I was particularly anxious to study the Veery, its habits and notes, since I described it as a variety in 'The Auk' (Vol. XVII, 270, 271, 1900), based on material collected in this portion of the island.

My friend, Dr. Geo. C. Shattuck of Boston has also lately given me some notes made on the Humber River between September 13 and October 4, 1912.

Mergus americanus. AMERICAN MERGANSER.—Two seen by Dr. Shattuck.

Histrionicus histrionicus. HARLEQUIN DUCK.—Dr. Shattuck was told that this species breeds regularly on the Bay of Islands.

Botaurus lentiginosus. AMERICAN BITTERN.—One seen by Dr. Shattuck.

Ardea herodias herodias. GREAT BLUE HERON.—One seen by Dr. Shattuck.

Philohela minor. WOODCOCK.—A young chick, I think undoubtedly of this species, was closely observed running on a swamp and tree grown wood road near Indian Head on the 12th. It took at once to the underbrush, and from the locality, position of its eye, etc., I felt little doubt of its proper identification.

Egialitis meloda. PIPING PLOVER.—A pair was seen continually on the beach at the Crossing. Though I did not find their nest, they were evidently breeding and showed much anxiety at my presence when I crossed a certain portion of the beach. I believe this species has not been reported except as a migrant from this island.

Sphyrapicus varius varius. SAPSUCKER.—One seen by Dr. Shattuck.

Hylodichla fuscescens fuscescens. WILSON'S THRUSH.—Though it is not my desire to question the ruling of the American Ornithologists' Union, yet the long sought opportunity to hear the bird inhabiting Newfoundland has at last been gratified, and I am more strongly convinced than ever that my *fuliginosa* is distinct. Its darker coloring leads one at sight to confuse it with the Olive-back, and I had to shoot the bird in one case to be positive of my identification. Its call note *pheu* has what seems to me quite a different quality, and its song, if my birds were not peculiar, instead of being an uninterrupted performance is divided into three distinct parts, and unlike any Veery song I have ever heard in New England. I listened to several birds singing near the mouth of Harry's Brook, and I believe the difference would be noted by any one familiar with the stereotyped song.—R. HEBER HOWE, JR., *Thoreau Museum, Concord, Mass.*

Additional Notes to the 'Birds of Gallatin County, Montana'.—

These notes form an appendix to my paper published in 'The Auk,' January, 1911, pp. 26-49. The numbers are those of my list.

37. **Gallinago delicata.** WILSON'S SNIPE.— This species appears to be fairly common and regular as a winter resident in warm swamps near Bozeman. I observed seven birds on December 26, 1911.

43. **Catoptrophorus semipalmatus inornatus.** WESTERN WILLET.— Mr. W. L. Thomas of Belgrade found two nests of this species during the summer of 1911.

120. **Hesperiphona vespertina montana.** WESTERN EVENING GROSBEAK.— I observed a small flock in Bozeman on January 2, 1911. The species is evidently occasionally a winter resident, though much commoner as a migrant.

126. **Leucosticte tephrocotis littoralis.** HEPBURN'S ROSY FINCH.— I observed this subspecies in company with *L. t. tephrocotis* in Bridger Cañon, March 17, 1911. Large flocks were seen and about 10 percent. of the birds were of this form.

170. **Vermivora celata lutescens.** LUTESCENT WARBLER.— I observed a male of this species in song, in an aspen grove near Bozeman, July 4, 1910. It probably breeds in the region and the breeding bird is probably *V. c. celata*, but it was neither secured nor observed closely.

199. **Cyanocephalus cyanocephalus.** PIÑON JAY.— A flock of about 40 birds was observed flying over the western part of Bozeman on Sept. 11, 1911. This adds a new species to the county list, and to my knowledge, is the most westerly record for this species in Montana.—
ARETAS A. SAUNDERS.

Two new records for Washington State.— The following birds appear to be new to the State list.

Ceryle alcyon caurina. NORTHWESTERN BELTED KINGFISHER.— A specimen taken September 17, 1896, was recently identified for me by Mr. Oberholser as this new form. It was collected by me on Puget Sound, in the vicinity of Tacoma, Wash., which I believe extends their range this much southward. As I have no other specimens, some further collecting must be done in order to prove this to be the resident form.

Zonotrichia albicollis. WHITE-THROATED SPARROW.— At Sherlock, in Thurston County, on October 13, 1912, I was so fortunate as to collect a female of this Sparrow. My bird was with a very large company of Nuttall's Sparrows (*Zonotrichia leucophrys nuttalli*), which had begun to arrive the previous evening, but a careful search failed to reveal any more *albicollis*. An interesting feature of this migration, possibly of some significance, is that the local breeding *nuttalli* had long since left for the south, and the migration in question was a considerable surprise to me. I believe my bird forms a new record for the state, if not for the Pacific coast north of Oregon.— J. HOOPER BOWLES, Tacoma, Wash.

A Correction.— In 'The Auk' Vol. XXVI, Jan., 1909, p. 9, under the heading of 'Some Birds of Baker Co., Oregon' the record of *Certhia familiaris montanus* should read *Certhia familiaris zelotes*. Since making the list three years ago more specimens have been taken and a skin recently sent to the Biological Survey was identified by Mr. H. C. Oberholser as *C. f. zelotes*.— STANLEY G. JEWETT, Portland, Oregon.

An Item for Bibliographers.— A paper dealing with American birds, which is seldom or never referred to is the following: Relation succincte d'un voyage fait aux bords de l'Oostanaula en Géorgie, États-Unis,¹ par Julien Deby.

All of the matter relating to birds is included in the following extract: "I am unable to describe in detail the pleasures of a search for Unios along the flowery banks of the Oostanaula, the pleasing Indian name of which means the great waters coming from the west.

"The exhilarating sunshine of this delightful clime; the sky of azure blue, rarely flecked with clouds; the thousands of turtles grouped upon every old log and rock that overhangs the water; the Kingfisher (*Alcedo alcyon*), with piercing cry, which constantly crosses from bank to bank, and perches upon some dead or denuded branch, where it watches for its aquatic prey; the palmipeds which jump into the air, frightened by the appearance of a boat and boatman; the buzzards (*Cathartes atratus et aura*), those vultures of the new world which soar overhead in lazy circlings, on the watch for some dead animal; all these new experiences make an ineffaceable impression upon the naturalist.

"The bushes and trees teem with life; birds of bright plumage abound everywhere; the mockingbird, the nightingale of America, enchants us with its sweet notes . . ."

This effusion which might well be mistaken for a description of Paradise, while a good advertisement for Georgia, was written, we must conclude, in retrospect, when distance lent enchantment to the view. Upon what other supposition are we to account for the author's failure to mention the mosquitos, ticks and redbugs, the deer flies, fleas and bedbugs, those satellites which oft attend travellers in Dixie, to journey's end.— W. L. McATEE, Washington, D. C.

¹Bul. de la Soc. Malacologique de Belgique XII, 1877, pp. XXI-XXV. Separates paged 1-7. The word voyage in title replaced by the word excursion. Bruxelles, 1877.

RECENT LITERATURE.

Forbush on the Game Birds, Wild-Fowl and Shore Birds.¹ This excellent report on the Water-Fowl and Game Birds of the Atlantic coast has been written, the author tells us, with a purpose — namely to set forth in an authoritative publication the facts in connection with the alarming decrease in the numbers of these birds in recent years and the imperative need of concerted efforts for their preservation. Those who read Mr. Forbush's report,— and everyone interested in game protection should do so — will agree that his purpose has been admirably accomplished. Not only in Massachusetts but in all of our eastern maritime states this book will be available as an incontrovertible argument against those who come forward to oppose legislative restrictions to gunning privileges, and who claim that game is not decreasing or that spring shooting has nothing to do with the problem.

Mr. Forbush cites reliable authors from early colonial times to the present day in sketching the history of each species, and in the majority of cases it is a history of decrease in numbers and abandoning of former breeding grounds, if not of threatened or actual extinction over at least part of the former range.

In addition, scores of reliable correspondents have supplemented the accounts, by furnishing valuable unpublished information drawn from their personal experiences.

Besides the history, each species is fully described in all the plumages in which it appears on our coasts, and a résumé is given of the time of occurrence and present abundance in Massachusetts. The nomenclature follows that of the last edition of the A. O. U. Check-List but the various vernacular names of the species are added, while the general range, usually that of the Check-List, is given. One unfortunate error in the Check-List which is copied by Mr. Forbush, should have been corrected in the recent supplement — namely the use of the name 'Red-legged Black Duck' in the Hypothetical List in connection with *Anas rubripes tristis*. The name *tristis* was not proposed for the red-legged bird but for the 'ordinary' Black Duck. The former name *obscura* being untenable, the oldest name for any form of Black Duck is *rubripes*; if there be but one form it should

¹ A History of the | Game Birds, Wild-Fowl | and Shore Birds | of | Massachu-
setts and Adjacent States | Including those used for food which have disappeared
since the | settlement of the country, and those which are now hunted | for food
or sport, with observations on their | former abundance and recent decrease | in
numbers; also the means for | conserving those still | in existence | By Edward
Howe Forbush | State Ornithologist of Massachusetts | Illustrated with Drawings
by W. I. Beecroft and the Author | and Photographs by Herbert K. Job and
others | Issued by the | Massachusetts State Board of Agriculture | By Authority
of the Legislature, 1912. Roy. Svo. pp. i-xiv + 1-622, plates I-XXXVI, text
figs. 1-26 [+ 82 not numbered].

be called *Anas rubripes* but if there be two then the Red-legged form is *Anas rubripes rubripes* and the dusky-legged form *A. rubripes tristis*. The systematic treatment of the species constitutes Part I.

Part II of the report comprises histories of the species which are extinct or extirpated in Massachusetts; the Great Auk, Labrador Duck, Eskimo Curlew, Passenger Pigeon, Trumpeter Swan, Whooping Crane, Sandhill Crane, and Wild Turkey.

Part III is an admirable discussion of the conservation of Game Birds in which every element receives careful consideration.

The problem is a serious one and one that must be considered promptly and exhaustively in every state in the Union, if we are to save many of our birds from the fate which has overtaken those mentioned above. Mr. Forbush suggests seventeen steps, all or most of which must be taken if we expect to increase the supply of game birds. These include the following: establishment of (1) bird reservations, (2) systems of federal control of migrating birds, and (3) systems of town wardens in addition to state wardens; prohibiting of (1) sale and export of game, (2) sale and use of ultra-destructive firearms, (3) shooting from boats; registration of native hunters and raising of fees for alien hunters, so as to be practically prohibitive; limiting of each day's bag; reducing the number of stray dogs and cats; checking forest fires; making the open seasons as nearly uniform as possible; encouraging the propagation and sale of such game as can be raised on game farms; and more important than all the establishment of a better attitude among the public at large toward the game laws. If the laws are wilfully disregarded as is frequently the case at present all hope for improved conditions might as well be abandoned. In this very field, more perhaps than in any other, Mr. Forbush's work will do an enormous good.—W. S.

Miller on the Classification of Kingfishers.¹—Work of the kind that Mr. Miller has here presented is most welcome. Whether the multitude of bird genera that have been proposed of late years is to stand or fall there can be no question but that we need light upon both internal and external characters of the species to guide us in our final judgment, and this so far as the Kingfishers are concerned is provided in the paper before us. The treatise is divided into two parts. I. The Subfamilies of Alcedinæ and II. The Genera of Cerylinæ. In the former Mr. Miller reaches the conclusion that three subfamilies should be recognized: *Cerylina*, *Alcedininæ* and *Daceloninæ*, the last two being more closely related to each other than is either to the *Cerylina*. *Ceyx*, *Ceycopsis*, *Ispidina* and *Myioceyx* he regards as members of the *Alcedininæ* rather than of the *Daceloninæ* where Sharpe placed them. In the association of these four genera with the other short tailed genera *Alcedo*, *Corythornis* and *Alycyon*, and the ex-

¹ A Revision of the Classification of the Kingfishers. By W. DeW. Miller. Bulletin of the American Museum of Natural History, XXXI, pp. 239-311. New York, September 12, 1912.

clusion of *Ceryle* we think that Mr. Miller is right and that the three sub-families recognized represent natural phylogenetic groups.

The latter half of the paper deals with the subdivision of the old genus *Ceryle* and voluminous data are presented to show the necessity for recognizing *Megaceryle* Kaup for the crested blue-gray species, and *Chloroceryle* Kaup for the neotropical bronze-green forms, as distinct from the black and white Afro-Indian birds which constitute true *Ceryle*. Here again Mr. Miller's action appears to be fully justified in so much as these groups are quite as distinct as the other genera of Kingfishers,—certainly more so than some of them, but it is unfortunate that the material was not available for a thorough investigation of the status of the genera in the other two subfamilies some of which we think rest upon very slight characters. Incidentally Mr. Miller calls attention to the necessity, on grounds of priority, of substituting *Choucalcyon* Lesson 1831 for *Sauromarptis* Cab & Heine, and *Lacedo* Reichenbach 1851 for *Carcineutes* Cab. & Heine.—W. S.

Reed's 'Birds of Eastern North America.'¹—This volume of 456 pages is, as we are told in the preface, 'but an extension of, an enlargement upon and a combining of' the 'Bird Guides for Land and Water Birds' by the same author. We do not think however that the additions in anyway compensate for what has been lost. The 'Bird Guides' held a place of their own in our ornithological literature as they were truly pocket guides whereas the present book, though just as useful as a work of reference, is no longer a pocket edition being both too large and too heavy. As a reference book too it comes directly into competition with numerous other works of similar scope, in some of which the additional information presented here is treated much more satisfactorily.

A curious feature is the use of the bird's name in the plural in almost every instance, the significance of which is not clear. 'Parula Warblers' obviously is intended to cover the two eastern races, while 'Cape May Warblers' must refer merely to several individuals of the species, but the statement that 'Sennett's White-tailed Hawks are southern species' leaves us in doubt as to just what idea the author desires to convey. There is but one form of Sennett's White-tailed Hawk and even that is not a species but a subspecies of *Buteo albicaudatus*! The attempt to explain the significance of binomials and trinomials on page ix moreover is not very happy.

While the colored pictures which appear on every page and which formed the distinctive feature of the 'Bird Guides' will still aid many students in identifying the birds they see, we trust that the handy smaller edition will not be withdrawn.—W. S.

¹ Birds of Eastern North American. By Chester A. Reed, S. B. With colored illustrations of every species common to the United States and Canada from the Atlantic Coast to the Rockies. Garden City, New York, Doubleday, Page & Company. 1912.

Hellmayr and Seilern on the Birds of the Cumbre de Valencia, Venezuela.¹— This important contribution to neotropical ornithology is based upon a collection of 1200 skins made by Mr. S. M. Klages in 1909 and 1910, and comprises annotations upon 172 species or subspecies, while a list of 39 species reported by other writers of this region but not obtained by Mr. Klages is added. The following forms are described as new either from the collection itself or from other material examined in connection with its study: *Tangara guttata bogotensis*, Bogota; *Xanthoura yncas andicola*, Merida, Venezuela; *Myiodynastes chrysocephalus venezuelanus*, Cumbre de Valencia; *Pseudocolaptes boissonneautii straticiceps*, Cumbre de Valencia; *Sittasomus griseus virescens*, Cumbre de Valencia, *Premnoplex brunnescens rostratus*, Cumbre de Valencia; *Drymophila caudata klagesi*, Los Palmales, Anden von Cumaná; *Chamaeza brevicauda boliviana*, Yungas, Bolivia. A number of North American species were found wintering in the region covered by Mr. Klages including *Hylocichla aliciae aliciae*, *Helminthophila* [= *Vermivora*] *peregrina*, *Mniotilta varia*, *Dendroica striata*, *D. caerulea*, *Oporornis agilis*, *Setophaga ruticilla* and *Piranga rubra rubra*.— W. S.

Hellmayr on *Zonotrichia strigiceps* Gould.²—Mr. Hellmayr reviews the history of this little known finch and tabulates the specimens so far obtained. He finds that they are separable into two races, *Z. strigiceps strigiceps* ranging from Paraná to Cordoba, in Brazil and Argentina, while *Z. s. dabbeni* described as new is restricted to the mountains of north-western Argentina.— W. S.

Nelson on New Birds from Panama, Colombia and Ecuador.³— This paper comprises the new birds obtained by Mr. E. A. Goldman on Mount Pirri and vicinity in eastern Panama near the Colombian border, from January to June, 1912, under the auspices of the Smithsonian Biological Survey of the Panama Canal Zone. This mountain reaches an altitude of 5,200 feet and as no zoölogical collector seems to have visited it previously, new forms were naturally to be expected from its slopes. Besides the new birds here described, many South American species were found which are unknown farther north. The new forms named by Mr. Nelson are as follows: *Geotrygon goldmani*, *Chloronerpes chrysochlorus aurosus*, *Aulacorhynchus caeruleigularis cognatus*, *Momotus conexus reconditus*, *Electron platyrhynchus suboles*, *Eriocnemis floccus*, *Phathornis adolpheii fraterculus*,

¹ Beiträge zur Ornithologie von Venezuela. Von C. E. Hellmayr und J. Graf von Seilern. I Die Vögel der Cumbre de Valencia. Archiv für Naturgeschichte. Vol. 78, pp. 34-166, September 20, 1912.

² Bemerkungen über eine wenig bekannte, neotropische Ammer (*Zonotrichia strigiceps* Gould). Verhandlungen der Ornith. Gesellschaft in Bayern. XI, pp. 187-190. July 1, 1912.

³ Descriptions of New Genera, Species and Subspecies of Birds from Panama, Colombia and Ecuador. By E. W. Nelson. Smithsonian Miscellaneous Collections, Vol. 60, No. 3, pp. 1-25, Sept. 24 [= 27], 1912.

Thamnistes anabatinus coronatus, *Dysithamnus mentalis suffusus*, *Herpsilochmus rufimarginatus exiguus*, *Grallaricula flavirostris brevis*, *Margarornis bellulus*, *Mitrephanes eminulus*, *Caryothraustes canadensis simulans*, *Tanagra fucosus*, *Chrysothlypis chrysomelas ocellaris*, *Vireolanus eximius mutabilis*, *Basileuterus melanogenys ignotus*, *B. m. eximius*, *Troglodytes festinus*, *Myadestes coloratus*, *Catharus fuscater mirabilis*. There are also three new species for which Mr. Nelson establishes new genera: *Goethalsia bella* on interesting hummingbird allied to *Goldmania*, and named in honor of Col. Goethals, head of the Panama Canal Commission; *Prædo audax*, a flycatcher allied to *Aphanotriccus* but resembling *Empidonax* in color; and *Hylospingus inornatus* a tanager resembling *Chlorospingus*. Incidentally Mr. Nelson also describes *Tanagra xanthogastra quitensis* from Quito, Ecuador, and *Hemithraupis ornatus* from Truando, Colombia. The Genus *Tanagra* is used by Mr. Nelson for the genus formerly called *Euphonia* while *Tangara* is used in place of *Calospiza* (= *Calliste*). This seems inevitable if we regard these names as different and take them from the first place of publication but in the absence of any word of explanation it is misleading to those not familiar with the history of the case.—W. S.

Oberholser's Revision of the Green Herons.¹—As the result of a critical study of 568 specimens of Green Herons, *Butorides virescens*, Mr. Oberholser recognizes eighteen geographic races, twelve of which are here named as new. These are *B. v. eremonomus*, north central Mexico; *B. v. mesatus*, western Nicaragua; *B. v. hypernotius*, Costa Rica to Brazil; *B. v. margaritophilus*, San Miguel Island, Bay of Panama; *B. v. cubanus*, Greater and northern Lesser Antilles; *B. v. christophorensis*, St. Christopher; *B. v. dominicanus*, Dominica; *B. v. lucianus*, St. Lucia; *B. v. barbadosis*, Barbados; *B. v. grenadensis*, Grenada; *B. v. tobagensis*, Tobago; and *B. v. curaçensis*, Curaçao.

Mr. Oberholser has presented extremely detailed descriptions and a large array of measurements and his paper represents a painstaking piece of work. Whether ornithologists will endorse his views remains to be seen. With practically the same material before them Messrs. Thayer and Bangs have already (Bull. Mus. Comp. Zool., 46, p. 142) expressed precisely opposite views on the status of the San Miguel Island birds and have questioned the distinctness of several of the forms named up to that time. As San Miguel Island is but twenty miles off shore, it would indeed seem remarkable that a bird of the size and habits of a heron should there become differentiated into a local race, and in considering any group of large water birds it would seem that much more latitude should be given to individual varia-

¹ A Revision of the Subspecies of the Green Heron (*Butorides virescens* [Linn.]). By Harry C. Oberholser. Proc. U. S. Nat. Museum, Vol. 42, pp. 529-577. August 29, 1912.

tion, and the greater possibility of passage from one island to another be admitted, than in the case of small resident passerine species.—W. S.

Oberholser's One Hundred and Four new Birds from the Barusan Islands and Sumatra.¹—To those who are familiar with Mr. Oberholser's painstaking monographic work and detailed descriptions the present contribution must come as a distinct shock. The presentation of 104 new forms on 21 octavo pages naturally permits of but very brief diagnoses, but so short are some of these here given, that for all practical purposes they might as well have been omitted entirely, leaving simply a type locality. For example *Meiglyptes grammithorax micropterus* is described as "Resembling *Meiglyptes grammithorax grammithorax*, but smaller.", followed by the citation of a type specimen in the U. S. National Museum, from Nias Island. We know from this that a name has been given to a form of *M. grammithorax* from Nias, but beyond that, without measurements or further diagnosis, the publication is absolutely worthless. With a specimen of this group in hand from a neighboring island one could not possibly identify it without examining Mr. Oberholser's type. In the entire 104 diagnoses, measurements are given in only twelve instances while the descriptions average two and a half lines, including a trinomial name mentioned for comparison!

In such contributions the advancement of science seems to have been completely lost sight of, and the only explanation would seem to be the desire to secure the species to an author or the types to an institution. The promise of later detailed publications does not constitute an excuse for the issue of such useless diagnoses.

If publication of species in advance of faunal papers is absolutely necessary, the journal should devote the space, and the author the time, necessary to make the diagnoses adequate. Our rules of nomenclature are binding us more and more to the original descriptions in all systematic work and it behooves us to make these adequate.

This criticism is not directed at Mr. Oberholser but at a practice that is all too common and which we are sorry to see endorsed by him and by the Smithsonian Institution.

In foot-notes several nomenclatural matters are briefly discussed. *Dendrophassa* Gloger 1842 is substituted for *Osmotreron* Bonap. on ground of priority, while *Treron nipalensis* (Hodgson) is changed to *T. curvirostra* (Gmelin) for the same reason. *Psittinus cyanurus* (Forster) is shown to be the proper name for the bird commonly called *P. incertus* (Shaw.), while *Mixornis gularis* (Raffles) becomes *M. pileata* (Blyth), and *Lalage terat* Auct. becomes *L. nigra* (Forster). So also *Cinnyris pectoralis* (Horsf.) becomes *C. ornata* Less. and *Chalcopteryx phænicotis* Auct. becomes *C. singalensis* (Gm.).—W. S.

¹ Descriptions of One Hundred and Four New Species and Subspecies of Birds from the Barusan Islands and Sumatra. Smithsonian Miscellaneous Collections. Vol. 60, No. 7, pp. 1-21. October 26, 1912.

Mathews' 'Birds of Australia.'¹—Parts 3 and 4 of the second volume of Mr. Mathews' great work are before us testifying to the energy with which the publication is being carried on. In style these parts are similar to those that have preceded them and they are fully up to the high standard that characterized the first volume. The only point wherein Mr. Mathews' work seems open to criticism is in his failure to designate type specimens for the extralimital races that he is constantly describing as new, and in the brevity of some of these descriptions. The latter practice the writer has just had occasion to criticise in another connection, while in the matter of types he has recently been put to so much trouble in attempting to ascertain the type specimens of Gould's species of Australian birds, that he naturally regrets that the modern authority on Australasian ornithology should follow, in the case of these forms, the bad example set by his predecessor. Such a practice will cause some one much trouble and research in the future.

The two parts under consideration comprise 240 pages and 26 plates practically completing Volume II. They cover the remainder of the Procellariiformes and most of the Lariformes.

The following forms are described as new, most of them from localities outside Australia. In part 3: *Pelecanoides urinatrix coppingeri*, Straits of Magellan; *Puffinaria garnotii lessoni*, Coast of Chili; *P. g. magellani*, Straits of Magellan; *Diomedea exulans rothschildi*, Australian Seas; *Thalassarche melanophris impavida*, Tasmania; *T. m. belcheri*, Kerguelen; *T. m. richmondi*, West coast of South America; *Thalassogeron chrysostoma harterti*, Kerguelen; *Phæbetria palpebrata huttoni*, New Zealand Seas; *P. fusca campbelli*, Australian Seas; *Hydrochelidon leucopareia leggei*, Ceylon; *H. l. delalandii*, South Africa; *H. l. swinhæi*, China; *Gelochelidon nilotica addenda*, China; *G. n. grönvoldi*, South America; *Thalasseus bergii bakeri* Mekran Coast; *T. b. edwardsi*, Ceylon; *T. bengalensis arabicus*, Red Sea. In part 4: *Sterna dougallii bangsi*, Foochow, China; *S. d. arideensis*, Seychelles; *Sturnula nereis exsul*, New Caledonia; *Melanosterna anathetus recognita*, Bahamas; *Anous stolidus gilberti*, S. W. Australia; *Megalopterus minutus americanus* Caribbean Sea, British Honduras, *M. m. atlanticus*, Ascension Isl.; *Procelsterna cerulea nebouxi*, Elllice and Phœnix groups and Samoa; *P. c. imitatrix*, St. Ambrose group; *Gygis alba royana*, Kermadec Islands; *G. a. monte*, Seychelles; *Bruchigavia novæ-hollandiæ forsteri*, New Caledonia. *Leucanous* is proposed as a new genus with *Gygis micro-rhyncha* as type, and the following subgenera are noted, *Nealbatrus*, type *Thalassogeron chlororhynchos*; *Diomedella*, type *Th. cautus*; and *Gygisterna*, type *Sterna sumatrana kempii*.

Several of Mr. Mathews' proposed changes in nomenclature affect the A. O. U. Check-List. *Thalassogeron culminatus* appears as *Th. chrysostoma culminata*, *Phæbetria palpebrata* is apparently his *P. p. huttoni*, *Gelo-*

¹The Birds of Australia. By Gregory M. Mathews. With hand-colored Plates, Roy. 4to. Witherby and Co., London.

chelidon nilotica is *G. n. aranea* (Wilson), *Sterna caspia* becomes *Hydroprogne tschegrava imperator* (Coues), and *S. anathetus* becomes *Melanosterna anathetus recognita* Mathews. *Phæbastris*, *Thalasseus*, *Hydroprogne*, *Onychoprion*, *Sternula* and *Melanosterna* are regarded as genera, while in *Hydrochelidon leucoptera*, *Sterna dougalli*, *S. fuscatus* and *Anous stolidus* the specific name must be repeated on account of the recognition of extralimital races.

In the substitution of *Hydroprogne* for *Thalasseus* and *Thalasseus* for *Actocheilidon*, Mr. Mathews has the writer's hearty support.—W. S.

Bickerton's 'Home-Life of the Terns.'¹—This attractive volume constitutes the fourth of the 'Bird Lover's Home-Life Series.' In it Mr. Bickerton tells us of his visits to several Tern colonies on the English coast and his experiences in studying and photographing the five British breeding species—the Arctic, Common, Sandwich, Lesser and Roseate Terns. One chapter is devoted to Terns' habits in general, and one each to the species here especially considered while some additional notes on the Common Tern are given in chapter VII. The accounts are written in an attractive style and contain much information of value to the ornithologist as well as to the bird-lover.

We learn from Mr. Bickerton's pages that the Arctic Tern is by far the most abundant breeding species in Great Britain today, one colony numbering at least ten thousand pairs; the Common Tern comes next, the Lesser Tern is not so numerous, the Sandwich decidedly rare and the Roseate extremely so.

The protection afforded these birds during the breeding season is yielding encouraging results. In the case of the Sandwich Tern in the Ravensglass 'Gullery', which is carefully guarded by Lord Muncaster, the number of eggs recorded by the warden has increased from 120 in 1900 to 403 in 1912. As a protection against the unscrupulous raids of collectors the freshly laid eggs are each day marked by the warden with an indelible purple pencil so as to make them valueless as specimens. An idea of the rarity of the Roseate Tern may be gained from the fact that the only breeding colonies that could be found were located on rocky islets, inhabited by Arctic and Common Terns, and numbered all told not over 15 or 20 pairs while the other two species numbered respectively 10,000 and 1000 pairs. Mr. Bickerton found the Roseate Terns laying but a single egg in every nest examined, due possibly to this being on the northern limit of their breeding range.

American readers of this interesting volume will find in it a reminder of what might have been, on the New Jersey coast and elsewhere on our shores,

¹ The Home-Life of the Terns or Sea Swallows Photographed and described By W. Bickerton, F. Z. S., M. B. O. U., Vice-President of The Hertfordshire Natural History Society and Field Club, with thirty-two mounted plates London | Witherby & Co., 326 High Holborn W. C. | MCMXII, pp. 1-88, plates 1-32.

where the once countless hosts of breeding water birds have been practically exterminated.

Mr. Bickerton's excellent photographs are reproduced in half-tones of high quality which are mounted upon dark brown paper making a very effective series of illustrations.— W. S.

Shelley's 'Birds of Africa.'¹— The publication of this important work has been resumed after an interval of six years. Soon after the appearance of the first part of Volume V the author suffered a stroke of paralysis which resulted in his death in 1910. Arrangements were then made with Mr. W. L. Sclater to continue the undertaking and under his able direction it is hoped to bring it to an early completion.

The present volume is mainly edited from manuscripts already prepared by Capt. Shelley and covers the Shrike-like birds *Dicruridæ*, *Vangidæ*, *Campophagidæ*, *Laniidæ* and *Prionopidæ*.

Two hundred and nine species are included, some of which have several subspecies. Eight colored plates similar in style to those of previous parts illustrate the volume.— W. S.

Horsbrugh and Davies on The Game-Birds and Water-Fowl of South Africa.²— Part 3 of this excellent work is now before us comprising the remainder of the Gallinaceous birds, mainly Guinea-Fowls; the Sandgrouse, Pigeons and some of the Anatidæ. The plates, sixteen in number, are fully up to the standard of the previous parts.

Major Horsbrugh finds that contrary to the statements of some authors the Common Guinea-Fowl of South Africa breeds readily in captivity and crosses freely with the domestic birds.— W. S.

Thayer's Concealing Coloration, an Answer to Theodore Roosevelt.³— Mr. Thayer here defends his views against the criticism of Col. Roosevelt published in the American Museum Bulletin⁴ a year ago. He emphasizes the inconspicuousness of white at night, and reiterates several of the statements set forth in his book, which he claims his critics have entirely failed to understand. Those interested in this controversy should read Mr. Thayer's paper in full.— W. S.

¹ The Birds of Africa, comprising all the species which occur in the Ethiopian Region. By G. E. Shelley, F. Z. S., F. R. G. S., &c. Completed and Edited by W. L. Sclater, M. A., F. Z. S. Vol. V, Pt. II. London: Henry Sotheran & Co. 1912. Roy 8vo., pp. 165-502, plates L-LVII.

² The Game-Birds and Water-Fowl of South Africa. By Major Boyd Horsbrugh and Sergeant C. G. Davies. London: Witherby & Co., 326 High Holborn, W. C. Part 3. September 30, 1912.

³ Concealing Coloration, an Answer to Theodore Roosevelt. By Abbott H. Thayer. Bulletin American Museum Nat. Hist., Vol. XXXI, pp. 313-321. New York, September 14, 1912.

⁴ Vol. XXX, pp. 119-231.

Strong on Teaching a Bird Course.¹—Dr. Strong outlines his methods of conducting bird classes at the University of Chicago and his suggestions will prove valuable to teachers engaged in the same line of work. Laboratory work consists of identifications from skins which, to avoid wear and tear are wired onto handles upon which their measurements are marked. Lantern slides are also shown to test ability in identification, the students writing down the names of the birds as they appear on the screen. Field work is conducted twice a week in the spring from 7.40 to 9.10 A. M., full observations being recorded on each species observed. As Dr. Strong remarks the main object of students selecting this course is to learn to identify the birds and consequently the course is adapted to this end.—W. S.

Beal on the Food of our More Important Flycatchers.²—The food habits of these birds are discussed at length by Prof. Beal in the manner made familiar to our readers in previous publications of the Biological Survey.

Analyses of stomach contents of the 17 species of Flycatchers here considered shows that 94.99 percent. of their food consists of insects and spiders. Of this hymenoptera — bees, wasps, etc. constitute more than a third and as these insects are for the most part beneficial, this element must be weighed against the destruction of noxious species, which Prof. Beal considers more than balances it. Curiously enough the destruction of honey bees popularly charged against the Kingbird seems to have been greatly exaggerated and the greatest harm done by the birds lies in the destruction of small parasitic hymenoptera.

Admirable plates by Fuertes, all but one in colors, illustrate this valuable bulletin.—W. S.

Beal and McAtee on Food of Some Well-known Birds.³—The results of stomach examinations and field observations on twenty common birds not included in Bulletin No. 54 are here set forth, two of the species being treated by Mr. McAtee and the rest by Prof. Beal. In these publications the Department of Agriculture is spreading broadcast information on the habits and value of our birds, the influence of which has had much to do with the constantly increasing attention that is being given to bird preservation in America.—W. S.

¹ Some Ideas on Teaching a Bird Course. By R. M. Strong. Nature Study Review, Vol. 8, No. 5, pp. 1-7.

² Food of our More Important Flycatchers. By F. E. L. Beal. Bulletin 44, Biological Survey, U. S. Dept. of Agriculture, pp. 1-67, plates I-V. September 19, 1912.

³ Food of Some Well-known Birds of Forest, Farm, and Garden. By F. E. L. Beal and W. L. McAtee. Farmers' Bulletin, No. 506, U. S. Department of Agriculture, pp. 1-35, figs. 1-16. September 25, 1912.

Palmer on National Reservations for the Protection of Wild Life.— In this circular¹ Dr. Palmer has brought together for handy reference a list of the various National reservations, where birds and wild life in general are afforded protection, together with statistics upon their extent and history of their establishment. Some information is also presented on the species of birds and game found on certain reservations, while a bibliography furnishes titles of various papers dealing with this subject. There are 95 of these reservations at present, located in 27 states and territories, and of these 56 were set aside especially as bird refuges during the past nine years. — W. S.

Economic Ornithology in Recent Entomological Publications.— A résumé of the entire boll weevil investigation, by W. D. Hunter and W. D. Pierce, has been published as a Senate Document.² It discusses all kinds of natural enemies of the boll weevil, including birds. A schedule of stomach examinations of birds which had eaten boll weevils, on p. 146, is reprinted from Biological Survey Circular No. 64. The comment on this table is as follows:

"Exhaustive studies of the stomachs of many birds killed in infested cotton fields by the agents of the Biological Survey of this department have emphasized the fact that the birds play a considerable part in the control of the adult boll weevils. The investigation has resulted in a list of 53 species which more or less commonly feed upon the adult weevils. . . .

"It will be noticed that the largest numbers of boll weevils were eaten during the months of July, August, and September, and also that a considerable number are consumed during the hibernating season. The most important birds are those that capture the boll weevil during the winter. According to this table these are the three species of blackbirds, two meadowlarks, six species of native sparrows, the pipit, the three species of wrens, and the two species of titmice. It will be noted that only one of the 108 quail stomachs examined showed remains of the boll weevil." On p. 145 is recorded Mr. E. A. Schwarz's observation that in Cuba "an oriole (*Icterus hypomelas*) has developed a habit of extracting the immature stages from the bolls and squares."

Another weevil (*Lissorhoptrus simplex*) is said to be the most serious insect enemy of growing rice. The larvæ feed on the roots and the adults on the leaves of the rice plant. The only natural enemies recorded are birds, the records (furnished by the Biological Survey) being for the Long-billed Marsh Wren and Mallard Duck. The author of the circular³ on the rice water-weevil states that Mr. C. E. Hood of the Bureau of Entomology

¹ National Reservations for the Protection of Wild Life. By T. S. Palmer. Circular No. 87. Bureau of Biological Survey, U. S. Department of Agriculture, Svo., pp. 1-32, figs. 1-5. October 5, 1912.

² 62nd Congress, 2nd Session, No. 305, 1912, 188 pp.

³ Tucker, E. S., No. 152, U. S. Bur. Ent. July 10, 1912, 20 pp.

found remains of this species in bird droppings at Stuttgart, Ark. One of two perfect specimens of the weevil, removed from droppings was found to be alive. This observation parallels that recorded by Osborn¹ that a living specimen of another species of weevil (*Macrops lineatulus*), was found alive in bird excrement.

A third species of weevil, the plum curculio, is comprehensively monographed in Bull. 103 of the Bureau of Entomology (July 13, 1912, 250 pp.). This important pest, which causes an annual loss of several million dollars, has numerous natural enemies among which are 7 species of birds. As early as 1865, Dr. Isaac Trimble recorded that the Baltimore Oriole feeds on this insect. Investigations by the Biological Survey have confirmed this observation and have added the following names of bird enemies of the plum curculio: Orchard Oriole, Rose-breasted Grosbeak, Bank Swallow, Yellow-throated Vireo, Veery, and Hermit Thrush.

In Bulletin 106,² "The life history and bionomics of some North American ticks," notes are given on the bird enemies of 5 species of these pests. Most of the records refer to enemies of the North American cattle tick. In this connection, Pycraft is quoted relative to the depraved habit of the African Oxpecker (*Buphaga africana*) of enlarging and feeding at holes in the hides of cattle from which it has removed ticks. This publication also gives many records of the occurrence of ticks upon birds.

Five bird enemies of the spring grain aphid or green bug are mentioned by F. M. Webster and W. J. Phillips in their bulletin³ on that insect. These records were furnished by the Biological Survey and are part of the results of an investigation of the relations of birds to the green bug carried on at Winston-Salem, N. C., in 1909. A full account of this study will be published in the next Yearbook of the Department of Agriculture.

The first general economic treatment of an interesting group of insects, is Professor Herbert Osborn's "Leafhoppers affecting cereals, grasses, and forage crops (Bull. 108, Sept., 1912). More than 12 pages are devoted to a discussion of the natural enemies, 9 of them to birds. A tabulation is given of all the records (up to Jan., 1912) of leafhoppers found in bird stomachs by the Biological Survey.

The Biological Survey records show that 770 stomachs out of a total of about 47,000 examined contained leafhoppers, a proportion of about 1 in 61. Numerous species of birds are shown to eat comparatively high percentages of Jassidæ as *Setophaga ruticilla*, 13; (based on 17 stomach contents), *Polioptila cœrulea*, 7.17 (39 stomachs), *Polioptila californica*, 11 (31), *Sitta pygmaea*, 43 (32), *Aimophila ruficeps*, 2.6 (25), *Passerherbulus caudacutus*, 6 (44), *Calypte anna* 5.3 (111), *Dendroica aestiva*, 3.7 (116), *Lanivireo solitarius*, 6 (47), *Regulus calendula*, 5.7 (300), *Tachycineta thalassina*, 7.62 (80), *Telmatodytes palustris*, 4.55, (59), *Thryomanes bewicki*,

¹ Western Stock Journ. & Farmer. 10 p. 101, May, 1880.

² Hooker, W. A., Bishopp, F. C., and Wood, H. P., September, 1912.

³ 110, September, 1912.

3.03 (152), *Vireo huttoni*, 4.7 (58), and *Wilsonia pusilla*, 5.6 (67). In addition several other species of birds, whose food habits are known from examination of a large number of stomachs, eat leafhoppers to an extent of from 1.28 to 3 per cent. of their annual diet. This group includes such common species as *Chordeiles virginianus*, *Sayornis phæbe*, *Archilochus colubris*, *Empidonax difficilis*, *Geothlypis trichas*, *Iridoprocne bicolor*, *Penthestes rufescens*, *Petrochelidon lunifrons*, and *Riparia riparia*.

These 24 species certainly feed as extensively as could reasonably be expected upon this single rather restricted group of insects. In the writer's opinion this is true also of other species among those whose Jassid feeding records are tabulated. But Professor Osborn draws a different conclusion part of which is as follows: "While at first thought we might consider birds as a most important element in control of these insects, a closer study reveals many reasons why they must depend upon them but little as a food supply. Even with this more conservative view in mind, however, the actual conditions as represented by the records of the Biological Survey are rather disappointing since they show that for practically all of our birds the leafhoppers constitute so small a portion of their food supply that birds very properly may be considered as almost negligible in any consideration of the natural agencies of control." (p. 23.)

Let us see what is said regarding some of the other natural checks. Again quoting: "Among the predaceous forms we have as the most abundant and efficient perhaps the little bugs of the family Nabidæ, some of which occur in great abundance in the meadows and pastures where the leafhoppers occur. The most abundant of the species is *Reduviolus ferus* L., which occurs throughout the entire range of the United States and may be found in almost every kind of grassy land. That it is a frequent predator upon the leafhoppers is indicated by its attack upon them when they are taken in the net, although it must be said that they are very seldom found with the insects actually impaled upon their beaks in the field. It is probable that this comes from their puncturing and sucking the blood of the insect very quickly and discarding the dead bodies so promptly as not to be found with them actually impaled. I have no question that they feed upon the leafhoppers as one source of their food supply, and believe them to be one of the principal agencies in keeping the leafhoppers in check." (p. 32.)

Thus probabilities and beliefs as to efficiency give this natural enemy a high rank while nearly five pages of finely printed tabulation showing the extent to which more than 120 species of birds are known to feed upon these insects, show in this author's opinion that "birds very properly may be considered as almost negligible in any consideration of the natural agencies of control."

Another case concerns the genus *Geocoris* in the family Lygæidæ. Several reports that they attack leafhoppers and one definite record elicit the remark that they "certainly must contribute largely toward the reduction of the leafhopper pest." (p. 33.) A page of generalities upon the probable leafhopper enemies among spiders, with no definite instances what-

ever of spiders preying upon these insects preface the following remark: "When we consider the carnivorous habit and observe the immense numbers of spiders in the fields, and realize that in many cases leafhoppers are the most abundant and accessible food supply for them, it is easy to credit the spiders with immense service in this direction." (p. 35.)

In view of the nearly complete lack of evidence these strong claims for the value of spiders and heteroptera, as enemies of leafhoppers, are entirely unjustified. The tone of this section of the discussion of natural enemies, bears no relation to that of the section treating birds; the treatment is illogical and unjust.

Probably on account of long concentration upon the group of leafhoppers, the author has let this really inconsiderable portion of our insect fauna, obscure his sense of proportion. An oak leaf held close to the eyes will hide the world. As a matter of fact leafhoppers are only a small section¹ of one order of insects, and not only are some other groups of this order just as abundant in individuals, but the same is true of many groups in other orders. Birds draw their food from all these sources and there is no evidence that leafhoppers contribute less than their appropriate proportion to the total food of birds.

The author therefore has no right to be disappointed that leafhoppers constitute a small portion of the food of practically all our common birds. So also do the Coccidæ or scale insects, the Tettigidæ among Orthoptera, the Carabidæ, among beetles, etc., but this is no proof that these insects are not preyed upon in the proportion of their abundance to that of insects as a whole. It must be remembered also that animal food as a whole including crustacea, mollusca, arachnida, other invertebrates and vertebrates, forms probably not more than half of the total food of birds, this circumstance reducing by half the percentage required to give any group of animals proportional representation in the subsistence of birds. Furthermore it must be recognized that many common birds have arboreal or other specialized habits that keep them out of grass lands, the metropolis of leafhoppers.

It would be just as reasonable to say that hymenoptera may be considered as negligible in the control of leafhoppers, because only a few species are recorded as parasites of leafhoppers, and the majority of the species leave them alone, yet the author says that this order as a means of control is perhaps far more important than we readily appreciate. It probably cannot be proven that any class of predaceous or parasitic enemies of insects takes more than a small proportion of the total number of any restricted group of the prey (averaging the results for a long series of years).

In brief the arguments made by the author in the case of bird enemies

¹ For instance the number of species of leaf-hoppers forms only 1.34 per cent of the total number of species in Smith's "Insects of New Jersey" and only 1.22 per cent of the insects of the world as tabulated by Handlirsch (Die Fossilen Insekten, Part VI).

of leafhoppers, apply just as well to their other enemies. For instance he says (p. 32) of the genus *Reduviolus* of the Heteroptera, I "believe them to be one of the principal agencies in keeping the leafhoppers in check." Why does he not say the Heteroptera are of no importance as enemies of leafhoppers because only a small proportion of the species have been observed to attack them? This argument would be by no means so far fetched as that relating to birds on p. 23, namely, that as leafhoppers were found in only 170 stomachs out of 47,000 examined, birds "very properly may be considered as negligible in any consideration of the natural agencies of control."

Osborn's further remarks that "it is useless to depend on birds for control of these insects. No amount of 'encouragement for the birds' or efforts to utilize their service in this direction can be expected to have any appreciable effect in reducing the number of leafhoppers, and we may dismiss this idea and turn our attention to other more hopeful agencies," are futile and gratuitous. This relation of enemies to prey is true not only of birds but of all natural enemies under natural conditions. It has been possible only in a very few cases to use any kind of natural enemies with striking success and as for control, it has never been accomplished except for limited areas by methods such as are now used in the distribution of the ladybird *Hippodamia convergens* by the California Board of Horticulture.

Some find it difficult to accept the inevitable truths regarding natural enemies, but happily extravagant claims for this enemy or condemnation of that, are largely disappearing from modern publications. All natural enemies should be given credit for useful tendencies, and their protection urged, but the fact must never be obscured that to obtain the degree of control necessary to commercial success, man must practically invariably depend upon direct suppressive measures of his own devising.—W. L. M.

Economic Ornithology in California.—Mr. Harold C. Bryant, who is working as a fellow in applied zoölogy on the State Fish and Game Commission foundation in the University of California, is devoting his attention to problems in economic ornithology. With Professor F. E. L. Beal's comprehensive work, embodied in Biological Survey Bulletins 30 and 34, as a general treatment of the subject and with intelligently directed local work such as Mr. Bryant is doing, to fill in the details, the economic ornithology of California will be better understood than that of any other state. Mr. Bryant has already published several papers dealing with his investigations, three of which are here reviewed.

The economic status of the Meadowlark in California, has for some years been a burning question and naturally this problem has occupied much of Mr. Bryant's time. He has recently published a preliminary paper on the subject.¹ Ranchers in the San Joaquin and Sacramento Valleys report the loss of from one-third to one-half of their grain crops

¹ Monthly Bull. State Comm. Hort. 1. No. 6, May, 1912, pp. 226-231.

due to the depredations of meadowlarks on the sprouting seed. It is no wonder therefore that bills removing protection from the bird have been introduced and strenuously supported in the State legislature. Mr. Bryant's investigations justify the charges of injury to grain, but also show that as a destroyer of cutworms and grasshoppers, the meadowlark is probably unequalled by any other California bird. Thus the bird feeds upon grain pests, and clearly does a great deal to offset the direct damage it commits. Whether the bird fully pays for the grain it destroys, can only be determined when the investigation is completed.

The second paper deals with "The present and future status of the California Valley Quail."¹ While the whole paper may be considered economic ornithology in a broad sense, it does not treat the food habits in a detailed way. Mr. Bryant discusses chiefly the decrease of the bird due to hunting, and methods of preserving it in normal numbers, including recommendations on the amount of shooting that may be allowed.

The reviewer finds himself unable to agree with Mr. Bryant's statement that "Food supply is probably, in the last analysis, the most important of the factors governing numbers under natural conditions," at least with reference to species such as Quail which can if necessary live wholly upon seeds and browse. It is admitted of course that the food supply would set a definite limit did species increase up to the point of exhausting it, but normally seed-eating birds as a whole seem to come nowhere near that point. There are always tons upon tons of seeds left to decay after the requirements of all seed eaters, and of reproduction of the plants themselves are satisfied. Lack of versatility in foraging, or idiosyncrasies as to the time or place of feeding, or as to the nature of the food, may at times tend to check the increase of a species. In the East cases are recorded, and they were especially numerous about Washington last winter, in which snow-bound Quail have started to death in sheltered places, when plenty of food could be had for the searching. It is true that these deaths may have been due solely to severe and unaccustomed cold, and if this is true, it opposes the familiar argument that abundance of food is sufficient protection against freezing.

In a third paper entitled "Birds in Relation to a Grasshopper Outbreak in California,"² Mr. Bryant says: "Certain sections of California are annually troubled with grasshoppers, and there is seldom a year when they do not cause considerable damage in some part of the State. . . . Reports of damage caused by grasshoppers in 1912 first began to appear in June. The western part of Merced County, and parts of Kings and Kern Counties, were most affected. The present investigation was largely carried on in the vicinity of Los Banos, Merced County, this being one of the worst centers of infestation." (p. 3) . . . "Little damage could be noted where the grasshoppers were less than fifteen to the square yard. Where damage was

¹ Condor, XIV., July, 1912, pp. 131-142.

² Univ. Calif. Publ. Zool., Vol. 11, No. 1, Nov. 1, 1912.

greatest, alfalfa fields averaged about twenty-five to the square yard. In some pasture land along the canals, the numbers were estimated at thirty per square yard."

"Los Banos, largely on account of its great irrigation system and the large amount of land which has been swamped, supports a very large bird population. Water-birds and shore-birds are very abundant along the canals and in the marshes, whereas the pasture lands, alfalfa and the trees, furnish food and cover for many land birds. During the week's stay, July 10 to 17, 1912, twenty-two species of water- and shore-birds were recorded, and forty species of land birds." (p. 4.)

"Blackbirds, kingbirds, shrikes, and meadowlarks appeared to be feeding almost wholly upon grasshoppers, and so must be considered among the most efficient destroyers of these insects. Kingbirds and shrikes, better known as butcherbirds, were constantly seen to catch a grasshopper, carry it to the telephone wires, beat it to pieces, and eat it. The work of these birds and also of blackbirds and orioles was so evident that several ranchers reported these birds as being beneficial in the destruction of grasshoppers." (p. 7.)

"Only a few birds of each species were examined, but even these small numbers should give a fairly accurate idea of the extent to which birds in the infested areas were feeding on grasshoppers." . . . "The burrowing owl must be considered the most efficient destroyer, since parts of twenty-eight grasshoppers were found in the one stomach examined. Blackbirds and meadowlarks, however, because of the large numbers of individuals, were doing the most effective work." (pp. 7-8.)

The total number of grasshoppers daily destroyed by the entire bird population per square mile in the infested area, is estimated at 120,445, and Mr. Bryant adds: "Emphasis can well be placed on the fact that a diminution of the numbers of an injurious insect must cause a corresponding diminution of the damage done. If twenty grasshoppers are causing damage on a square yard of alfalfa the loss of even two must cause some diminution in the amount of damage done, however slight it may be. Consequently the large numbers of grasshoppers taken by birds during the outbreak must have meant a decrease in the possible damage in spite of the fact that such a decrease could not be noted." (pp. 16-17.)

Possibly this conclusion is accurate with regard to injury by grasshoppers, but it is obvious that it is not widely applicable to the reduction of damage by the destruction of insect pests by their natural enemies. For instance after even a high percentage of such pests as the plum curculio, codling moth, nut-weevils and the like, are destroyed, if the survivors thoroughly distribute their eggs, the damage to the crop will be as great as before, since one larva in a fruit as effectually ruins it for marketing as would several. It may further be remarked with reference to Mr. Bryant's statement that a decrease in damage which cannot be noted is not commercially significant.

The author's conclusions, in the main are very conservative: "Since

the time of the Mission fathers," he says, "when grasshoppers were first recorded as giving trouble, these insects have continued their ravages. The bird population during that time has undergone a considerable change. Certain water- and shore-birds, many of them known to be efficient grasshopper destroyers, and especially important because of their migratory habits, have been greatly reduced in numbers. On the other hand certain land birds, owing to a better food supply and cover, have increased in number. Perhaps the most notable example of this increase is to be found in the meadowlark, a bird which feeds almost entirely on grasshoppers when they are abundant. It seems reasonable to believe that the increase of birds has in part, at least, paralleled whatever increase of grasshoppers may have been due to the increased food supply furnished by man. But in spite of what the birds have accomplished in the destruction of these insects, they continue to give trouble. Consequently we should not be justified in saying that birds are capable of controlling all grasshopper plagues so as to prevent damage." (p. 13.)

"The average number of grasshoppers, when in normal numbers, per square yard probably does not exceed two or three, and as a rule is probably less. The bird population, though taking but a tenth as many grasshoppers at such a time, would be taking a far greater percentage of the total number of these insects than when taking the numbers found to be consumed during the outbreak. A smaller number of grasshoppers destroyed at the time of minimum numbers has a more important bearing on the prevention of an increase than a larger number destroyed at the time of maximum numbers. We can safely infer, therefore, that the regulative influence of birds is just as important throughout the year as during an insect outbreak, or even more important." (p. 16.) This conclusion agrees with that reached by Professor F. E. L. Beal, from a lifetime's work in economic ornithology. (See Yearbook U. S. Dept. Agr. 1908, pp. 343-350.)

However, Mr. Bryant's researches give proof of what has been questioned by some, namely that birds increase in numbers in areas severely infested by some insect pest, and that they vary their diet to include an abnormal proportion of the over-abundant species. "The investigation showed that the birds in the vicinity of the outbreaks changed their food habits, in that they fed on the insect most available. The fact that meadowlarks neglected their usual percentage of ground beetles and fed almost entirely on grasshoppers can be explained in two ways. Either the grasshoppers were taken in preference, or they were taken because they were the most easily obtained. The large number eaten by the killdeer, and by the Anthony green heron, horned lark, and oriole demonstrates this point, for the recorded food of these birds under other conditions does not show so large a percentage of grasshoppers."

"Undoubtedly birds flocked to the infested areas. Brewer blackbirds were seen flying out from the ranch houses to the infested areas to feed. Large flocks of bicolored red-wings fed almost entirely in the areas where grasshoppers were abundant. A census of birds taken in infested areas,

compared with one taken in a non-infested district, showed birds to be about three times as abundant in the infested areas during hours of feeding." (p. 17.)

"The failure of birds to check an insect outbreak is evident to all. Their success in preventing insects from becoming abnormally abundant is not so apparent but is no less real. All obtainable evidence, however, points to the fact that the regulative influence exerted by birds when insects are to be found in normal numbers, although less apparent, is none the less important, for at such times artificial control measures are seldom used." (p. 19.)

It is upon the comparative value of artificial control and the activities of natural enemies that the reviewer would make a few remarks. There is a deep-seated, and persistent (because founded on love of ease) idea that if natural enemies are only sufficiently encouraged and protected, crop production free from the annoyance of insect pests will be assured. That this is a dream impossible of fulfillment, is evident from the fundamental interrelations of living things. Natural enemies have developed because there was an excess of individuals of certain species that could be destroyed without any permanent decrease in the numbers of the species as a whole. In creatures with annual or shorter generations as is the case with most insects, all but an exceedingly small proportion of the offspring must die without participating in reproduction; the way of their taking off is unimportant, they may as well be eaten, as to starve, dry up or freeze. Whatever happens to the supernumeraries, a small but fecund minority remains, and the average number of the species is about the same from year to year. If there is an excess of individuals, under natural conditions, that satisfies the demands of enemies, without endangering the existence of the species, what an overwhelming excess of a species there must be where we give over acres or hundreds of acres to pure cultures of its favorite food plants. No wonder there are constantly recurring outbreaks with which natural enemies are unable to keep pace even in a relative way.

As the writer has pointed out elsewhere¹ when we consider the degree of insect control necessary to the commercial success of crops, it is evident that man must almost invariably depend upon his own efforts. We must know about natural enemies, give them all due credit, and protect them, but we must beware of exaggerating their services. People are only too easily misled in this direction but the final result of too great faith in natural enemies is disappointment. Let the student of natural economics see therefore that blame for such disappointment cannot justly be laid upon him.—W. L. M.

Some Bird Enemies of Amphipods.—In an interesting paper² covering the general life histories of 4 species of amphipods found about Ithaca,

¹ Yearbook U. S. Dept. Agr., 1911, p. 245.

² Sonderabdruck aus Internat. Rev. d. gesamten Hydrobiologie u. Hydrographie. Biol. Suppl. III, 1911 (1912), 33 pp.

N. Y., Mr. Geo. C. Embody records some original data by J. T. Lloyd and A. A. Allen, relating to the bird enemies of these crustacea. It is stated that amphipods were found in the stomachs of the Virginia rail, sora, red-winged blackbird, swamp sparrow, long-billed marsh wren, spotted sand-piper, and king eider duck. The last named bird contained 72 specimens of *Gammarus fasciatus*. The Biological Survey has identified amphipods in the stomachs of 30 species of birds, including 6 species of shorebirds, and 14 of ducks. Most of the other birds are marsh-frequenters or visitors like those mentioned by Mr. Embody. The list includes: the seaside, sharp-tailed, and song sparrows, catbird, robin, northern butcherbird, common tern, meadowlark, starling and rusty blackbird.

A recent paper¹ by Hartley H. T. Jackson, comments especially on the Shoveller Duck as an enemy of amphipods, and also lists numerous species of fish which prey upon these crustacea.—W. L. M.

Injurious African Birds.—The Fourth Report² of the Wellcome Tropical Research Laboratories contains two articles dealing with damage to grain crops by birds. The first by Harold H. King (p. 98) briefly states the importance of the matter. It is said that in one province, the losses equal one third of the grain harvested, representing a money value of £70,000.

The second article (pp. 157–177) by A. L. Butler is entitled “The finches and weaver birds of the Sudan, being notes on the group containing the birds injurious to grain crops.” The author says “the damage seems to be done entirely by the sparrows (*Passer*) and the extremely abundant weaver birds of the genera *Hyphantornis*, *Xanthophilus*, *Quelea*, and, in a smaller degree, *Pyromelana*.” (p. 157.) Reichenbach’s Weaver (*Hyphantornis tæniopterus*)” appears to be the most abundant weaver in the country, and it congregates in flocks which must, literally, often number millions. Few travellers on the White Nile can have failed to notice the immense flights of these birds, which look at a distance like great drifting clouds of smoke, and which pass overhead with a roar of innumerable wings like the rush of a hurricane. This species and *Quelea æthiopica* are the most destructive birds on the White Nile.” (p. 175.)

Mr. Butler’s paper treats 23 species of finches, 53 of weaver birds, and in a postscript, one lark. The last named damages grain in the unusual way of hovering in the air and picking off single grains, but the birds come in such vast flocks that fully 50 per cent of the grain is sometimes consumed.—W. L. M.

¹ Bull. Wis. Nat. Hist. Soc., Vol. 10, Nos. 1 and 2, June, 1912, pp. 49–60.

² Khartoum, 1911.

The Ornithological Journals.

Bird Lore. Vol. XIV., No. 5. September–October, 1912.

Phoebe vs. Catbird.— A Study in Adaptability. By A. A. Allen.

The Story of Peter, a Purple Martin. By Fanny Hardy Eckstorm.

The Migration of N. A. Sparrows. By W. W. Cooke.— Towhees.

Colorplates by Fuertes and Notes on Plumages by Chapman.

The California Quail and White- and Red-breasted Nuthatches furnish the subjects for the Educational Leaflets, with color plates by Allan Brooks and R. T. Brasher.

Bird Lore. Vol. XIV., No. 6. November–December, 1912.

The Magpies of Culebra Creek [Colorado]. By E. R. Warren.

Our Winter Guests. By Eliza F. Miller.— In Vermont.

A Rustic Food-House. By Frederic H. Kennard.

Gull Pensioners. By E. L. Moseley.— At Sandusky Bay, Ohio. Striking photographs by E. Niebergall.

Tame Wild Turkeys. By W. T. Davis.— In south Florida.

The Migration of N. A. Sparrows. By W. W. Cooke.— Pine Grosbeak. Color plate by Fuertes and plumage notes by Chapman.

The Chickadee by E. H. Forbush and the Willow Ptarmigan by Joseph Grinnell are the Educational Leaflets.

Annual Report of the National Association of Audubon Societies for 1912.

The Condor. Vol XIV, No. 5. September–October, 1912.

The Discovery of the Nest and Eggs of the California Pine Grosbeak. By Milton S. Ray.— A very interesting and well illustrated account of a trip into the high Sierras.

Notes from Todos Santos Islands. By A. B. Howell.— Annotations on 32 species.

Some Birds of the Saw-tooth Mountains, Idaho. By Stanley G. Jewett.— 35 species.

The Wilson Bulletin. No. 80. September, 1912.

A March Bird List from the Caloosahatchee River and Lake Okeechobee. By Frank M. Phelps.— Annotated list of 93 species; illustrations from photographs by O. E. Baynard.

Some Additions to a List of the Winter Birds of Southeastern Michigan. Pt. III. By B. H. Swales.— 18 additional species.

Why Birds are so named. By Katie M. Roads (continued from previous number).— This paper, intended to be instructive, is on the contrary exceedingly misleading and contains numerous errors. The author of the technical name is cited as authority for the English name which he frequently is not, while many of the sentences in quotation marks are not quotations at all. Little attempt has been made to search out the full names of persons after whom birds have been named. This leaves the un-informed reader in much doubt in the case of species named 'townsendi' where two different men have been honored.

A Study of the Avifauna of the Lake Erie Island. By Lynds Jones.— The Birds of Pelee Island, 65 species listed.

The Oölogist. Vol. XXIX, No. 9, September 15, 1912.

A Preliminary List of the Water Birds of the Middle Delaware Valley. By R. F. Miller.— An unfortunate and misleading compilation, though presented as if original. Including a number of species of which there is no record for this region.

The Oölogist. Vol. XXIX, No. 10, October 15, 1912.

Pennsylvania and New Jersey Nesting Dates for 1912. By R. C. Harlow.

Rails. By W. E. Saunders — Discusses their calls.

Summer Residents of Rutherford Co., N. C. By C. F. Moore.

The Pine Siskin. By R. B. Simpson — Nesting in Pennsylvania.

An Orange County [Fla.] Wood Ibis Rookery. By D. J. Nicholson.

The Ibis. IX Series. Vol. VI, No. 24. October, 1912.

The Birds of Gran Canaria. By David A. Bannerman.— The island is divided into six more or less distinct areas, the physical features and bird life of which are discussed, followed by an annotated list of the 84 species known from the island. There is a good map, some admirable half-tones showing the character of the country and a colored plate of *Fringilla teydea polatzeki*.

Notes on *Licmelis pastinator*. By Thomas Carter.— An excellent account of the habits of this interesting Cockatoo which has been rapidly decreasing in numbers. It is very destructive to wheat. On a strip 200 by 30 yards the entire crop was pulled down and trampled flat by the birds.

Remarks on the Stomach-contents of Birds. By C. F. M. Swynnerton.— While stomach contents showed but very few cases of birds devouring butterflies, actual observation directed especially to this question greatly increased the number. Wings and often the head as well were rejected which greatly increased the difficulty of detecting the presence of butterflies in the stomach.

The Progress and Condition of the U. S. National Museum. (From Annual Report).

Further Notes on the Birds of the Island of Formosa. By W. R. Ogilvie-Grant.— Based on the collection made by Mr. Walter Goodfellow in January, 1912. *Pyrrhula arizonica*, and *Ianthia goodfellowi* are described as new, the latter being figured in colors as well as *Dicaeum formosum* and *Parus ater ptilosus*.

On the Immature Dress of *Anser indicus* and *Dendrocygna arborea*. By F. E. Blaauw.

The Shoe-bill in the Regent's Park.— By P. L. S. With an illustration of one of those living in the Giza Zoölogical Gardens.

Bulletin of the British Ornithologists' Club, CLXXXI.— Dr. Hartert describes as new *Phyllergates cucullatus batjanensis*, Batjan, Northern Moluccas; *Stoparola panayensis obiensis*, Obi Major; *Cossypha somereni*, Kampala, Uganda.

Mr. Erwin Stresemann who had been on the second 'Freiburger Moluk-

ken Expedition,' described the following new forms; *Leucopsar* (gen. nov.) *rothschildi*, Island of Bali; *Turdus deningeri*; *Oreosterops pinaia*, and *Stigmatops monticola*, Middle Ceram; and *S. deningeri*, Buru.

A new pheasant (*Pucrasia joretiana*) was described by Rev. J. Courtois from the mountains of the province of Anhwi, China.

Mr. F. W. Smalley described the moults of the Old Squaw Duck (*Harelda hyemalis*).

Bulletin of the British Ornithologists' Club, Vol. XXX.— November, 1912. This volume of 332 pages constitutes the seventh annual 'Report on the Immigrations of Summer Residents' in England and Wales, covering the spring of 1911 and autumn of 1910. It follows the plan of the preceding reports and contains an immense amount of data. It might be remarked that while lighthouse records are definite and positive, the records of 'increase' for inland points would seem from our experience in America to be of questionable value owing to the extent to which personal opinion is involved.

The Avicultural Magazine. Vol. III, No. 11. September, 1912.

Nesting of the Black Redstart. By W. E. Teschemaker (concluded in October).

The Paradise Flycatcher. By E. C. Stuart Baker.

The Whooping Crane. By R. Cosgrave—An excellent half-tone illustration from life.

The Avicultural Magazine. Vol. III. No. 12. October, 1912.

The Two Nonpareils. *Cyanospiza ciris* and *Erythrura prasina*. By Frank Finn—With illustration in colors.

Cranes. By R. Cosgrave.—Illustrations of Little Brown and Wattled Cranes with Hybrid young, and young and old Demoiselles.

The Avicultural Magazine. Vol. IV, No. 1. November, 1912.

The Ring-necked Teal. *Nettion torquatum*. By D. Seth-Smith. Colored plate.

Nesting of the Winchat. By W. E. Teschemaker.

British Birds. Vol. VI. No. 4. September 2, 1912.

Spring-notes on the Border Counties. By Abel Chapman. Several original illustrations of ducks and grebe. By the author.

Observations on Manx Shearwaters and Storm-petrels at the Sally Isles. By Norman H. Joy.

British Birds. Vol. VI. No. 5. October 1, 1912.

Notes on the Bearded Tit. By Miss E. L. Turner. Illustrated.

Hybrids between Black Game and Pheasant. By Rev. F. C. R. Jourdain.

Emberiza palustris tshusii Reiser and Almsy, new to the British Isles, was taken by J. B. Nichols in Sussex.

British Birds. Vol. VI, No. 6. November 1, 1912.

Some Notes on the Breeding Habits of Nightingales. By N. F. Ticehurst. Illustrated by admirable half-tones from photographs.

The 'British Birds' Marking Scheme. Progress for 1912 and Some Results. By H. F. Witherby. 31,980 birds 'ringed' in four years.

Messrs. L. J. Rintoul and E. V. Baxter obtained the Lapland Blue Throat, new to the British Isles, on Isle of May.

Baird's Sandpiper was obtained at Rige Harbor, Sussex, Sept. 16, 1912.

The Austral Avian Record. Vol. I, No. 4. September 18, 1912. Additions and Corrections to My Reference List to the Birds of Australia. By Gregory M. Mathews.— 61 new subspecies.

On the Generic Name of the Barn Owl. By Gregory M. Mathews.—

Attention is called to the genus *Flammea* Fournel, Fauna de la Moselle, 1836, which is available if *Tyto* Billberg, 1828, is regarded as invalidated by the earlier *Tyto* of the same author.

The Emu. Vol. XII. Part 2. October, 1912.

Haunts of the Spotted Bower-Bird (*Chlamydodera maculata* Gld.). By Sidney Wm. Jackson.— A very interesting paper of 40 pages describing in the form of a daily diary a trip to Cambo Cambo, 500 miles northwest of Sydney, N. S. W., for the purpose of studying the habits and nidification of the Bower-Bird and other species. Admirable illustrations of the playgrounds and nests are presented as well as one of the nest of *Pseudogerygone jacksoni*, which was discovered on this trip. One of the playgrounds figured contained bleached bones of sheep, toe-bones of the Emu, pieces of glass, iron and tin nails, buttons, screws, washers, bottle-necks, small stones, pieces of Emu eggshell, pods, berries and a cartridge case. Mr. Jackson's entomological forceps and an aluminum teaspoon from his camp were soon added to the collection!

Internal Parasites Recorded from Australian Birds. By T. Harvey Johnston.

Birds of Lake Boga, Victoria. By A. Chas. Stone.— An annotated list of 162 species observed during a residence of eighteen years.

Field Ornithology in South Australia. By S. A. White. Covers the Port Augusta district.

Notes on the Mistletoe Bird (*Dicaeum hirundinaceum*). By L. G. Chandler.

Notes and correspondence indicate that Mr. Gregory Mathews' recent publications are bringing the Australian ornithologists violently face to face with the subspecies question — a problem which became familiar to Americans nearly a generation ago but which is apparently not yet settled to everyone's satisfaction.

Ornithologische Monatsberichte. September, 1912.

On the Mating Activities of the House Sparrow. J. Gengler.

Ornithological Observations on a Visit to Gratz Park. Fritz Braum.

Ornithology of North Palestine. Ernest Schmitz.

Are male birds in the Majority? O. Heinroth.

Ornithologische Monatsberichte. October, 1912

New Species of Birds from Amazonia. E. Sneath.— *Myrmotherula sclateri*, *Picumnus vargae*, and *Momotus momota cametensis* spp. nov.

On a new species of Dwarf Owl from Java. O. Finsch.— *Pisorhina angelinae*, sp. nov.

Two interesting breeding-birds for Lubeck. Werner Hagen.—*Ardetta minuta* and *Emberiza hortulana*.

Some Nomenclatural Remarks on Picidæ. Erich Hesse.—*Dendrocopos* Koch and *Dendrocopos* Vieill. are regarded as different names, and consequently Koch's genus should not be replaced by *Dryobates* Boie. Hartert's treatment of *Picus canus biedermanni* Hesse and *Picus gorii* (Harg.) is also discussed.

Phylloscopus indicus albigula subsp. nov. Erich Hesse.

J. Thienemann records a pair of Swifts banded in 1910 which returned to the same nest box in Neustrelitz, Mecklenburg, in both 1911 and 1912.

Journal für Ornithologie. October, 1912.

A Contribution to the Ornithology of southeastern German East Africa. Hermann Grote. The first installment of an annotated list, containing 146 species. *Gullera cristata makondorum* subsp. nov.

From Suez to St. Katharine's Closter. O. Graf Zedlitz.—Second installment. *Ammomanes deserti katharinæ* subsp. nov.

On the Klein bird drawings. J. Gengler.

Remarks on some Persian birds. N. Sarudny and M. Härms.—*Passer yatii* Sharpe, *Cinnyris brevirostris* (Blauf) and *Pycnonotus leucotis* (Gould) treated in great detail.

Obituary of Wilhelm Blasius. A. Nehr Korn.

Discussion of Koenig's 'Avifauna Spitzbergenensis.'

Ornithologische Monatschrift. Vol. 37, No. 8.

Fourth Annual Report of the Reservation for Bird Protection at Subach. By Baron Hans von Berlepsch.

Verhandlungen der Ornithologischen Gesellschaft in Bayern.

XI. No. 2. July 1, 1912.

Dr. J. Gengler discusses Andreas Jäckels 'weihergegend' then and now.

Baron Besserer reports on Gull-banding during 1911.

Revue Francaise d'Ornithologie, IV, Nos. 41-42, September-October, 1912.

Revue of the Genus *Gracula*. By Dr. A. Dubois.

On the Food of Certain Birds. By Viscount de Chaignon.

Ornithological Notes from Tunis. By Dr. Millet-Horsin.

Spring Migration at Charente. By J. Delamain.

Revue Francaise d'Ornithologie. IV, No. 43, November, 1912.

Study of a Collection of Birds made by M. Reinburg, in the environs of Baños Haut Pastaza, Ecuador. By A. Menegaux. Eighty-nine species of which *Picolaptes warszewiezi aquatorialis* is described as new.

The Black-eared and Black-throated Chats. By Collingwood Ingham.—Recognizes two races of the former and three of the latter.

An Authentic Catalogue of Birds Observed in the District of Montlucon [France]. By R. Villatte de Prugnes.

Ornithological Articles in Other Journals.

Criddle, N. The Upland Plover. (The Ottawa Naturalist, Aug.-Sept., 1912.)

Brown, W. J. Unusual Nesting Site of the Pigeon Hawk in Newfoundland.—On the ground. (The Ottawa Naturalist, Aug.-Sept., 1912.)

Brown, W. J. Additional Notes on the Birds of Newfoundland. (The Ottawa Naturalist, November, 1912.)

Saunders, W. E. Harris' Sparrow in Ontario. (The Ottawa Naturalist, November, 1912.)

Selous, E. An Observational Diary on the Domestic Habits of the Carrion Crow (*Corvus corone*). (The Zoölogist, No. 855, September 15, 1912.)

Coburn, F. Blue-winged Teal (*Querquedula discors*). Breeding in North Iceland. (The Zoölogist, No. 855, September 15, 1912.)

Harvie-Brown, J. A. The Fulmar: Its Past and Present Status in the North Atlantic and in the Northern Parts of Europe and North America. and Some Account of its Great Increase in Great Britain (The Zoölogist, No. 856-7, October 15,-November 15, 1912).—Supplementary to the article in the Scottish Naturalist, May-June, 1912.

Editorial. The New Nomenclature of British Birds. (Scottish Naturalist, September, 1912).—It would appear from this criticism that the Hand-List of Mr. Hartert and his associates is unfortunately not universally acceptable!

Clarke, Wm. Eagle. On a Case of Hybridism between an Eider and a Wild Duck. (The Scottish Naturalist, September, 1912.)—With an illustration from a photograph.

Thomson, A. L. Aberdeen University Bird Migration Inquiry (1909-12) *continued*. (The Scottish Naturalist, October and November, 1912.)

Stone, W. A New Synallaxis (*S. gularis pichinchæ*, Ecuador). (Proc. Acad. Nat. Sci. Phila., September 6, 1912.)

Huxley, J. S. The Great Crested Grebe and the Idea of Secondary Sexual Characters. (Science, November 1, 1912).—Structures used only in courtship are now the property of both sexes and are used by both in display.

Collins, H. L. Disappearance of the Wild Pigeon. (Forest and Stream, August 24, 1912.)

Editorial. A Vast Wildfowl Refuge. (Forest and Stream, October 12, 1912.)

Publications Received. **Barbour, Thomas.** A Contribution to the Zoögeography of the East Indian Islands. (Memoirs of the Mus. Comp. Zoöl., Vol. XLIV, No. 1, November, 1912.)

Beal, F. E. L. Food of our More Important Flycatchers. (Bull. 44, Biol. Survey U. S. Dept. of Agriculture, September 19, 1912.)

Beal, F. E. L., and McAtee, W. L. Food of Some Well-known Birds of Forest, Farm, and Garden. U. S. Dept. of Agriculture, Farmer's Bull. 506. September 25, 1912.

Bickerton, W. The Home-life of the Terns. Witherby & Co., 326. High Holborn, London. 1912. 6s. net.

Bryant, Harold C. Birds in Relation to a Grasshopper Outbreak in California. (Univ. of Cal. Publ. in Zoölogy, Vol. 11, No. 1, November 1, 1912.)

Forbush, Edward Howe. A History of the Game Birds, Wild-Fowl and Shore Birds of Massachusetts and Adjacent States. Issued by the Massachusetts State Board of Agriculture. 1912.

Gabrielson, Ira N. A Study of the Home Life of the Brown Thrasher, *Toxostoma rufum* (Linn.). (Wilson Bull., June, 1912.)

Galsworthy, John. For Love of Beasts. (Pall Mall Gazette, 1912. Repaged.)

Hellmayr, C. E. Bemerkungen über eine wenig bekannte, neotropische Ammer (*Zonotrichia strigiceps* Gould). (Verhandl. der Ornith. Gesellschaft in Bayern XI, 2. July, 1912.)

Horsbrugh, Major Boyd. The Game Birds and Water-Fowl of South Africa. Part 3. Witherby & Co., High Holborn, London. September 30, 1912.

Mathews, Gregory M. The Birds of Australia. Vol. II, parts 3 and 4. Witherby & Co., High Holburn, London. September 20, and November 1, 1912.

Miller, W. deW. A Revision of the Classification of the Kingfishers. (Bull. Amer. Mus. Nat. Hist., XXXI, September 12, 1912.)

Nelson, E. W. Descriptions of New Genera, Species and Subspecies of Birds from Panama, Colombia and Ecuador. (Smithson. Misc. Collns., 60. No. 3., September 24 [=27], 1912.)

Oberholser, H. C. Descriptions of One Hundred and Four New Species and Subspecies of Birds from the Barussan Islands and Sumatra. (Smithson. Misc. Collns., 60, No. 7, October 26, 1912.)

Palmer, T. S. National Reservations for the Protection of Wild Life. (Circular 87, Biol. Survey, U. S. Dept. of Agriculture, Oct. 5, 1912.)

Reed, Chester A. Birds of Eastern North America. Doubleday, Page & Co. Garden City, N. Y.

Shelley, G. E. The Birds of Africa. Vol. V, Part II, completed and edited by W. L. Selater. Henry Sotheran & Co., 43 Piccadilly, London. 1912.

Shufeldt, R. W. American Ducks and How to Distinguish them. Pts. VIII-X. (Outer's Book, October-November, 1912.)

Stone, W. A New Synallaxis. (Proc. Acad. Nat. Sci. Phila., 1912. September 6.)

Stone, W. The Phylogenetic Value of Color Characters in Birds. (Jour. Acad. Nat. Sci., Phila., XV, November 22 [= Dec. 4], 1912.)

Strong, R. M. Some Ideas on Teaching a Bird Course. (Nature Study Review, Vol. 8, No. 5, repaged.)

Trotter, Spencer. The Faunal Divisions of Eastern North America in Relation to Vegetation. (Jour. Acad. Nat. Sci. Phila., XV, September 7, 1912.)

- Abstract** Proc. Zool. Soc. London, Nos. 112, 113 October 29, November 12, 1912.
- Animal's Friend**, The. XVIII, Nos. 9-12; XIX, No. 1, June-October, 1912.
- Austral Avian Record**, I, no. 4, September 18, 1912.
- Avicultural Magazine** (3) III, No. 12, IV, No. 1, October-November, 1912.
- Bird-Lore**, XIV, Nos. 5 and 6, September-December, 1912.
- British Birds**, VI, Nos. 4-6, September-November, 1912.
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- Bulletin** Charleston Museum, VIII, No. 6, October, 1912.
- Condor**, The, XIV, No. 5, September-October, 1912.
- Emu**, The, XII, Part 2, October, 1912.
- Forest and Stream**, LXXIX, Nos. 13-26, 1912.
- Ibis**, The, (9) VI, No. 24, October, 1912.
- Oölogist**, The, XXIX, Nos. 10-11, October, December, 1912.
- Ornithologische Monatschrift**, 37, Nos. 9-10, September-October, 1912.
- Ottawa Naturalist**, The, XXVI, Nos. 5-8, August-November, 1912.
- Philippine Journal of Science**, VII, No. 3 and Memorial Number, June-July, 1912.
- Proceedings** of the Acad. Nat. Sci. Philadelphia, LXIV, Part II, April-August, 1912.
- Proceedings** and Transactions. Nova Scotia Inst. Sci., XIII, Part 2, August 26, 1912.
- Revue Française d'Ornithologie**, IV, Nos. 41-43, September to November, 1912.
- Science**, N. S., XXXVI, Nos. 926-939.
- Scottish**, Naturalist, The, 1912, Nos. 10-11, October-November, 1912.
- Wilson Bulletin**, The, XXIV, No. 3, September, 1912.
- Zoölogist**, The, (4), XVI, Nos. 189-191, September-November, 1912.

CORRESPONDENCE.

The Concealing Coloration Question.

TO THE EDITOR OF 'THE AUK':

Dear Sir: I have read the paper on 'The Concealing Coloration Question,' by Francis H. Allen, which appeared in your October issue. While I am not prepared to offer any criticism on the merits of this paper, for or against, I do protest against articles appearing in the pages of 'The Auk' which bear such a smack of personality. Such papers only invite others of like nature, and often result in taking up too much valuable space.

Very truly yours,

RUTHVEN DEANE.

Chicago, Ill.,

December 2, 1912.

[In reply to the above and the following letters of criticism the editor desires to express his regret that any remarks objectionably personal should, through his oversight, have appeared in the pages of 'The Auk.' He found himself so strongly in sympathy with the position taken by Mr. Roosevelt and Drs. Barbour and Phillips in this discussion, that he hesitated unduly to exercise his editorial function for fear of being unfair to the other side. Consequently some statements in the paper referred to were allowed to stand, which the author should have been asked to correct and alter. 'Misquotations' and 'pieces of faulty reasoning' (p. 492) should have been clearly differentiated, for while 'misquotation' is a serious charge, 'faulty reasoning' may be faulty only in the opinion of the critic. In other words it is a matter of personal opinion. Furthermore, the two examples of alleged misquotation that are cited cannot be so regarded if the entire statements of Mr. Thayer and Mr. Roosevelt are taken into consideration. Mr. Roosevelt was in the first instance not quoting Mr. Thayer verbatim regarding the crouching hare, and merely put in quotation marks some of Mr. Thayer's expressions. What Mr. Roosevelt was pointing out was that in one statement Mr. Thayer regards the running hare as obliterated in the sight of creeping animals, which have their eyes below the level of the hare's tail, while in another statement he regards the crouching hare as boldly conspicuous in the sight of the same class of animals, and this is surely what Mr. Thayer says.

In the other case it is charged that Mr. Roosevelt has misread Mr. Thayer when he quotes him as saying that an *animal escapes observation, not because it sits motionless like a stump or clod or some such inanimate thing but purely because of its shading which he says is rendered oblitative by the countergradation of shades.*¹ Here Mr. Roosevelt used no quotation marks

¹ Italicized portion quoted verbatim from Mr. Roosevelt's paper (italics mine).

and was simply presenting Mr. Thayer's views as concisely as possible. What Mr. Thayer says is as follows: *The reader . . . is now in a position to perceive the fallacy of the statement prevalent in former years and still made by certain writers, that a protectively colored animal of the type described above escapes detection because being of a dull brown color like the ground and the bushes, it looks when it sits motionless like a clod or a stump or some such inanimate thing. . . . The protectively colored animal, on the other hand, is as it were obliterated by its countergradation of shades. . . . If these animals were merely brown or gray like clods or stumps they would not be concealed, because their structural forms are too distinct, and the eyes of enemies are keen to detect their characteristic modelling and outlines. On the other hand, a perfect shade gradation, even of some rankly brilliant color would go far toward concealing an animal.*¹

Mr. Roosevelt can surely not be charged with misquotation here! Mr. Allen was probably contrasting his remarks with p. 15 of Mr. Thayer's book instead of with p. 19.

There are other quotations the significance of which would be materially changed if the entire paragraph or correlative matter elsewhere were considered. Indeed in a complicated discussion such as this it is quite possible to quote apparently contradictory statements from different parts of the same paper. The editor repeats his regret that through his oversight statements like the above were allowed to pass uncorrected.

WITMER STONE.]

The Scientific Value of Bird Photographs.

TO THE EDITOR OF 'THE AUK':

Dear Sir: In selecting as the major title of his paper in 'The Auk' for October (Vol. XXIX, pp. 489-507) 'Roosevelt vs. Thayer. . . .' rather than *Revealing vs. Concealing Coloration*, Mr. Francis H. Allen evidently betrays his mental attitude toward a controversy to which his article is contributed.

Fair-minded, critical discussion of any subject tends to advance our understanding of it, but criticism which is unpleasantly personal, even discourteous in tone, which accuses a writer of misquoting, misrepresenting and perverting, of being dogmatic, ignorant, and grossly careless, obscures the main issues and for this, as well as for other reasons, is to be deplored. Particularly is this true when the criticism is not only unwarranted, but when the critic himself appears to be in error.

To illustrate Mr. Roosevelt's "inaccurate habit of mind and slap-dash style of thinking" Mr. Allen (*l. c.*, p. 492) challenges Mr. Roosevelt's reference² to photographs of certain birds as illustrating their conspicuousness in nature, and writes that Mr. Roosevelt quite overlooks "the obvious facts

¹ Italicized sentences quoted verbatim from Mr. Thayer's book (italics mine).

² *Bull. Am. Mus. Nat. Hist.*, Vol. XXX, 1911, pp. 156; 220.

that the photographers naturally chose the conspicuous subjects, avoiding those that were at all obscured and getting their cameras into positions where the birds would come out most clearly, and thus made the birds as conspicuous as they possibly could, which was the end and aim of their work. I take it that the birds in most photographs do not appear at all as they would under average conditions in their natural surroundings."

In making this statement Mr. Allen not only does not fairly represent the views that Mr. Roosevelt expressed in the paper referred to, but he incidentally discredits the work of the bird photographer. No better answer to his criticism of Mr. Roosevelt's views can be found than in the very paper in which they are presented, and I write in this connection mainly in the defence of the field ornithologist who records some of his studies with a camera.

No doubt many bird photographs are made with the object of displaying their subject to the best advantage, but it does not follow that for this reason most bird photographs are lacking in scientific value, or that they do not faithfully portray nature. On the contrary, and replying in detail to Mr. Allen's disparaging estimate of photographs of birds in nature, I maintain, on the basis of the photographs contained in the works cited by Mr. Roosevelt, (1) that the photographer does *not* avoid subjects that "are at all obscured" (witness so-called puzzle pictures of Grouse, Woodcock, Whip-poor-will, etc.), (2) that he does *not* always make the bird as "conspicuous" as possible, (3) that to make birds conspicuous is *not* "the end and aim" of bird photography, and (4) that many bird photographs *do* represent birds as they appear "in their natural surroundings."

In his apparent eagerness, however, to convict Mr. Roosevelt of a "slap-dash style of thinking," and, as a side issue, the bird photographer of misrepresenting his subject, Mr. Allen fails to call attention to the fact that while Mr. Roosevelt mentions certain photographs to show that the birds portrayed are revealingly colored, so Mr. Thayer publishes the photographs of others to prove that they are concealingly colored! Thus Mr. Roosevelt refers to photographs of Black Skimmers, Gannets, Guillemots, Ibises, Cormorants, Egrets, Anhingas, Pelicans, and other birds which *are* conspicuous in nature as well as in photographs; while Mr. Thayer publishes¹ photographs (all taken by others) of the Virginia Rail, American Bittern, Woodcock, Wilson's Snipe, Upland Plover, Ruffed Grouse, Ptarmigan, Bob-white, Whip-poor-will, Nighthawk and other protectively colored birds to show that they are protectively colored.

In passing, it is well to note that while Mr. Roosevelt freely admits that the birds just mentioned, and of which Mr. Thayer publishes photographs, *are* protectively colored, Mr. Thayer does *not* admit that *any* bird is revealingly colored. In any event, I venture to claim that both writers demonstrate the scientific value of the properly made bird photograph, whether it be used as evidence to prove conspicuousness or inconspicuousness.

¹ 'Concealing Coloration in the Animal Kingdom.'

So much for this particular case from the bird photographer's point of view; as a more general comment on Mr. Allen's condemnation of Mr. Roosevelt's "inaccurate habit of mind," it will be sufficient to quote, as above suggested, the passages which Mr. Allen instances in support of his accusation. The first occurs on page 156 of the paper referred to, where, in a foot-note, Mr. Roosevelt says:

"Mr. Job's photographs of nesting nighthawks, whip-poor-wills, grouse, quail, woodcock, snipe, and least sandpipers show birds that actually are concealed by their coloration when on their nests. His photographs of nesting gannets, murrees, guillemots, black skimmers, ibises, noddies and pelicans, and his and Mr. Finley's photographs of nesting gulls, terns and herons of many species show birds of a strikingly advertising coloration which coloration reveals them to every onlooker as they sit on their nests. The young herons, although not as advertisingly colored as the adults, have a revealing rather than a concealing coloration; the young anhingas are even more advertisingly colored than the adults; the young of some of the other birds seem to be concealingly colored."

The second passage, appears on page 220 of the same paper. Here Mr. Roosevelt writes:

"Take for example the descriptions and photographs of waterbirds by Messrs. Chapman and Job; no one can look at the photos of the black skimmer and stilt on their nests without seeing that even in that critical position their coloration is highly advertising, while the coloration of their young is concealing; no one can look at the photographs of the nesting egrets, anhingas, cormorants and pelicans without seeing that both the adults and the young are exceedingly conspicuous, without a vestige of concealing coloration; no one can look at the photographs of the nesting woodcock, nighthawk, Wilson's snipe, bob-white, and upland plover without seeing that they possess a concealing coloration."

Perhaps the reader can discover in these quotations some evidence of an "inaccurate habit of mind and slap-dash style of thinking," but I confess that I have been unable to do so. To my mind Mr. Allen's whole argument is here based on his assumption that photographs of birds in nature do not represent the birds as they would appear "under average conditions in their natural surroundings," an assumption which I believe will not be supported by an unprejudiced consideration of the recorded evidence.

Very truly yours,

FRANK M. CHAPMAN.

American Museum of Natural History,
Dec. 10, 1912.

The A. O. U. Check-List.
Third Edition.

EDITOR OF 'THE AUK':

Dear Sir: — I beg to submit herewith some comments which I presented before the last meeting of the A. O. U. in regard to the third edition of the Check-List of North American Birds.

It was with eager interest that somewhat over a year ago I opened this volume for the first time, for, although it was my personal opinion that our knowledge of North American subspecies was not nearly complete enough for the preparation of a List that would be in any way permanent I knew that earnest, conscientious work had been done on it by able men, and I was delighted to see the result of their labors. My first impressions were altogether favorable. I liked the general arrangement, the manner in which subspecies were grouped under species and the range given for each, and the statement of the locality from which the type came. The geographical ranges seemed wonderfully complete and I found the accents a correction to many unconscious errors in pronunciation. I was pleased to find the old order retained for its convenience, and to read in the Preface the brave confession of ignorance as to a true classification; for, while such an eminent avian anatomist as Pycraft holds that the earliest birds were small and arboreal, how can we hope to prepare at present a correct phylogenetic tree, since early avian fossils are few and among them we find such specialized large and flightless birds as *Hesperornis* in the Cretaceous and *Gastornis* in the Lower Eocene? So I felt we had an altogether excellent work, which would long be the standard, and for which the Committee of the Union could not receive too much praise.

But as I began the actual use of the book in ornithological work I ran into strange anomalies and omissions that led me to suspect that though the head was undoubtedly gold baser metal might be found elsewhere. And as I read the Sixteenth Supplement, published in 'The Auk' for last July, I was still more puzzled by rulings that seemed strange, and sometimes totally inconsistent with the body of the work. For, having disclaimed responsibility for the classification and given due credit for the geographical distribution, the Committee certainly must be held responsible for the standing of all the species and subspecies recognized in this new edition. In the annual supplement, the authors can be held liable only for the changes made or rejected therein, but certainly state their belief in the correctness of the new edition as a whole by printing it over their signatures.

Musing on these matters as I turned the pages of 'The Auk,' I came to the interesting editorial which requested, it seemed to me, loyalty by the Union to the decisions of the Committee. In the value of loyalty I heartily agree, for without recognition of authority there can be no stability in nomenclature or anything else. But to whom should we be loyal! That was my first thought; for, I confess, the names of the Committee had left my memory. At the head of the article referred to I found them — the foremost American ornithologists, men who have done and are doing immensely valuable work, and to whose opinion on all questions strictly of nomenclature and classification we naturally bow. But is their judgment infallible regarding the recognition of new subspecies? Only two have done much work in this direction within recent years, and of these one is notoriously indifferent to the decisions of the Committee. As the others are certainly competent to do work of this kind, and as most of them have

an abundance of material at their disposal, I am forced to the conclusion that either they are indifferent to the subject or believe that all North American subspecies of value have already been recognized. Neither of these standpoints, I think it must be admitted, is one likely to result in a favorable attitude toward proposed subspecies, though the intention to be just to all cannot be questioned.

Loyalty to ideals or a cause is certainly noble in a nation or an individual, but it must be founded on reason and judgment else it may degenerate to mere servility, and I find many points in both Check-List and Supplement that fail to commend themselves to me. That the recognition of subspecies is of great value anyone who has read Eagle-Clarkes 'Studies in Bird Migration' will readily admit. That their recognition must be partly at least a matter of opinion, and that the Committee often have more material than the original describer is no doubt also true; still I totally fail to see why such a bird as *Creciscus coturniculus* is recognized as a full species and *Dryobates scalaris symplectus* not thought even subspecifically distinct from *Dryobates scalaris cactophilus*; why *Phalacrocorax pelagicus robustus* and *resplendens*, *Dryobates villosus leucomelas* and *auduboni*, *Dryobates pubescens medianus* and *nelsoni*, *Molothrus ater obscurus* and *Ammodramus savannarum floridanus* are considered good subspecies and the characters given for *Molothrus ater artemisiæ* deemed 'too slight.' In the Anatidæ we find *Olor* recognized as a genus on a difference in feathering at the bill that occurs only in the young, and *Charitonetta* on differences of even slighter value, while *Aristonetta*, *Erionetta*, *Melanitta* and *Pelionetta*, in which differences in the facial feathering or shape of bill persist through life, are called subgenera.

Nowhere can I find any reference to *Anas platyrhynchos grælandica* — a good subspecies and a valuable one, as in range and characters it is somewhat intermediate between the Mallard and Black Duck. From the fact that the Mallard is given only a binomial name I should infer that *A. p. grælandica* was not considered good, were it not for the fact that I find such European stragglers to our shores as *Corvus frugilegus*, *Corvus cornix*, *Sturnus vulgaris*, *Hirundo rustica*, *Chelidonaria urbica* and *Motacilla alba* also given only binomial names, in spite of the fact that subspecies of each are recognized by European ornithologists. That the Committee meant they did not recognize these subspecies, or that, the actual specimens on which the American records were made not being in evidence, they felt themselves unable to determine definitely the proper subspecies was my first impression, though nothing on this point can I find in the book; but by study of the 'Ranges' I discovered the Committee considered the so-called subspecies of these birds were really independent species. For the ranges of *Corvus cornix*, *Corvus frugilegus*, *Sturnus vulgaris* and *Chelidonaria urbica* as given in the Check-List practically coincide with the ranges of the subspecies *C. f. frugilegus*, *S. v. vulgaris* and *C. u. urbica* as given by Hartert, while with *Hirundo rustica* and *Motacilla alba* the ranges include that of *H. r. rustica* and *M. a. alba* with one or more additional races. In the

Check-List the range of *Penthestes cinctus* is given in the Old World as Siberia from the Yenesei River east, while this region is occupied by *P. c. oblectus* according to Hartert, *P. c. cinctus* ranging from northern Scandinavia to western Siberia. *Acanthopneuste borealis* ranges from northern Norway to Kamchatka, while by the Check-List it is confined to "Western Alaska" — a range given by Ridgway for the non-accepted *A. b. kennicotti*, although we find 'Kennicott's Willow Warbler' as the English name of the bird. On the whole for these species the Committee seem to have followed Sharpe in his Hand-List, and Sharpe was a steadfast binomialist. So we find them believing in binomials as far as European species are concerned and trinomials for American. Yet while these birds are treated with binomials we find another straggler to our shores admitted in the Sixteenth Supplement with a trinomial appellation — *Calliope calliope camtschakensis*, a form which even such an arch 'splitter' as Hartert deems unworthy of recognition.

Seeking to comprehend just where the Committee stood I turned next to American species that are only stragglers within one borders. Of the species *Spinus notatus*, *Tiaris bicolor*, *Petrochelidon fulva* and *Ceryle torquata* subspecies are generally recognized but they appear as binomials in the Check-List, while with the first three the ranges as given in the Check-List coincide with those given by Ridgway for *S. n. notatus*, *T. b. bicolor*, *P. f. fulva*, and with *C. torquata* the range includes that of the continental form or forms, *C. t. stictipennis* of the West Indies being, apparently, considered a species, which it may well be.

All this led me to study the geographical distribution more closely with the following result. I found that Connecticut had been omitted from the ranges of *Haliaeetus leucocephalus alascanus*, *Otocoris alpestris hoyti*, *Agelaius phœniceus fortis*, *Acanthis hornemanni exilipes*, *Acanthis linaria rostrata*, *Seiurus noreboracensis notabilis* and *Hylocichla fuscescens salicicola*, and that *Aluco pratincola* was not known to breed nor *Passerherbulus maritimus maritimus* and *Dumetella carolinensis* to winter there; that the Magdalen Islands were omitted from the range of *Hydrochelidon nigra surinamensis* and *Spizella pusilla pusilla*, and Massachusetts and California from that of *Arenaria interpres interpres*; that *Macrorhamphus griseus griseus* was not known to winter in South Carolina or Texas nor *Catoptrophorus semipalmatus semipalmatus* to yet breed in Nova Scotia; that *Helodromas solitarius solitarius* was not known to occur in British Columbia nor *Egialitis meloda* to breed in North Carolina; that *Empidonax wrighti* did not occur in Yukon Territory nor *Dendroica pensylvanica* in California that *Butorides virescens virescens* and *Buteo borealis harlani* were unknown in North Dakota and that *Vermivora celata celata* was not there in the breeding season. To find these omissions it was not necessary for me to search through literature, as specimens of practically all these birds are in my own collection and were chiefly obtained by myself during the past thirty years of field-work. Many of these records have appeared in print and those that have not were at the disposal of the Committee, if they had wished

them. If every field-ornithologist can find as many errors in the 'Ranges' I fear that part of the Check-List must be acknowledged to be very incomplete. The only one with whom I have corresponded on the subject, a man of long and intensive field experience and most careful and reliable in his work, writes that very many of the records which he published in 'The Auk' long ago were absolutely disregarded.

One more point and I am done. The European traveler to this country might feel himself quite at home with a portion of the avifauna of our eastern towns till he turned to the Check-List. Then he would find that *Sturnus vulgaris*, entering the Check-List through Greenland, had been introduced and spread rapidly through New England and the Middle States, but that *Passer domesticus* was not recognized as existing, and might think he had made a discovery or was wrong in his identification until he learned that our 'Manuals' and 'Local Lists' told quite another story. This seems to me an unfair discrimination in favor of our later assisted immigrant.

LOUIS B. BISHOP.

New Haven, Conn., November 18, 1912.

[The A. O. U. Committee as well as the membership of the Union should welcome a critical review of the Check-List by someone outside of the Committee or those who were associated with it; and that such an able and conscientious critic as Dr. Bishop can find no more serious faults than those he has set forth, after two years' study of the volume, is a matter for congratulation.

His criticisms fall under three heads:

1. The ever debatable question of which subspecies and genera shall be recognized and which shall not. This matter was so fully discussed by Mr. Joseph Grinnell and the writer in the October number of 'The Auk' that it seems scarcely worth while to revert to it. One point however, should be made clear. Never so far as known to the writer has the Committee of its own initiative opened cases for reconsideration, even when getting out a new edition of the Check-List. The province of the Committee has always been to pass judgment on changes or new forms proposed in published articles, and in authorizing a new edition of the Check-List the Union did not request or expect a revision of the forms already accepted unless their status had been questioned. If Dr. Bishop will formally state his reasons for the rejection of the subspecies to which he seems to take exception the Committee will I know reconsider the question of their recognition.

2. Dr. Bishop criticises the treatment of the English Sparrow and Starling, and of European and Asiatic stragglers which have from time to time occurred within the limits of the Check-List or which occur more or less regularly in Greenland. Here his criticism is well founded. As he correctly states, the specimens upon which the records of the exotic birds were based are, in the majority of cases, not available, and either this fact

should have been stated in the Check-List, or the treatment made uniform throughout. The ranges likewise should have been those of the *species* where the binomial is used. These discrepancies are however, not very serious in the case of these exotic species which some think have no place at all in the main text of the Check-List.

3. As regards geographical distribution Dr. Bishop seems to be just a little hypercritical. The writer undertook the preliminary revision of the ranges and was forced to limit his compilation to such works as Ridgway's 'Birds of North and Middle America,' Chapman's and Mrs. Bailey's 'Handbooks,' Bishop's list in 'The Water Fowl Family' and the latest state lists. The Index to 'The Auk' was not published at the time this work was done, and to have attempted any further research in the time at his disposal would have been impossible. Subsequently, as explained in the preface to the Check-List, Dr. Merriam and his assistants on the Biological Survey revised the ranges with the aid of the extensive records of the Survey. The fact that the writer was engaged upon this work was noticed in 'The Auk' and considerable unpublished data was submitted to him, all of which was utilized. It seems hardly fair however, to charge the Committee with failing to use unpublished material in the possession of individuals, or to search out every record of the casual occurrence of a species. Some at least of the records Dr. Bishop mentions were not published until after the Check-List appeared and the Alaskan Bald Eagle was not even shot until the Check-List was almost entirely in type!

However, it would be an admirable thing if Dr. Bishop's criticism should induce some ornithologist in each State to carefully study the ranges as given in the Check-List and supply any omissions or corrections that may be necessary, for the area with which he is familiar; in order that such material shall be available to the Committee in the future.

The more discussion and the more coöperation in this work the better.

WITMER STONE.]

Destruction of Sapsuckers.

TO THE EDITOR OF THE AUK:

Dear Sir: The Directors of the Massachusetts Audubon Society by letter, and Mr. C. J. Maynard in print,¹ have objected to the recommendation by the Biological Survey of the use of strychnine in destroying sapsuckers, because hummingbirds visit the drills to feed on the sap. I would much appreciate an allowance of space in 'The Auk' for a defense of our position.

In the first place Mr. Maynard apparently has formed his opinion from a perusal of Farmer's Bulletin 506 which contains only a brief abstract of the hundred page bulletin on 'Woodpeckers in relation to trees and wood products.' In that publication it is made clear that the greatest damage done by sapsuckers is not killing trees, but rendering defective the wood

¹ Records of Walks and Talks with Nature, VI. No. 10, Dec. 5, 1912, pp. 34-37

of valuable timber trees which they work upon year after year, but which are not seriously affected so far as health or external appearance are concerned. Mr. Maynard says: "Personally we have never seen any serious damage done to trees by sapsuckers in the eastern seaboard states from Maine to Florida." This comment means nothing; the writer has never seen hummers or other birds visit sapsucker pits, but he does not doubt the truth of observations on this point. In fact he is able to make out a much stronger case against himself than have the above mentioned persons.

Hummers probably make more of a practice of visiting sapsucker pits than any other birds, but several other species are known to do this occasionally. One species, the California Woodpecker (*Melanerpes formicivorus bairdi*) is recorded as so doing on the authority of Joseph Grinnell in Biological Survey Bulletin 39, p. 92. F. L. Grundtvig¹ states that in Wisconsin *Dryobates pubescens*, *Sitta carolinensis*, *Regulus calendula*, *Icterus galbula* and *Dendroica coronata* help themselves from sapsucker holes. N. B. Moore notes that on New Providence, Bahamas, *Cæreba bahamensis*, *Dendroica tigrina* and *D. coronata* sometimes feed at sapsucker punctures. As to the ruby-throated hummingbird Frank Bolles gives a very full account in 'From Blomidon to Smoky', pp. 131-175, and 260-273. He also mentions the downy woodpecker.

Dr. Ned Dearborn in experimenting upon sapsucker poisoning in the Angeles Forest, San Bernardino Mts., Calif., picked up 7 hummers (*Calypte anna* and *Selasphorus rufus*) and one warbler (*Vermivora rubricapilla gutturalis*) killed by strychnine in sapsucker pits in two days. It seems evident that hummers habitually visit sapsucker holes, while several other species of birds do so occasionally. The former incur much danger therefore from poisoning operations; the latter little.

Some other factors also must be considered: few people will take the trouble to poison sapsuckers; it will be done only locally, for the preservation of especially valuable ornamental or fruit-producing trees; that is, when the money or time loss is apt to be large and in such cases relief cannot be denied; poisoning in any one place need be continued for only a few days; as soon as the poisoned punctures dry danger to birds is past; the yellow-bellied sapsucker damages trees throughout the eastern United States, but except in the extreme northern part, *i. e.* in its breeding range — usually at a season when the birds known to visit its pits most frequently are absent from the country.

The problem of sapsuckers among woodpeckers is very similar to that of the few injurious members of the hawk and owl family. The whole race of raptorial birds has been popularly condemned chiefly on account of the depredations of a small proportion of the species. This question has been scientifically investigated by Dr. A. K. Fisher and his recommendations as to denial of protection to the Goshawk, Sharp-shinned and Cooper's Hawks and the Great Horned Owl have been embodied in the laws of many States.

¹ Trans. Wis. Acad. Sci., Arts and Letters X. July, 1894, pp. 113-114.

So it is with woodpeckers. The whole family has had a black name chiefly on account of the damage committed by the sapsuckers.

It has long been known that sapsuckers do some damage to trees but the subject was never properly investigated until the Biological Survey took up the work, the results of which appear in our Bulletin 39. As a consequence of this investigation it was apparent that the damage committed by these birds is very great. Manifestly it would be absurd to publish an account of such damage without making some recommendations for the relief of persons suffering loss. Even as it is, we are so far unable to recommend anything practicable to protect trees in forests, and it is here that the bulk of the damage is done, namely, the production of defects in wood which cause a lowering in the grade of lumber from the affected trees. The protective measures recommended by the Biological Survey are available for use only in orchards and ornamental plantings. This in itself tends to limit the danger to other species of birds.

The only known alternative to poisoning as an aggressive measure against sapsuckers is shooting, and of these two, we chose the lesser evil. If no recommendations as to methods of combating the birds were made, no doubt the majority of people would take the gun. We have advised against this method and in favor of poisoning because if attempts to shoot the birds were made, practically all other species of woodpeckers would suffer severely. It is well known that there is a great confusion in the popular mind regarding the identity of sapsuckers. The poisoning method itself selects the species responsible for the damage, and this is a thing which would never be done in shooting unless a competent ornithologist were hired to do the work. The Downy and Hairy Woodpeckers especially would be shot on sight. They are now very widely known as sapsuckers and they are very much more valuable birds than the hummingbirds and warblers that visit sapsucker holes. Moreover, they would be subject to shooting at any time while the other birds, with the exception of hummers, will suffer much less by reason of the use of strychnine, because their visits to sapsucker holes are only of occasional occurrence. We feel certain that we have made the recommendation involving least danger to beneficial species.

Some criticism has been elicited also by the unavoidable killing of certain birds in the campaigns against destructive rodents in the west, but we may be sure these complaints are made by people who have not suffered heavy losses from the depredations of prairie dogs, gophers, and ground squirrels. So also persons who have valuable trees ruined will not be greatly concerned if in destroying the sapsuckers they kill also a few hummingbirds. The latter in the words of Professor F. E. L. Beal,¹ really have "but little economic interest and that little is mostly in the wrong direction."

The study of the relations of woodpeckers to trees in connection with Professor Beal's study of their food habits, really for the first time made clear the economic status of these birds. The fixing of blame upon the true

¹ Farmers' Bull. 506. 1912, p. 17.

offenders, and freeing the others from the stigma of guilt is a benefit to the useful species. Moreover it advances the cause of bird protection as a whole. If the protection of birds is to rest upon an economic basis the truth must be learned and told or the whole movement receive a setback. If bird protection, on the other hand, is to be based upon æsthetic principles, the writer will agree and support the cause, if only the pleading be on that basis. But in the scientific study of economic values, utilitarianism must prevail, and the rule of the greatest good to the greatest number be uncompromisingly applied.

W. L. McATEE.

NOTES AND NEWS.

'THE AUK' is indebted to Mr. Louis Agassiz Fuertes for the admirable drawing of the Great Auk which with the present issue replaces the cover design that has done service for the past thirty years. While it may be true that our familiarity with living Great Auks has not increased in this period, it is equally true that in that time an artist has been developed, whose ability in depicting bird life, has enabled him to make what is unquestionably a far closer approximation to the actual appearance of this famous bird, than was possible for any of our bird-artists of a quarter of a century ago.

Mr. Fuertes has moreover had the benefit of suggestions from Mr. D. G. Elliot, Dr. Frederic A. Lucas, and Mr. Frank M. Chapman; while the rocky islet upon which his birds are shown, is based upon a photograph of Funk Island, where Dr. Lucas in 1887 procured a large collection of Great Auk bones.

In the first number of 'The Auk' January, 1884, Dr. Elliott Coues in commenting upon criticisms of the name of the journal, hoped that instead of becoming extinct like its namesake, 'The Auk' might long flourish, and that in it the bird might live again — or as he put it "*in pennis ALCA rediviva.*" In the 28 years of Dr. Allen's guidance this hope has been amply fulfilled, so far as the text is concerned; and we can now say the same thing of our cover, or following Dr. Coues — "*in pennis Fuertesi ALCA rediviva!*"

BRADFORD TORREY, a Member of the American Ornithologists' Union and widely known as a writer of outdoor sketches, died at Santa Barbara, Cal., October 7, 1912, after a short illness. He was born at Weymouth, Mass., October 9, 1843, a son of Samuel and Sophronia (Dyer) Torrey, and was educated in the public schools of his native town. After completing his school course at the age of eighteen, he worked for a short time in a shoe factory, taught school for a year or two, then, after occupying positions with two business houses in Boston, entered the office of the

Treasurer of the American Board of Commissioners for Foreign Missions in that city, where he remained about sixteen years. In 1886 he found more congenial occupation as one of the editors of the 'Youth's Companion,' but he resigned this position in 1901 to devote himself exclusively to his own literary work. After leaving Weymouth he lived successively in Boston, Melrose Highlands, and Wellesley Hills, Mass., but since the winter of 1907 he had been at Santa Barbara,— whether as a mere visitor or as a permanent resident his friends were unable to learn.

As a boy and young man Bradford Torrey, though a great reader (eschewing fiction, however), was fond of walking in the woods and fields, but it was not till some time after he had left the country to make his home in Boston that he became especially interested in birds or in any form of outdoor study. He has told the story of his introduction to ornithology in a sketch entitled 'Seraping Acquaintance' included in the first of his books. This was not his earliest literary venture, however. He had written a paper on the birds of Boston Common, which, at the instance of friends who had heard him read it, he had sent to the 'Atlantic Monthly,' which printed it in February, 1883. Encouraged by this success, which had been quite unlooked for by him, he embarked on what finally became his life work as a writer of discursive essays on birds, flowers, and the world out of doors. Many of his essays made their first appearance in the 'Atlantic.' Others were printed in the 'Boston Transcript,' the 'Youth's Companion,' the 'Christian Endeavor World,' and elsewhere. His first book, 'Birds in the Bush,' was published in Boston in 1885. It was followed by 'A Rambler's Lease' (1889), 'The Foot-Path Way' (1892), 'A Florida Sketch-Book' (1894), 'Spring Notes from Tennessee' (1896), 'A World of Green Hills' (North Carolina and Virginia) (1898), 'Everyday Birds' (juvenile) (1901), 'Footing it in Franconia' (1901), 'The Clerk of the Woods' (1903), 'Nature's Invitation' (New Hampshire, Florida, Texas, and Arizona) (1904), and 'Friends on the Shelf' (literary criticism) (1906). Mr. Torrey also edited Thoreau's Journal in fourteen volumes (1906 and 1907). Shortly before his death he had sent his publishers copy for a book to be called 'Field-Days in California,' which is announced for publication in the early spring of 1913.

For many years Mr. Torrey spent a part of the spring, summer, or autumn at Franconia in the White Mountains region of New Hampshire, and many of his most delightful essays are records of his observations and reflections there, but he also visited other parts of New England (just over the line in the Province of Quebec too), and about 1894 he began going South for the late winter and early spring. He thus visited Florida, Tennessee, North Carolina, Virginia, Texas, Arizona, and finally California.

At the first meeting of the American Ornithologists' Union, in 1883, Mr. Torrey was made an Associate Member, and he was elected a Member in 1901, when that class was instituted. He was a Resident Member of the Nuttall Ornithological Club from 1884 to 1886. He published a paper on

'The Booming of the Bittern' in 'The Auk' for January, 1889, and an even dozen of General Notes at intervals from 1886 to 1905. He also contributed two articles to 'Bird-Lore' and during the years 1907-10 he printed twelve notes in the 'Condor.'

It was through his literary writings, however, that Mr. Torrey rendered his best service. He combined to a very unusual extent the scientific with the æsthetic habit of mind. He was always accurate and careful in his observations and statements, and he had a happy way of turning even his scientific doubts and disappointments to good account in a literary way, as when his long search for Ravens in North Carolina ended with the bagging of a 'brace of interrogation points.' His combination of enthusiasm with a humorous detachment was also one of his greatest charms as a writer, and one which made it possible for readers without any particular knowledge of or interest in birds to enjoy his writing almost as much as the confirmed bird-lover. Besides this he had a gentle and cheerful philosophy that led him to interest himself in his fellow men, whom he considered, after all, quoting Scripture as he was fond of doing, to be 'of more value than many sparrows.' The birds, as well as the trees and wild flowers which also occupied much of his attention, he regarded as a part of outdoor nature, and his essays are pictures of the landscape — of New Hampshire, Cape Cod, Florida, Arizona — no less than accounts of the birds he found there. His style is conversational, chatty we may call it, but exact and carefully considered, and he spared no pains in the preparation and revision of his copy for publication.

Mr. Torrey was a lover of music and for years a regular attendant at the Symphony concerts in Boston. His own instrument was the piano, upon which he was fond of improvising. In his social relations he was too modest and retiring to form a wide acquaintance, but he was much loved by the small circle of his more intimate friends, who found him always sincere and loyal and of an even, cheery temper, while no one could talk with him without being impressed by the fineness and rare purity of his character.

F. H. A.

WE have just been advised of the death on January 8, 1898, of Valdemar Knudsen who was elected a Correspondent of the American Ornithologists' Union in 1888 when he was actively engaged in studying the birds of the Hawaiian Islands, making his home on Kauai. He at that time sent numerous collections to the U. S. National Museum which were described in papers by Dr. Leonhard Stejneger, who named *Puffinus knudseni* and *Himantopus knudseni* in honor of the collector. Mr. Knudsen was born in Norway Sept. 5, 1822.

MR. WILFRED H. OSGOOD of the Field Museum of Natural History returned in October from a nine months' trip in South America, having crossed the Andes of northern Peru and descended the Amazon River to its mouth. He was accompanied by Mr. Malcolm P. Anderson who has remained for

further work in eastern Peru and northern Brazil. At date of last shipment their collections of birds and mammals numbered over 2000 specimens including a very large number of species, since they were successful in obtaining a representation of three very distinct faunas, the arid west coast of Peru, the high Andean region, and the upper Amazon valley. On December 14, Mr. Robert H. Becker sailed from New York to join Mr. Anderson for continuation of the work during the coming year.

FOUR new 'habitat' groups of birds have been completed recently at the Field Museum of Natural History, respectively showing the Northern Loon, the Great Blue Heron, the Whooping and Sandhill Cranes, and the Golden Eagle, besides a few species of smaller size. They have been installed in a handsome quadripartite case of the style previously used for such exhibits and show considerable advance in technique, especially in the perfection obtained in the reproduction of various types of vegetation. All have large backgrounds by Mr. C. A. Corwin. The loon group shows two adult birds, nest and eggs, and scene in northern Michigan. The heron group includes several great blues and a 'rookery' of large nests in trees is represented on the painted background. The crane group contains three large 'Whoopers,' one of them in the beautiful tan-spotted immature plumage. A single adult Sandhill Crane is shown also and all four are placed in a beautiful setting in the brilliant fall colors of the vegetation along a small stream in northern Illinois. The Eagle group contains a pair of adult birds and their young in a nest on the side of a particolored cliff in the badlands of North Dakota. The background shows a picturesque bend of the Little Missouri River with soft-colored terraced buttes in the distance. The modeling and taxidermy of the four groups are by Messrs. Julius Friesser and Leon L. Pray.

MR. LEO E. MILLER, who met with so much success in Colombia collecting for the American Museum, together with Mr. Francis X. Iglseder, as his assistant, sailed from New York City on November 26, for South America, for the purpose of continuing the investigation of the birds and mammals in the interests of the American Museum.

ON December 10 Dr. John C. Phillips and Dr. Glover M. Allen arrived in Port Said, Egypt, after a voyage which their cabled messages describe as wholly pleasant. With few delays they will proceed to Khartoum and then meet a camel caravan which is ready and waiting their arrival. The plan is to spend several months collecting for the Museum of Comparative Zoölogy in the Atbara River region near the borders of the Sudan and Western Abyssinia. Especial attention will be paid to preserving birds and mammals but efforts will also be made to secure representative series of other groups, such as reptiles, amphibians, fishes and insects. Dr. Phillips hoped to be able to secure, in Khartoum, natives who had been employed on previous expeditions and thus secure skilled assistance in collecting.—T. B.

MR. W. E. CLYDE TODD with two companions made a trip to James Bay during the summer under the auspices of the Carnegie Museum and the National Geographic Society. They left Pittsburgh, May 15 last, and travelled by canoe from the terminus of the Temiskaming and Northern Ontario Railway to Moose Factory. Here a small sailing vessel was secured and the southern and eastern shores of James Bay were explored. The unusual weather conditions and failure to secure suitable guides prevented them from going farther north as they had expected. Good collections of birds and mammals were secured, however, and much data on distribution and migration. The expedition returned November 16.

WE learn from Mr. Robert Ridgway that Volume VI of the Birds of North and Middle America is being pushed rapidly to completion. It will comprise the Picidæ, Capitonidæ, Ramphastidæ, Galbulidæ, Bucconidæ, Alcedinidæ, Todidæ, Momotidæ, Caprimulgidæ, Nyctibiidæ, Strigidæ, Aluconidæ, Psittacidæ and Cuculidæ. The manuscript covering the first ten families is finished, except for the genus *Chordeiles*, while that of the remaining four is partly completed. The portion relating to the Woodpeckers is already in type.

Our readers will also be glad to know that the publishers of Mr. Ridgway's long expected new 'Nomenclature of Colors' have promised some copies by the first of January, 1913.

THE project of establishing wild-fowl refuges in the marsh lands of Louisiana and Texas originated by Mr. E. A. McIlhenny and Charles W. Ward received a great impetus from the purchase of Marsh Island Louisiana, by Mrs. Russell Sage, announced early in October, 1912. This tract comprises 75,000 acres and adjoins the Ward-McIlhenny Wild Fowl Refuge, and the Louisiana State Wild Fowl Refuge, which together cover 60,000 to 70,000 additional acres.

Gunning on the Marsh Island tract will be absolutely prohibited and it will form a permanent refuge for all kinds of wild bird life.

'Forest and Stream' for October 12, 1912, gives a detailed account of this region based upon investigations by Mr. George Bird Grinnell who visited Marsh Island at the instance of Mrs. Sage prior to the purchase.

AT the last meeting of the American Ornithologists' Union, Mr. A. C. Bent, who is engaged on the continuation of Major Bendire's work on the 'Life Histories of North American Birds' presented a 'report of progress' designed to show what he had actually accomplished and also to arouse more interest among the members of the Union in an undertaking which can never be completed by the unaided efforts of any one man.

For over twenty years Mr. Bent has devoted his spare time to visiting various points of ornithological interest in North America for the purpose of collecting the information, photographs and specimens necessary for an extensive work on the breeding habits of North American birds.

During this time he has visited both northern and southern Labrador, Newfoundland, all of the southern provinces of Canada from Nova Scotia to British Columbia, all the Atlantic and Gulf states from Maine to Louisiana, many of the inland states and the Pacific coast from Puget Sound to northern Alaska, including the Aleutian Islands. He has made a more or less extensive field acquaintance with over 500 different birds and has accumulated a large amount of notes, photographs and other material, which form the basis of his personal contribution to the work.

Since he undertook to continue Major Bendire's work on the Life Histories of North American Birds he has, with some clerical assistance, looked through nearly all of the more important ornithological publications which he could conveniently reach, and made a bibliographical index to such published notes on life histories as he might care to use, covering all the species which are to be included in the next volume to be published. Much further work in this direction still remains to be done, for which he is open to receive offers of assistance from competent ornithologists who are willing to undertake this work and for which he is willing to pay a reasonable price for the time and labor involved; this work should be done by someone who has access to one or more large libraries.

Major Bendire's first volume began with the Gallinæ, A. O. U. number 289, and his second volume ended with the Icteridæ, A. O. U. number 513, including 223 species in the two volumes. Considering the fact that comparatively little is known about many of the water birds and that many of the ocean wanderers and stragglers need little more than passing mention, as American birds, it seems safe to plan on covering all of the first part of the A. O. U. Check-List, up to where he began, in two volumes. The present plan, which is subject to revision, is to have the first volume cover the Colymbidæ to the Anatidæ, at least as far as the Geese; as the life histories of many of the Tubinares will be decidedly brief, it may be possible to include all of the Anatidæ in this volume.

The work of gathering information, material and contributions for the Life Histories has been partially organized on a very satisfactory basis. As it is impracticable, if not impossible, for any one man to know and keep in touch with all of the reliable observers and contributors in North America, it has seemed best to place this work in the hands of competent leaders in various parts of the country, who are fitted and willing to take charge of the work in their particular sections, to arouse interest among their acquaintances in collecting information and material, to secure contributions from competent and reliable observers and to pass judgment on the accuracy and reliability of whatever they send in for publication. The following well known ornithologists have already generously volunteered to serve in this capacity:—

Rev. W. W. Perrett for northern Labrador.

Dr. Chas. W. Townsend for southern Labrador.

Mr. W. E. Saunders for Ontario and Quebec.

Mr. Arthur H. Norton for Maine.

Mr. Witmer Stone for Eastern Pennsylvania and Southern New Jersey.

Mr. H. H. Bailey for Virginia.

Mr. T. Gilbert Pearson for North Carolina.

Mr. Arthur T. Wayne for South Carolina.

Prof. Lynds Jones for Ohio.

Mr. Benj. T. Gault for Illinois.

Prof. Walter B. Barrows for Michigan.

Dr. Thos. S. Roberts for Minnesota.

Mr. Chas. R. Keyes for Iowa.

Rev. P. B. Peabody for Kansas.

Mr. Edw. R. Warren for Colorado.

Mr. Aretas A. Saunders for Montana.

Mr. Allan Brooks for British Columbia.

Mr. S. F. Rathbun for Washington.

Mr. Wm. L. Finley for Oregon.

Mr. A. B. Howell for California.

Nearly all of these collaborators have reported more or less progress in arousing interest in the work among their correspondents and considerable material has been sent in and filed away for future use, but in far too many cases the results of their labors have been disappointingly small. This is due to the following causes:—

(1) The water birds have always been the most neglected class of American birds, because to many ornithologists they are the most inaccessible and the least interesting. Consequently there is little information about them available. Unfortunately the information about the water birds is wanted first.

(2) Throughout the settled portions of North America there are comparatively few water birds still breeding and they are becoming scarce in many sections even as migrants. In regions where water birds are still abundant there are very few competent observers who have time to devote to bird study.

(3) The third cause, the only one of the three that can be removed, is the apathy and indifference of the men who could give the information wanted if they could only be induced to do so. Many good observers have promised to contribute but through procrastination or for lack of time have failed to do so as yet. Many men seem to prefer to publish their notes in the current periodicals, where they appear promptly. But there are a host of others whose interest has yet to be aroused to the necessity of cooperation, if this work is ever to be brought to a successful conclusion. It is to be hoped that collaborators will succeed in arousing more enthusiasm in this work so that the publication of the next volume may not be too long delayed.

Eighteen life histories have already been written, but as they contain mainly the results of Mr. Bent's personal observations, together with such quotations from published material as seemed desirable to make them more

nearly complete, they are open to additional contributions from others, as well as final revision. Preference will always be given to original contributions, quotations from published literature will be reduced to a minimum and contributors will be given full credit for whatever material they furnish.

Mr. Bent already has in his own field notes nearly enough material to write the life histories of over half of the species to be included in the next volume, but, even after exhausting all the material contained in the published literature on the subject, there are surprisingly few species on which we have sufficient material to write even fairly complete life histories. A large number of printed lists of the information wanted have been distributed and they will be freely furnished to all who care to contribute. An extensive study of the published material brings to light some interesting facts; a vast amount of data has been published on migration and distribution, nesting habits have been written up more fully than any other phase of the subject and considerable has been written about the food of birds, particularly from an economic standpoint; but the exact period of incubation and the development of the young has been carefully worked out for very few species, the sequence of plumages in the water birds has been sadly neglected and comparatively little has been published on winter habits.

For many of the water birds only the most meagre life histories could be culled from the published literature on the subject. To collate and compile in an extensive work on this subject all that has been published relating to the life histories of North American birds, is an undertaking well worth while, but the value of any work of this kind is greatly enhanced by a liberal addition of original material, which was a marked feature of Maj. Bendire's work.

Mr. Bent has several years' work planned out in northern exploration for the study of the breeding habits of the more inaccessible species, but, in order to do this field work, he must rely largely on others for the information wanted about other more accessible species. There are few ornithologists who cannot find the time to study effectively some phases of the life history of one or more species, which are readily accessible.

There is much information which is badly needed and which could easily be obtained; much information of value lies buried in the field notes of nearly every observer; even fragmentary notes are often valuable as contributions to life histories; and it is only by collecting as much of this material as possible that we can hope to get anything even approaching completeness.

Finally, Mr. Bent thanked all those who have helped in the work, so far, and assured them that they will receive full credit for what they have done. He desires more collaborators to take the leadership in sections not covered in the foregoing list and should be glad to receive offers or suggestions. This much needed work on the Life Histories of North American Birds is now a living issue and it is being pushed vigorously, and we hope that this plea for help will not prove useless and that American ornithologists will show their interest in the work by cooperating to make it successful.

MR. WILLIAM LEON DAWSON, well known as the author of 'The Birds of Ohio' and 'The Birds of Washington,' announces the early publication of 'The Birds of California,' a work of over 1500 pages, with 750 half-tone cuts and 24 full-page color plates from original paintings, by Mr. Allan Brooks. The work is by Mr. Dawson with the cooperation of the Cooper Ornithological Club, and is announced to comprise a complete scientific, and popular account of the more than 500 species of birds found in the State of California, with analytical keys and other helps to ready identification, representative local lists and other appropriate critical matter.

Like 'The Birds of Washington' there will be several editions differing in illustrations, quality of paper, etc. The entire issue is limited to advance subscriptions. The Students Edition will sell for \$15 to \$30 according to the style of binding, and Booklovers' Edition limited to 500 copies, at \$45; Large paper Edition de Luxe, limited to 250 copies, at \$67.50; Sunset Edition de Luxe, limited to 250 copies, at \$110; Stockholders' Edition de Luxe, limited to 250 copies, at \$150; and the Extra Illustrated Patrons' Edition De Grand Luxe, limited to 100 copies at \$1000. The last is in four volumes, the other editions in three.

THE first Annual Dinner of the Linnæan Society of New York was held at the Hotel Endicott in that city on the evening of December 17, 1912, and was attended by over sixty members and invited guests.

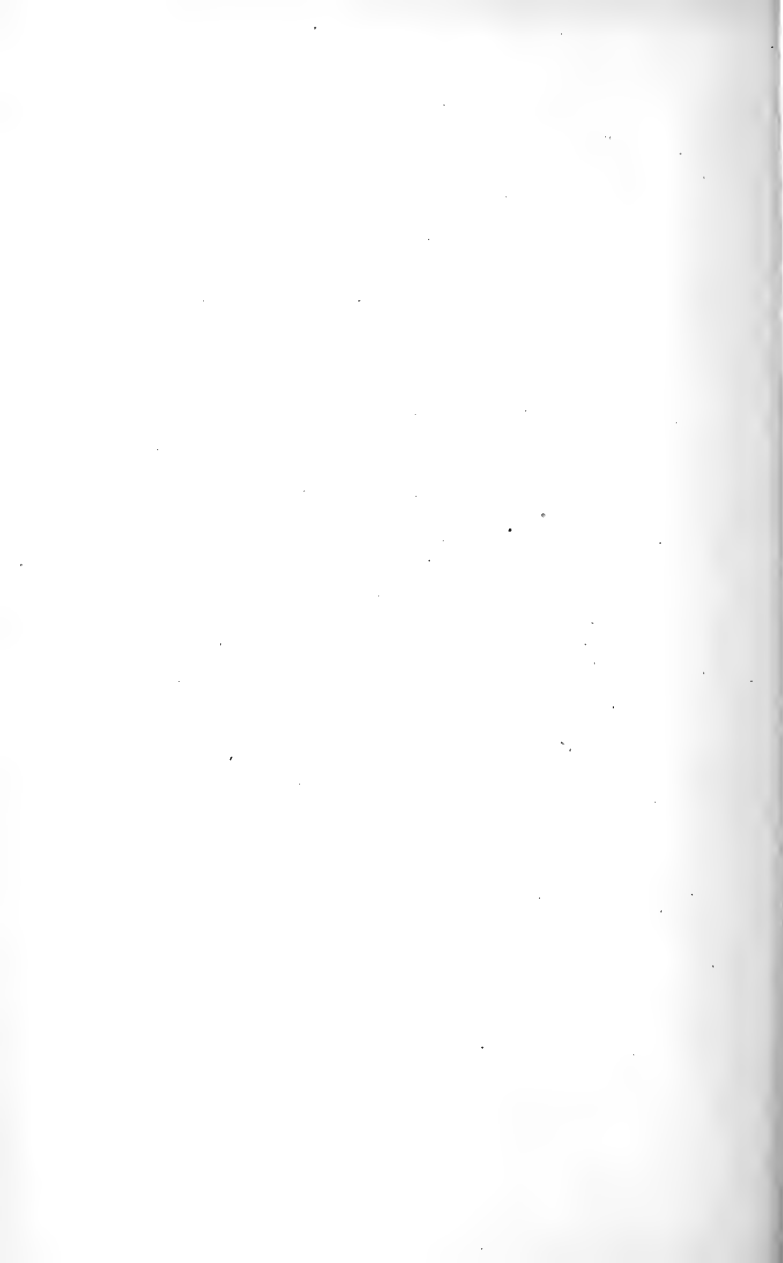
The object of the dinner was two-fold: to bring the members together in an informal, social way, and to express to Mr. Frank M. Chapman, the guest of honor, the Society's appreciation of his invaluable services to ornithological science through his well-known work in popularizing the study of birds.

President Jonathan Dwight, Jr., acted as toastmaster, and among those at the speakers' table were, besides Mr. Chapman, Henry Fairfield Osborn, Frederic A. Lucas, John Burroughs, Ernest T. Seton, A. K. Fisher, John H. Sage, T. Gilbert Pearson, George Bird Grinnell, and Spencer Trotter.

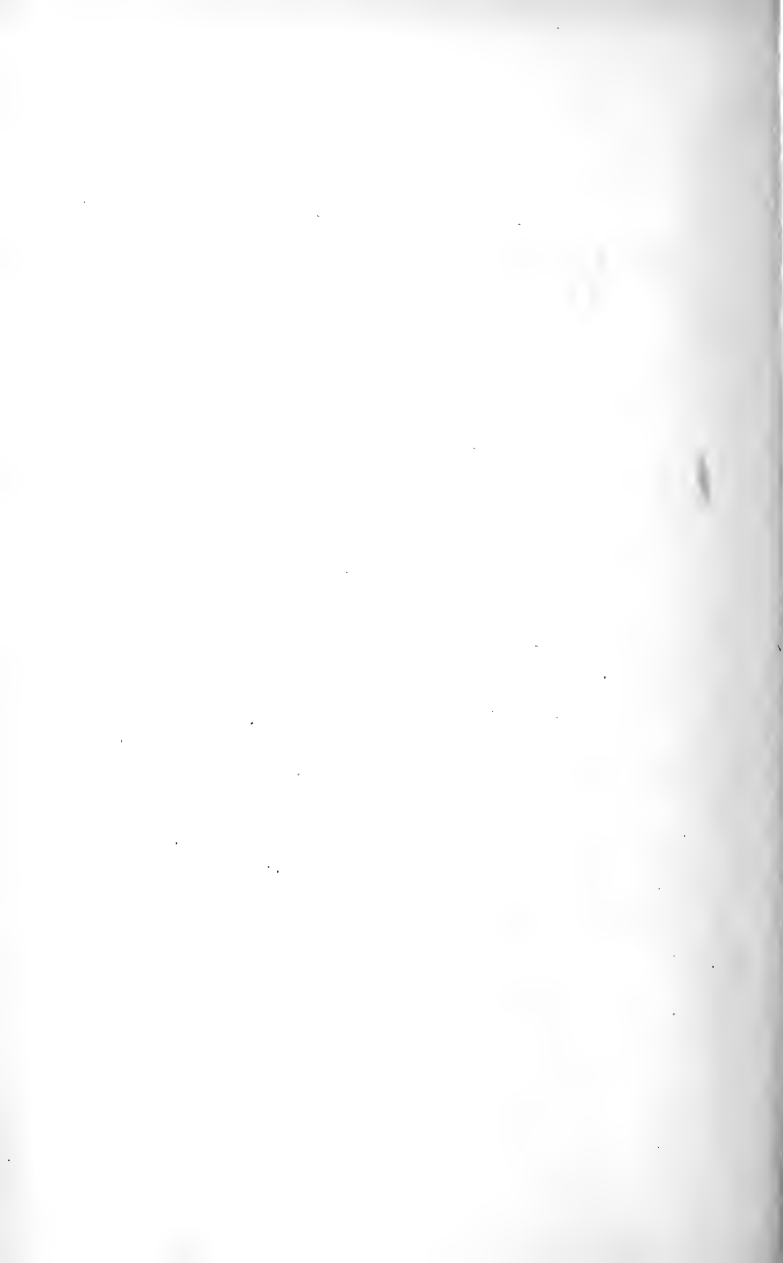
The Linnæan Society was founded in March, 1878, with but ten members, including such men as H. B. Bailey, Ernest Ingersol, Dr. C. Hart Merriam, John Burroughs and Dr. A. K. Fisher. Its object has always been to promote the study of natural history, and its growth and increasing influence since those early days have been most gratifying.

Mr. Chapman became a member of the Linnæan early in his career and has remained closely identified with its activities. His unremitting efforts in stimulating interest in bird study are too well-known to need detailed mention here, and as tribute to them Dr. Dwight, on behalf of the Society, presented him during the dinner with the Linnæan Medal.

The unqualified success of this first annual dinner of the Linnæan leads to the hope that it will become a permanent feature of the Society's active season.







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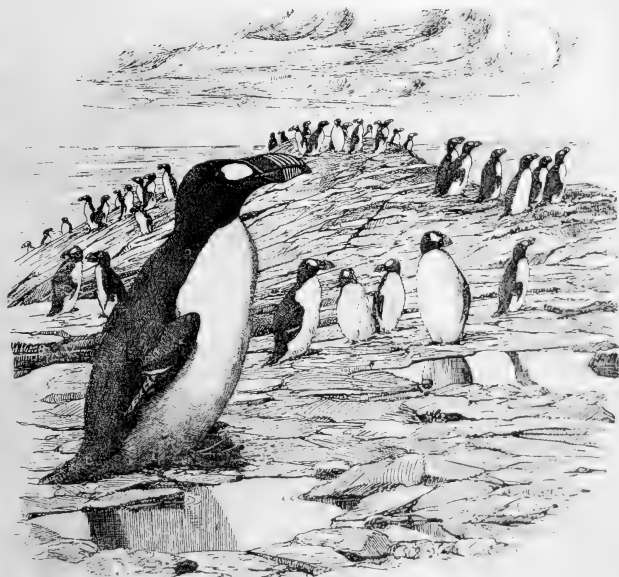
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NEST OF SWAINSON'S HAWK (*Buteo swainsoni*).

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No. 2

NOTES ON SWAINSON'S HAWK (*BUTEO SWAINSONI*) IN MONTANA.

BY E. S. CAMERON.

I. NESTING.

SOME twelve years ago Swainson's Hawk, or the Common American Buzzard, was one of the commonest birds breeding in eastern Montana, but has, since then, been greatly reduced in numbers. At the period mentioned, despite incessant persecution, half a dozen inhabited nests might easily be found during any year in my own neighborhood alone; but at the present time the numerous unoccupied nests in the white ash and cottonwood trees, to which their dead or disheartened owners have never returned, bear pathetic testimony to the gradual disappearance of this hawk as a nesting species. Swainson's Buzzard is locally called 'Hen Hawk,' yet the term is a complete misnomer, for in my twenty-three years' experience with the bird I have never observed it to take poultry of any kind, nor have I obtained the slightest evidence that it ever does so. However, if you give a dog a bad name you may hang him, and the unfortunate buzzard, being credited with the misdeeds of the Prairie Falcon, Goshawk, or Harrier, is in a like case. Here, at all events, the parent birds are shot and the young ruthlessly stoned on sight. As I have already stated in 'The Auk' (Vol. XXV, p. 468) Swainson's Hawk is often most indiscreet in its choice of a building site, selecting a low tree by the roadside,

or within a fenced pasture, for its nest, which thus becomes forthwith the cynosure of hostile eyes. My own study of buzzards in their haunts has from this cause been considerably hindered — sometimes abruptly terminated for the time being — by the destruction of the eggs or young of the very birds I wished to keep under observation.

Swainson's Hawk, when seen flying in the distance, resembles a small Golden Eagle, and there are not a few attributes which are common to both species. Among the latter may be mentioned the facts that both pair for life, both shade their young from the hot sun, and both possess a sense of ornamentation which leads them to decorate their nests. The above characteristics are quite probably shared by all members of the sub-genus *Buteo*, but the further fact remains that neither the Golden Eagle nor Swainson's Hawk ever seems to drink water — at least in captivity —, and this exceptional peculiarity suggests a close affinity between them. Like all buzzards, Swainson's Hawk has a lazy, apathetic temperament, usually preying upon the humblest quarry, and permitting unprovoked attacks upon itself by small and weak tormentors. On occasions, however, when hunger presses, or its eyrie is menaced, the bird can display unexpected dash and ferocity. In May, 1905, a Swainson's Hawk that nested by the Yellowstone near the Terry ferryboat crossing, became so bold as to swoop at the passers-by. A prominent flockmaster, owner of the land, was much annoyed by the bird's threatened assaults, and instructed the ferryman to shoot the assailant. Hearing of this, I interceded successfully with the latter, and secured his co-operation to protect the hawks: but we were unable to save their three eggs from a meddling shepherd, who removed and ate them. In the Lake District of Cumberland, England, during the summer of 1910, a Common Buzzard (*Buteo buteo*) which differs but little from *B. swainsoni*, also made frequent attacks upon visitors to its haunt. A correspondent of 'Country Life' for June 25, 1910, contributed an account of his experience, describing how he had to take refuge successively under a tree and behind a wall to avoid the "tremendous swoops" of the bird.

As the present article is very long, I forbear to give a detailed description of the remarkable buzzard flocks which occur at the

migration periods. Those interested can find a full account in 'The Auk' (Vol. XXIV, p. 262) of a buzzard invasion which I witnessed on the Powder River, numbering nearly 2000 birds, probably the largest aggregation of these hawks ever recorded. Since the above event, which happened in April 1890, other observers, as well as myself, have seen many smaller flocks of varying numbers, while a small party of only seven birds was observed by me on Sept. 27, 1911; but it may be hoped that the decrease in size of the Montana migration does not afford a true indication of the rate at which this species is diminishing. The earliest date at which I have noted the spring arrival of a Swainson's Hawk was March 14, 1911, and the latest fall lingerer was observed on November 25, 1910.

The nests of *B. swainsoni* are made entirely of sticks, or of sticks combined with other materials, such as sage-brush, wild-rose brambles, and cottonwood or cedar twigs. There may be an elaborate lining of green weeds, or quantities of wool — perhaps only a scanty layer of grass. Some birds line their nests with fresh leaves, which are renewed at intervals, but, in my experience, this does not occur until after the full clutch of eggs has been laid. The parent birds roll back the eggs and replace them on the leaves, which is not a difficult feat, as many nests are almost flat. As the hawk apparently mates for life, the nest, which is very strongly put together, increases in size with the yearly repairs. In my own experience I have known disused nests to be practically intact after a period of seven or eight years. Since 1889, I have seen a great many occupied nests, but only kept notes of fourteen. Of these six were in ash trees, six in cottonwoods, one in a low cedar, and one in a wind-swept pine-top. This last, on a dominant scarp of the pine hills, was the most picturesque of all, but could not, of course, endure long without renewal, and is the only nest I have seen thus exposed.¹ The number of eggs in seven nests was three, in a couple of others two only: one nest was deserted after a single white egg had been laid, and of four the contents were not examined as I did not climb to them. Two fledglings seen in the tree do not necessarily indicate two eggs, as in about half the clutches of three

¹ A photograph of this country was reproduced in 'The Auk,' Vol. XXV, 1908, p. 251.

eggs one is infertile, and may be found in a perfectly intact state after the young are flown. The color of the eggs is variable, but in all sets of three that I have seen, one egg has been entirely white. In a single instance, two of the three eggs were unmarked, greenish white. Some of the other eggs in the eight nests were blotched with chestnut or umber brown, the remainder being merely flecked with scattered dots of these colors. I never found but one heavily marked egg, and that had the whole ground of its upper half almost completely obscured by umber brown. The first part of June is the usual time to find Swainson's Hawk sitting on eggs, but that depends largely on the weather. I have seen an early incubating bird on May 7, and a late one on June 27. The time of incubation is about twenty-five days, but as with the Marsh Hawk, Hoot Owl, etc., the young are often hatched at intervals, so that the eldest may be full-fledged while the youngest is in the fluffy stage. The cock bird will occasionally sit upon the eggs, and I have twice flushed him from them; but, in my experience, such action is unusual, as the male is generally absent foraging for the female. There are recorded instances of Swainson's Hawk occupying the deserted nests of other birds, but all the pairs which I observed built their own nests, and declined to appropriate old nests of their own species. In one case, where a pair were shot at the nest, a second pair built another nest exactly above the first in a succeeding year. This appeared to me to be a curious coincidence, and it was a no less curious sight to see the two great nests, one above the other, in a small ash tree. If bereft of all their eggs, or nestlings, the discouraged hawks desert that nest forever; but, when deprived of the eggs only, they construct a new abode in which the female lays again. Early in May, 1906, a shepherd robbed a Buzzard's nest in a cottonwood of the three eggs, and the Hawks built a new one in a similar nearby tree. On June 1 the pertinacious hen-bird again sat upon three eggs, which were subsequently unmolested. In this respect these hawks differ from a pair of Golden Eagles, which will never forsake an established eyrie save upon the death of one of them.

Of the fourteen nests which I have kept under observation at different times, not one received such close attention as a nest built early in June, 1908, in a distant ranch pasture. This was not

due to my occasional visits, but to the fact that during the whole summer a boy herded a large bunch of horses outside the fence — a part of which had been taken down to enable the animals to come to water. In a cottonwood tree, directly above the water, the buzzards had placed their nest, and in ordinary circumstances would have enjoyed a welcome shade. As it happened, however, this particular tree had been blighted by the unprecedented blizzard of May 20, and remained almost leafless till August, when to my great surprise it was again covered with foliage. Until this happened the buzzard family suffered terribly from the sun's rays, and convincing testimony was afforded of the parents' devotion in shading their offspring. The nest was made entirely of cottonwood sticks, lined with grass roots. With characteristic indiscretion the birds had chosen a decidedly perilous situation, as the herd-boy above mentioned passed directly by the nesting tree, often with a companion, four times a day, besides spending nearly all his time in its immediate vicinity. He naïvely informed me that, before I discovered the nest, he had frequently stoned the incubating Hawk, but without causing her to forsake her eggs. She began to lay about June 14, sat on three typical eggs — two of them brown marked, one pure white but infertile — and on July 9, two nestlings were hatched. A fortnight later, black feathers appeared amidst their white down, and by the end of July they were full feathered except for their downy heads. The young birds as soon as they were able, sat about in the branches, but returned to the nest at night, and also on hot days, during which the parents shaded them. The presence of my wife and self beneath the low tree, or our loud talking, made no difference to the mother's solicitude for their comfort. In my experience the female Swainson's Hawk is one of the boldest and tamest birds at the nest, in marked contradistinction to her timid partner, which can seldom be observed at close range in the breeding season. The nestlings have enormous appetites, and consume more in proportion to their size than any other raptorial bird which I have studied or kept in confinement. When hungry they set up a piercing kitten-like cry until they are supplied with food.

In 1909, the same boy herded the horses, and exactly the same conditions prevailed for the hawks, which commenced nesting

operation earlier than in 1908. On May 15, I watched the cock bird trampling down material in the nest, and soon his mate came to his assistance. After a time, disturbed by my presence, the pair took wing to an almost invisible height, crossing and re-crossing each other in circles. The female began to lay on May 24, and I observed her deposit her third and last egg on May 26. After sitting hard for about twenty minutes, she stood on the nest edge, spread her wings, and gently glided off. Aided by the high wind, she soared in ascending gyrations until lost to view. I now had a good opportunity to examine the nest, which was much enlarged by the addition of cottonwood and choke-cherry sticks. It was thickly lined inside with cottonwood bark, which falls off in great layers from dead trees. The hawks could easily obtain the soft, fibrous, interior strips, and it was this substance that I had seen both birds arranging in the nest. The latter was also adorned at one end with a bunch of green weeds after the fashion of the Golden Eagle. In color two eggs were unmarked greenish white, but the third egg had a large yellowish brown blotch. The immense nest was out of all proportion to the eggs which were placed in one corner. On June 3, the eggs reposed in exactly the same position upon a thick layer of green cottonwood leaves. I cannot leave this part of the subject without referring to the persecution of this hawk by Kingbirds (*Tyrannus tyrannus*) which frequently nest in close proximity to the site chosen by it. In one instance during 1899, a pair of Kingbirds had built their nest in some choke cherries immediately below that of the hawk, which was in an ash tree growing amidst them. Yet another Swainson's hawk, nesting close by, was so unfortunate as to have a pair of Sparrow Hawks (*Falco sparverius phalena*) domiciled alongside. Neither of the Swainson Hawks could flap out of the nesting tree without being immediately attacked by one or other of these aggressive birds — sometimes by all of them together. In this connection it is interesting to read the following, as quoted from Capt. Charles E. Bendire by Dr. A. K. Fisher,¹ "Lieut. Benson writes me that, after the Arkansas Kingbirds (*Tyrannus verticalis*) began to build, he invariably found one of their nests in any tree that

¹ Hawks and Owls of the United States, p. 73.

contained a Swainson's Hawk's nest. In one case a pair of these birds had placed their nest directly under and but eight or nine inches from that of the hawk." Judging from my own observation, whenever these unlucky hawks left their nests they would be remorselessly harried by the intrepid Arkansas Kingbirds. I have seen one of the latter strike down a young Sparrow Hawk on the wing, which I took home and kept until it had recovered. The buzzard's peculiar flight upon catching the wind gives these small tormentors their opportunity, as she mounts in slow graceful spirals until a mere speck in the blue. When his mate was sitting, I have seen a male Kingbird (*Tyrannus tyrannus*) alight on the hawk's back and be carried round for several seconds, while he vented his rage by pecking at her. No matter how high the hawk might soar, the small aggressor would keep above her, renewing his attacks at intervals until both were lost to view. The hawk responded to each assault by merely giving four sluggish, downward flaps after which she would sail on motionless wings as before. These measured, floating gyrations, with wide expanded wings and tail, induced Forster to call the Common Buzzard of Europe *spiralis*, as pointed out by Seebohm.¹ My brother-in-law once informed me that he had seen a Swainson's Hawk strike in midair an aggressive Kingbird which had thereupon fallen dead to the ground. At the time this seemed to me an incredible assertion, and I supposed he had mistaken the species of hawk; but since witnessing the bunting flight, described later, I am inclined to believe it.

It was my desire to keep these young buzzards of 1909, in confinement and make observations upon them, more especially as regards the spring moult. Accordingly on August 6, I rode to the tree for the purpose of capturing them, but when I was ascending it, they both took wing. The female fledgling flew some distance down the creek, but fortunately the day was too calm for her to rise again from the long grass, and the less active male fluttered into a deep water hole. While I was engaged in capturing and securing the two fledglings in a sack, their distressed mother appeared on the scene, swooped towards me, or hovered above,

¹ British Birds, Vol. 1, p. 121.

uttering long-drawn tremulous mews. When I rode away, bearing her offspring, she followed at a great height. On the morrow we coaxed the young buzzards to sit on the branch of a tree for photographic purposes. An example was then afforded, if it were needed, of the difference made by wind to a bird's flying powers. The strong wind which arose enabled the female to fly clear away, nor could she be recaptured, even on horseback, as she rose easily from the level. I regretted having disregarded my wife's advice to anchor the Hawk by a pair of jesses; which, although rendering her portrait less effective, would have at least prevented her escape. She was presumably rejoined by her mother, who had been seen floating above the ranch. The male made no attempt to emulate his sister, for although hatched at the same time, she surpassed him in development by a week — a parallel case to that of young Golden Eagles. As observed in this instance, the female buzzard acquired the power of flight in twenty-eight days, and the male only after thirty-five days.

The remaining young buzzard was kept in the barn and soon became exceedingly tame. His varied bill of fare consisted of grasshoppers, beef, mice, small birds which the cat happened to catch and frogs. The last he greatly preferred to any other food, and, upon my entering the barn with a frog, flew eagerly to snatch it from my hand without giving me time to shut the door. So voracious was the bird's appetite that he would account for six large frogs at a meal, and was often compelled to disgorge those which he had swallowed whole to avoid being choked. I have known him to devour an entire rattlesnake at one time. The buzzard's manner of feeding is to fly into a corner with his prey, which he conceals from outside curiosity by presenting his back and spreading his wings and tail over it. At the same time he so completely ruffles his feathers that their white bases on the head and neck cause the parts to appear mostly white, and he screams defiantly if approached. In spite of all this precaution, however, as soon as he had finished his meal he would fly to me for a further supply, when he would repeat his antics as before. The above appears to be a characteristic habit of all eagles and buzzards which become tame in captivity, although I have never observed it in wild, nor in freshly caught birds. The buzzard ejects castings

from the mice, birds, and frogs in twenty-four hours after consuming them, but never drinks water — a peculiarity which he shares with captive Golden Eagles as above mentioned.

The young buzzard's cry differed according to his age. When he was quite young it resembled a kitten as stated, but by the end of August, when he was seven weeks old, it became loud and shrill like the scream of a sea-gull, though more piercing. At two months old he developed a musical cry, the appealing tone of which never failed to create a deep impression upon all who heard it. It consisted of four notes insistently repeated like $\bar{E} \check{U}$, $\bar{E} \check{U}$, the second \bar{E} being a half tone lower than the first, and may be described as long sustained wails followed by short staccato notes. While these four notes are difficult to express in words they could be easily reproduced upon the violin, and are not unlike the plaintive but shriller tones of the British Lapwing (*Vanellus vanellus*) when hovering over its breeding grounds. The buzzard commenced this lament whenever my wife or I were present, and continued it as long as either remained with him. The ornithologist Coues did not fail to notice it, and writing of two captive birds remarks: "Both this and the younger one before him had a peculiarly plaintive whistle to signify hunger or a sense of loneliness, a note that was almost musical in intonation."¹

As all the Hawk's wants were supplied, we considered that this must be a baby cry to express recognition of friends and appreciation of their company. This piteous cry only lasted for a month, as on October 5, before the buzzard was quite three months old, he became entirely silent, moped, and fasted for six days in succession. His despondent mood lasted for five weeks, and only once in all that time would the Hawk come to me for food, although he occasionally ate what was brought to him. He seemed quite indifferent to the society of a young Ferruginous Rough-leg (*Archibuteo ferrugineus*) which was confined with him. Here was indeed a change in the former screaming, voracious bird, which, if at liberty, flew boldly to me and clung to my clothing when I appeared with meat. He now shrank into himself, ceased all friendly overtures, and watched his companion feed unmoved. Not until November

¹ Birds of the Northwest, p. 358.

12th did he regain his high spirits and enormous appetite. I, of course, attributed the change to the migration impulse, but although the dejected buzzard escaped during this period he allowed me to retake him after three short flights. From three months old onwards his ordinary call was a very soft low whistle, nor did he ever scream except when pretending to guard his food.

During the winter the buzzard was kept in the house in a large cage, as I thought the barn would be too cold for him. The bird had engaging ways, and when anxious for food, which would be taken either by day or night, descended from his perch to that corner of his cage nearest the kitchen, where he stood whistling softly until supplied. Every evening at sundown he became restless for a few moments, flapped his wings, and made efforts to fly, which is, I believe, a characteristic of most cage birds at roosting time. In sleeping it was quite exceptional for him to put his head under his wing. On calm fine days the buzzard was liberated for out-door exercise but seemed afraid of wandering too far from home. Until he was a year old he had never been known to fly further than about two hundred yards, and only once into a tree when frightened by a dog. In 1909, I noticed the first appearance of Swainson's Hawk on March 28, and on March 30, my tame bird again became subject to a fit of depression.

(To be continued.)

THE FOX SPARROW AS A SONGSTER.

BY ROBERT THOMAS MOORE.

DURING those brief March days, when he slips through our thickets, the Fox Sparrow sings so sweetly that we conclude he is doing his best. Not until we have heard his finished songs leaping out of the Canadian woodlands and sounding a riot of pure joy, as they are tossed from hill to hill, do we realize how much injustice we have done him. For those migrant strains, even at their best, are mere beginnings, the timid tuning up of the vocal instruments for the great song-fest to come. The fact is the migrant songs, which I have heard, lack nearly every quality which makes the finished product the great song it is. Loud as the former seem, their power is as nothing compared to that which propels the northern challenge, even the tone quality is defective, lacking in full depth and roundness, and most vital of all the dancing rhythm with its powerful central accents, which gives the northern songs the expression of irrepressible joy, is entirely absent. To appreciate this, one must go as far as the Magdalen Islands in the Gulf of St. Lawrence, for these islands mark the southern limit of nesting Fox Sparrows.

With this purpose in view, I found myself on June 15, 1911, at Pictou, N. S., ready to take the biweekly steamer across the eighty miles of gulf waters. Much to my surprise neither there nor in Souris, Prince Edward Is., did I happen on a single individual of this species, yet the following day in the Magdalens, only sixty miles farther north, I found it one of the most common birds, exceeded in abundance only by the Savannah Sparrow and the Blackpoll Warbler. From June 16 until July 5, with the exception of six days on Bird Rock, several hours of each twenty-four were spent with the Fox Sparrow and some days were given up to him entirely. During this period we went to various portions of the islands from East Point to Grindstone, a distance of forty miles and more, and the records secured are therefore representative. Each new region brought to light some variations, but these were slight, the main features remaining unchanged. Wherever we

went, as long as we kept to wooded districts, we were bound to find this robust sparrow and there he would be the loudest, most constant and most conspicuous songster. Ubiquitous as he was, it was not an easy matter to secure complete records of his songs. The difficulty was not with his pitch, which is very true, nor with his tones, which are free of "burred notes," but with the contrast of intensity in the songs themselves. These consist of such a variety of extremely loud and soft sounds that one must get within ten feet of the bird to hear every one distinctly, a difficult problem with any songster, especially one rather shy of intrusion near his song-site. Despite this I secured a number of records, most of which (Nos. 4 to 12 inclusive) are exact representations and the rest lacking only insignificant notes. I have also a large number of fragments such as No. 1, which are of almost equal value in determining universal characteristics. Besides these I heard a great number of songs, which so closely resembled records 2, 5 and 9 that it seemed useless to note them. These three records are the most distinctive and are typical of the great majority of Magdalen songs. To this class belonged some of the most beautiful and longest ones I heard, in fact the records do not represent the length of the best Fox Sparrow songs. Some of them were quite intricate and were purposely avoided until the shorter ones had been mastered. At this point the expedition to Bird Rock intervened and our return on July 1 found the song-season on the wane and the songs curtailed to their central themes. Records 6, 7 and 11 are instances of this and all, except 4 and 5, were obtained during this waning period. Nevertheless they are adequate for the purpose of this article, which is to give by the help of their illustrative value some idea of general characteristics, rather than exact musical representations of the best this finch can do.

The song-sites of the Fox Sparrow are conditioned by his habitat. Wherever there are low evergreens massed in dense clumps — and this is the condition of a large part of the Magdalen woodland — there he will be found. It makes no difference whether those clumps abut on inland fields or front the storms on some precipitous headland, out along their edges these sturdy finches are bound to be and will be heard at all times of the day, be it sunlit or foggy. Each individual has his own particular clump and one

1 2-8va

2 132-f 2-8va

1a 2-8va

3 96-f 2-8va

4 150-f 2-8va

5 100-f

6 104-f 2-8va

7 104-f 2-8va

8 120-f 2-8va

9 84-f 2-8va

11 2-8va

10 226-f

11 104-f

12 2-8va

13 152-f 2-8va

or more song-sites in that clump, so that it is possible to go out day after day and find the same songster and hear the same song. Sometimes his favorite tree is five feet high and sometimes twenty, ordinarily it is ten, and whatever its height, it is usually a spruce and is always on the edge of the clump, now facing an inner open space, or again the outer world and other songsters. His favorite song-position on the tree is its tip. A point a foot below may be chosen, but never the lower branches and by no means the ground.

The last place is the region of his nest and from there no sounds are issued except call-notes. These consist of two kinds quite different from each other and neither musical. The most common is an explosive aspirate, which may be indicated by the syllable 'chech' and is as loud as the call of the Hermit Thrush. The second is a fine, high-pitched note, which closely resembles the call of the Savannah Sparrow. The former is heard much more frequently and in conjunction with the latter is employed to protest against intrusion near the nest. It is to protect his treasures that he drops to earth or else to help his mate in solving nest-problems, but he cannot stay there long; the impulse towards expression is too strong and he is soon back on his song-site.

On the other hand he does not like to sing alone and, if his first three or four efforts are not answered, he will dive back to his mate. In like manner, when several birds are singing, and one suddenly stops, the rest become discouraged and one after another follow him to earth, although they may be a long distance from each other. Down they go together and after a bustling ten minutes with their mates, almost together they return. On several occasions I watched a single bird start a whole song-group. Cautiously he flitted upwards from limb to limb taking a minute to reach the top, then, when a careful survey had convinced him of safety, the bill raised, the eyes filmed and out across the valley rang the dancing challenge. The last note tossed off, the bill dropped again, the eyes brightened to alertness and the head cocked sidewise into a listening attitude. A minute might pass without the challenge being answered, when it was sent once more ringing over the hills so powerfully, that even a human might have heard it a half a mile. Almost always the second challenge brought a response from the opposite hill and thereafter reply and answer shot back

and forth, allowing plenty of time for pause and effect. Soon a third bird seized a moment of silence and turned the duo into a three-cornered affair and once I noted four rusty-coats shooting up their songs alternately like so many rockets from as many hills. This was not a single instance, but the customary way in which after an intermission song was resumed. Of course I do not mean to assert that Fox Sparrows are always so decorous and never interrupt each other, for they do at times during the day and more often at sunset, when there are too many songsters for each to be respectful. Even then the singing is not chorus fashion, for the tendency toward alternation is still preserved, though one bird often begins before another has finished. What I wish to state is this, that each Fox Sparrow is influenced by all others of his kind within hearing, that he certainly listens to their performance, and that this habit of listening has tended to produce an alternation of song, which generally results in the antiphonal effect of answer and reply.

That this influence is something more than mere accident or sentiment, is brought to light when the songs are studied from a musical standpoint. Records 2, 3, 4, 5 and the fragment 1 were sung from the hills surrounding one valley near Grosse Isle by five different birds. No two of these were more than a third of a mile from each other and therefore, if birds have even as good ears as man, within easy hearing distance. Three of their songs, Nos. 1¹, 2 and 3, were secured the same afternoon, when these three birds were taking part in an alternating trio, during which each bird sang, listened and waited his turn. On other afternoons the authors of songs 4 and 5, were heard answering each other for long periods of time and on still others No. 5 answered members of the first trio. Now the interesting fact is this, that all five of these songs are in the *same key*, Db, and three of them use precisely the *same sounds* for their three most important notes, those marked by brackets. This phrase, as will be shown later, is the backbone of every song, its loudest portion, and therefore being

¹ This phrase was only a small portion of the song, the rest of which could not be obtained on account of the bird's shyness. However it was the most important part and, as it is identical with the similar portions of Nos. 2 and 5, it seemed worthy of insertion.

heard farthest, is most likely to be exactly imitated. The following day at Grindstone, twenty-five miles from Grosse Isle, songs 6 and 7 were heard in close proximity, using likewise a common key *E^b minor*. In this case the same time and almost identical notes were employed, and yet both notes and key were totally different from those of the Grosse Isle birds. This sort of thing I noticed a number of times, in fact every time the birds of a group sang long enough for me to pitch their songs and secure evidence. For instance records Nos. 8 and 9 are also in a common key and were rendered by birds whose song-sites were close to each other, though the birds were not heard on the same occasion. In the case of bird No. 8 I was witness of an interesting incident. As I was writing down his notes, another Fox Sparrow flew up to a spruce opposite and answered him in the same key and with almost the identical song. After singing it three or four times in an uncertain fashion, he broke out confidently into an entirely different melody, more resembling No. 2, but still keeping in key *D* of song 8. Unfortunately he stopped singing before I had time to record his song. This was the only occasion when I heard a Fox Sparrow sing two songs, for unlike the Song Sparrow, the Fox seems to have but one and is content to repeat it over and over, making slight additions at the height of the season or reducing it at the end note by note to its melodic skeleton. This case was probably not a clear instance of two songs, but a momentary lapse, merely indicating how one bird is influenced by another and his songs gradually modified. One other case is enlightening, that of Nos. 10 and 11, whose authors answered each other constantly. These two birds did not sing in the same key, yet their songs contain common sounds and are so closely related that one makes a beautiful finish¹ to the other. Furthermore both of these songs contain trills, very unusual features in the songs of this species. In each of these four groups there were more birds whose songs I was not able to record. Here then were four sets of Fox Sparrows, each set separated by several miles of territory and each exhibiting remarkable similarities within the group and variations without. Just

¹ To show this relation I have placed Song 10 between two renditions of No. 11 and have added an accompaniment which, of course, was not sung by the birds!

as we would expect, the most distant groups display the greatest divergences, the songs of Grindstone, for instance, manifesting a tendency toward ornamentation, such as trills, rests and grace notes and being rendered in four time, whereas the songs of Grosse Isle are plainer and usually in three or five time.

Having noticed these similarities within the groups, we are next concerned to discover those characteristics which are constant in all Fox Sparrow songs. It has already been intimated that he is not at all particular whether there are 2, 3, or 5 eighth notes in a measure; equally indifferent is he to the use of grace notes, dotted notes, staccato notes and trills, which may or may not be present. Sometimes he will satisfy the demands of human music by returning at the close to a note of the common chord, with which he started, or again he will end aimlessly as in records 6 and 7 or ask a positive question as in No. 8. Furthermore he occasionally slips into minor keys (Records 6, 7, and 11), a most unexpected lapse, when one considers what dancing movements of joy his phrases are. But despite this inconstancy there are certain fundamental characteristics which never change. First, the quality of tone is always round and full, like the sound of a clear flute-note. It is not rendered ambiguous by what Mr. Schuyler Matthews calls "burred tones," on the other hand it is not enriched by those overtones, which make the notes of the Wood Thrush so ethereal. It is decidedly human without touch of heavenly rapture, just a clear full tone, which is precisely the best medium for a message of joy and the most invigorating imaginable. A second invariable characteristic is the medium pitch of the songs and here the Fox Sparrow differs from the Hermit Thrush and many of our greatest songsters, who climb to such shrill heights that one sometimes doubts their sense for beauty.¹ Our more sensible finch does not sing a note which a human being cannot whistle and all of them are pitched in those last two octaves of the piano, which seem to be the most satisfying region for the expression of bird-music. In the third place every song is extremely loud at least in its fundamental sounds, so that it can be heard half a mile. Sometimes the

¹ Nevertheless we must not forget that what is beautiful to our ears, may not be to a bird's, and vice versa.

whole song is loud, as in No. 2, but as a rule only the central phrase while the beginning and end are soft. A fourth characteristic is subject to little change: the rate of time is always fast, and I say this notwithstanding that record No. 9, my slowest record, was sung only about half as fast as No. 13, for the former was in great contrast with the majority of the songs, which ran nearer to the speed of No. 13. Some of the songs, which were not secured, went even faster and were rung off at such extreme speed that they could hardly be imitated by a human whistler. It is this speed which gives the songs their lively character. There is then practically no variation in these four relations,—quality of tone, pitch, intensity and time and these are the fundamental relations of music.

When we come to the study of more general characteristics, we find there are others which are practically constant. As a whole the Fox Sparrow's song may be described as follows: it opens with two 'checks,' the low call-note, much like the Hermit Thrush's beginning, then the main song starts high and soft and bursts forth into extremely loud sounds, accenting heavily a characteristic falling phrase of three notes and finally ends as soft as it began, but usually at lower pitch. It may also close with two high call-notes of poor musical quality. The opening and closing call-notes are indicated as near as possible to the proper pitch in record No. 5. All the songs of Grosse Isle, at the height of the song-season, except No. 4, possessed them. Their absence from records 2 and 3 is due to the fact that in these the exact pitch could not be determined. These notes are not, however, important, but the central phrase is. It is the most noticeable part of the song and always consists of a sharp drop in pitch from the first note to the second and a subsequent slight rise from the second to the third. The drop may be a 'fifth,' 'fourth,' or 'second,' but the rise is almost invariably a half tone. Each one of the three is accented just as heavily and sung just as loud as the other two and, except in No. 1, each tone is given the same amount of time. Throughout the records this phrase is indicated by brackets above the score. Ninety-five percent of the songs have it, I should judge, and the rest rudimentary traces. In fact it was so characteristic that I got in the habit of disregarding songs that possessed it and recording all that evinced tendencies to do away with it. The result is, I have such records

as No. 7, where the drop is turned into a triplet of three sounds, Nos. 3 and 12 where it is doubled, and Nos. 4 and 8, where it has almost disappeared. These are the only instances and against them I heard hundreds, which were all rendered in the positive way No. 9 is. Indeed all my fragments consist without exception of this fundamental phrase and whatever else could be secured before the bird ceased singing. This phrase was obtained invariably before other sounds, because it stood out so conspicuously. It is always the loudest portion of the songs, if there is any change of intensity, and yet the prelude soft notes never approach it by means of crescendo. When they have danced the melody up to this point, it simply *bursts* with startling suddenness into the phrase, showering extravagant accents on all three notes. Mr. Cheyney has used the rocket illustration to record his impression of the Hermit Thrush's song, but it can be more fitly applied to the Fox Sparrow's, though the rocket in this case travels horizontally. It starts in mid-sky and darting along with scintillating but suppressed power, suddenly flares out with the accompaniment of dazzling light and triumphant sound; then there is a mighty drop and exultant recovery and a final sputter as it leaps into silence.

To use a term of psychology this central theme is the song's *point of orientation* or the part which invariably compels attention first. One might call it the recognition-phrase of the species, certainly for human ears, and possibly for birds'. Over and over again I heard Fox Sparrows' songs far across the hills and always this phrase alone had sufficient carrying power to be audible, yet it was adequate for the immediate identification of the song. And I think it would be an unconscious recognition-note even for bird-students, who are not musical and could not define it in musical terms. Of course more obvious to them would be the loudness of the song, its speed and the flute-like quality of tone. To the birds also it seems fundamental, for as I have shown, it is the only phrase of the song which remains constant. But I have another bit of evidence, which ought to be convincing. During July when all other notes are dropping off with the waning song-season, this central phrase is kept intact to the very last. Records 6 and 7, secured July 3, show this and more so No. 11, obtained the same afternoon. The last contains only one sound more than the three

of the phrase, and yet that one was sung very soft, while the others were propelled with the same power they had been in June. In connection with this I might mention an incident, which may or may not be considered evidence, though it does prove how birds are influenced by songs about them. I had been endeavoring to get near enough to record the softer tones of the shy author of fragment 1. This bird and some of his song-group not recorded, were singing the central phrase in a peculiar jerky fashion, giving the first note twice as much time as the second. After a few minutes a new songster entered the group, who sang these three notes in a hoarse, hard tone and in lower pitch (see record 1A), and sang no other notes whatever. Stealing up, I was astonished to see a Robin uttering the rasping sounds. Instantly he flew away to the next clump of trees and sang the rollicking song of his kind, but still in hoarse quality.

To me the Fox Sparrow stands out as the singer of joy. Many birds are of this kind, but few are to such a degree as this inhabitant of the stunted woodlands of the North. The musical construction indicates it, for instance the dancing rhythm, the major keys, and the speed with which it fairly shoots through the central phrase. But deeper than these are certain qualities in his physical being and character, which make for happiness: his robustness and virility, his excessive activity in all his waking hours. As evidence of his energy it has been stated that he sometimes scratches with both feet in concert, but my observations indicate that he always does this and that this accounts for the clatter he makes among the leaves. At any rate his energy is quite as strenuous as that of his cousin, the Chewink, whether he is tossing the leaves in search of food or defying the northern fog with his buoyant song. Under no circumstances is he depressed! Evidence of this we obtained repeatedly in the Magdalens. Most every day it rained and even when the sun shone, it was a common occurrence for fog to creep in from the sea and resume full sway. Other birds stopped singing, but not the Fox Sparrow! His song rang out just as buoyant and golden as when sunlit; indeed there was a suppressed eagerness about it, as if it were contesting the supremacy of the mist. Now this is surely optimism and, when one takes him all in all, it is as an optimist that he attains highest rank. As such one

must compare him with birds like the Mockingbird, Thrasher and Winter Wren, all of them singers of the joy of life. None of these, famous as they are, possess as fine a tone as the Fox Sparrow's or revel in such matchless melodies. The Mockingbird and the Thrasher repeat over and over insignificant phrases of from two to five notes, until one wearies of waiting for a real melody. Even the rippling melodies of the Winter Wren are spoiled by jerking rhythm and acrobatic antics. But the Fox Sparrow is almost beyond criticism. His is a dignified manner, a big voice, a fine tone, a consummate sense of rhythm and a splendid series of dancing melodies.

Having praised him so much, one must compare him with his great relative, the Song Sparrow, our finest melodist. And here our larger finch must take second place in one thing and that important: he lacks versatility. Each individual has but one song and any song however fine it may be, is bound to weary after much repetition. The Song Sparrow on the other hand is master of innumerable melodies and every one of his kind has a large repertoire. In no other department of music, however, is the Fox Sparrow inferior. His tone is finer, his voice is bigger and pitched lower, so that it is a more mellow medium for the expression of sentiment, and finally his melodies themselves, though not so various, are more elaborate, interesting and affecting. To tell the truth the Fox Sparrow's song is not at all sparrow-like and bears only a faint resemblance to the larger finches. In nearly every way he is more like the Thrushes, particularly the Hermit, with whom he has a remarkable affinity. He chooses the same sort of song-site, he mounts to it in the same cautious way, throughout the song-period he exhibits the same calm dignity and his rusty coat and large size contribute to the striking similarity. The song itself opens with almost identical call-notes, is followed by a similar contrast of soft and loud tones and in a general way is the same sort of prominent, ringing compelling music. Strangest of all the tone quality, though not quite so rich, is so similar that the first few days in the Magdalens, I mistook it at a distance for the Hermit's! Later study of song-construction made it possible for me to distinguish this song at any distance. It is in song-construction that the Hermit is his undoubted master, as he is of all other birds.

The marvelous harmony of his many phrases places him at once in a rank by himself and forces us to drop a dubious comparison. Still the Fox Sparrow is likely to win a more affectionate regard from the majority of bird-lovers, on account of his brighter music, dancing forth as it does in a perfect abandon of joy. At any rate he is the master songster¹ of the Magdalens and particularly acceptable in that sea-world, whose history is bound up with shipwreck and whose customary music is the buzzing of Savannah Sparrow, rasping of Rusty Blackbird, quavering of Wilson's Snipe, pumping of Bittern, rattling of Rail, croak of Raven, and mocking laughter of the Loon.

CONCEALING ACTION OF THE BITTERN (*BOTAURUS
LENTIGINOSUS*).

BY WALTER BRADFORD BARROWS.

THE adaptive, concealing or protective coloration of the common Bittern is so well known to all ornithologists and to most other bird lovers that it hardly needs mention here. It is also a matter of common observation that this remarkable bird has the habit of standing motionless for minutes at a time with its legs, body and outstretched neck all in the same line, the bill pointing directly toward the sky. In this position, with the wings and feathers of the trunk pressed closely to the sides, and perhaps the body itself somewhat flattened, the bird, at least from the usual point of view, closely resembles a weather beaten strip of board, a dead and bleached stub, or even a rather bulky last year's stalk of cat-tail flag.

In my own experience this attitude of the Bittern seems to be assumed most often immediately on alighting, and then after holding this rigid position for a few moments it rather quickly

¹ The Hermit Thrush is only locally distributed and uncommon in the Magdalen Islands.

draws down its head and neck into the more graceful position of a feeding heron and proceeds to walk about deliberately in search of food.

A few years ago I had an opportunity of observing closely one of these birds which exhibited a refinement of this concealing action which was entirely new to me and seemed indeed so remarkable that I hesitated to publish it until the literature of the subject had been searched with some care, and effort had been made to detect other individuals using the same device. The observation referred to was made on the campus of the Agricultural College, in Ingham County, Michigan, in August, 1905, on a Bittern which was found in an artificial pond in which water lilies, wild rice, narrow leaved cattails, sedges and some other water plants were growing. The pond was something less than one hundred yards in length and of irregular form, the widest parts, however, not more than fifteen or twenty yards across.

While at work in my office, in the middle of the afternoon, Mr. U. P. Hedrick, then professor of horticulture, came in breathlessly with the information that a large water bird had alighted in the lily pond and could be collected readily if wanted for the museum. Hurrying back with him to the edge of the pool the bird was nowhere to be seen, although we looked carefully in the place where it had been standing less than five minutes before. Skirting the water with some care and scanning every cluster of water plants on the way, we passed completely around the pool, returning at length to the point where we had first reached it, still without discovering the bird. The afternoon was bright and warm with a rather fitful breeze, there were few shrubs about our end of the pond, the water plants were not thick enough to hide a blackbird; it seemed certain that the bird had flown away.

As we stood talking about its disappearance, however, and while I was questioning my friend who is not an ornithologist as to its size, color and action, it suddenly appeared standing motionless and in plain sight at a distance of less than fifty feet, in water only a few inches deep and among scattered cattail flags which were nowhere close enough together to offer any real concealment. The bird, an adult Bittern (*Botaurus lentiginosus*) was in the characteristic erect and rigid attitude already described and so near to us that its yellow iris was distinctly visible.

Apparently both of us discovered the bird at the same instant and involuntarily gave exclamations of surprise that it had not been seen before, while my companion at once declared that it was within a few feet of the spot where he had left it when he came to call me. I told him what the bird was and called his attention to the protective coloration and posture; then, as we stood admiring the bird and his sublime confidence in his invisibility, a light breeze ruffled the surface of the previously calm water and set the cattail flags rustling and nodding as it passed. Instantly the Bittern began to sway gently from side to side with an undulating motion which was most pronounced in the neck but was participated in by the body and even the legs. So obvious was the motion that it was impossible to overlook it, yet when the breeze subsided and the flags became motionless the bird stood as rigid as before and left us wondering whether after all our eyes might not have deceived us.

It occurred to me that the flickering shadows from the swaying flags might have created the illusion and that the rippling water with its broken reflections possibly made it more complete; but another gentle breeze gave us an opportunity to repeat the observation with both these contingencies in mind and there was no escape from the conclusion that the motion of the Bittern was actual, not due to shadows or reflections, or even to the disturbance of the plumage by the wind itself. The bird stood with its back to the wind and its face toward us. We were within a dozen yards of it now and could see distinctly every mark of its rich, brown, black and buff plumage and yet if our eyes were turned away for an instant it was with difficulty that we could pick up the image again, so perfectly did it blend with the surrounding flags and so accurate was the imitation of their waving motion. This was repeated again and again, and when after ten or fifteen minutes we went back to our work, the bird was still standing near the same spot and in the same rigid position although by almost imperceptible steps it had moved a yard or more from its original station.

During the seven years which have elapsed since this occurrence I have improved every opportunity to watch for a repetition of this action, but thus far in vain. Many times I have had Bitterns

within sight and at short range, but the conditions never have been such as to favor the recognition of such motion had it existed. In one instance, in July, 1911, I watched a family of three young Bitterns more than two thirds grown which assumed the upright and rigid attitude as perfectly as the adults, except that they walked about more freely but without relaxing the strained position in the least. All the time, however, they kept their bodies almost completely hidden in the coarse grass and even the necks were so obscured by the tips of the grass that when this was set in motion by the wind I could not tell whether the neck remained quiet or not. The birds in this case occupied a little grass covered island in a muddy pool so that I could not readily get nearer than about thirty yards, and even with a six-power field-glass it was impossible to settle the question.

A somewhat careful examination has been made of American bird literature without finding any reference to this peculiar action, but the search has been by no means thorough. I have also examined such accounts as I could find of the action of the closely related European Bittern (*Botaurus stellaris*) without finding any reference to a similar performance, although the accounts and figures would lead one to believe that in voice and attitude as well as in general habits this bird closely resembles our own.

BIRD MIGRATION FROM THE STANDPOINT OF ITS
PERIODIC ACCURACY.

BY JOHN C. PHILLIPS.

ONE must confess to a feeling of trepidation on entering into such a dangerous field of discussion as bird migration, especially in its theoretical aspect, for perhaps no scientific subject has been so flooded with wild speculation, dogmatic assertions and poetical fancy. This is natural, because the facts cannot fail to come to the notice of every lover of nature, and their æsthetic quality makes them attractive material for thought and discussion.

Bird migration touches many interesting provinces of science, such as zoögeography, geology, meteorology, evolution and comparative psychology. What has recently excited the writer's curiosity is the meaning of the time sense of certain species of birds, especially where such an accurate sense does not seem to be warranted; in a word, where it seems more highly developed than is compatible with adaptive necessity.

In the past decade many of the facts of migration have become common knowledge, but when these facts are completely grasped, and even when the movements of the individual bird have been thoroughly studied, *the* great problem of migration is likely to remain as much unsolved as ever, for the sense on which distant orientation depends, and the instinct which starts the travellers are beyond the reach of our present methods of investigation. Instinct itself is of course the fundamental problem, a problem as deep and obscure as any in the realm of philosophy. Bergson says: "*The intellect is characterized by a natural inability to comprehend life.* Instinct on the contrary is moulded on the very form of life. While intelligence treats everything mechanically, instinct proceeds so to speak organically. If the consciousness that slumbers in it should awake, if it were wound up into knowledge, instead of being wound off into action, if we could ask and it could reply, it would give up to us the most intimate secrets of life."¹

¹ Bergson, *Creative Evolution*, p. 165.

But though the nature of instinct is so far beyond us, the direction of its efforts can be studied, and as far as the writer can see they are held by students of animal behavior to be of a purposeful and adaptive nature; if not for their present needs, then possibly through persistence they may show a glimpse of what was their past necessity or specialization. Comparing instinct with intuition Bergson says again: "Without intelligence, it (intuition) would have remained in the form of *instinct*, riveted to the special form of its *practical interest* and turned outward by it into movements of locomotion."¹ (Italics mine.)

Holmes says: "Salmon begin their up-stream migration, the male frog develops his tendency to clasp the female, birds herald the advent of the breeding season with courtship and song, and the males of many mammals show at this season an unusual degree of belligerency. The change in instinctive behavior during the breeding season may be due to the production of internal secretions which influence the irritability of certain parts of the nervous system, but however caused, it is, like the varying responses to food, water, etc., *pretty closely subservient to the needs of the species.*"² (Italics mine.)

In the same vein we might quote from Lloyd Morgan who in contrasting reflex with instinctive actions, says of the latter: "Instinctive activities are those organized trains or sequences of co-ordinated activities which are performed by the individual in common with all members of the same more or less restricted group, in *adaptation to certain circumstances*, oft-recurring or *essential to the continuance of the species.*"³ (Italics mine.)

Whether we regard migration as the operation of a pure instinct, or complicate it with reflex action brought about by various tropisms, and even influenced by a certain element of choice (intelligence), we must admit, I think, that its foundation is adaptive and useful. It is true that it is often difficult to see why bird migration has been so persistently carried on, especially in cases where part of the individuals of a species are local in their habits and part are migratory, for no reason that seems a necessity, but this is very

¹ *do.* p. 178.

² Holmes, *The Evolution of Animal Intelligence.*

³ L. Morgan, *Animal Life and Intelligence*, p. 422.

likely analogous in a certain way to evolution of form, which as embryology shows us so well, is forced into the repetition of ancient and disused types.

Professor Wheeler in his book on ants gives a very concise discussion of instinct, with some excellent definitions. He points out various grades of degenerating instincts in these animals, some of which can be brought back into activity under proper conditions. According to him, instinct, "the combination of complexity with automatic fixity," has been studied from four different points of view, ethological, physiological, psychological and metaphysical. We are naturally concerned now mostly with the physiological side.

We must bear in mind that the regularity of instinctive behavior has probably been somewhat exaggerated, and as Jordan says, an instinctive action is subject to variation like all other characteristics of animals.

Individual birds show peculiarities of behavior in nest building, song and other actions. Hodge has shown that a great difference in power of orientation exists for homing pigeons. Also, in animals as high in the scale of life as birds, there cannot fail to be some "power of choice" in almost every stereotyped activity.

This brings us back to our enquiry into the mechanism by which birds are enabled to arrive each year at a given locality at almost exactly the same time. From a physico-chemical standpoint the accuracy of time sense in certain species is little short of marvelous and is well shown in the familiar Baltimore Oriole and the Bobolink, which are both late arrivals in the north. Mr. Brewster very kindly allowed me to see his notes on the arrival of these species at Concord, Massachusetts, for long periods of time. From 1900 to 1911 his earliest record for the Bobolink is May 3, and his latest May 11. For three years the arrival was May 8, and for two years May 7; the average being May 7. Just as remarkable is the Oriole at Concord. From 1900 to 1911, the earliest is May 3 and latest May 14. The average is May 8, and the species appeared twice on this day, twice on the 9th, once on the 7th, and once on the 6th. An earlier period including the years '86, '89, '90, '91 and '93, gives the average date of the Oriole near Boston as May 6, with the greatest variation at six days.

Examples of this great potential accuracy could be multiplied indefinitely, but we will confine ourselves to some of the most striking. Cooke's report of Bird Migration in the years 1884 and 1885 bear out the wonderful uniformity of progression of the Oriole. Cooke says¹: "Were the surface of the earth level and the climate absolutely uniform, birds would arrive at a given place on approximately the same day each year. . . . In the records of the Biological survey the best example of uniformity in arrival is that of the Chimney Swift at New Market, Va., as noted by George M. Neese. The dates of each year from 1884 to 1906 are respectively, April 16, 16, 15, 16, 16, 11, 9, 15, 21, 14, 15, 14, 12, 7, 16, 14, 16, 12, 11, 9, 12, 12, 10."

Dixon² quotes the case of the Puffins which arrive at St. Kilda very regularly on the first day of May, while the Bartailed Godwits reach the south coast of England so near a certain date that the twelfth of May is known as 'Godwit-day.'

Think for a moment what this means; a start from a more or less changeless climate, where environmental stimuli can hardly account for any of the accuracy we have pointed out, with a journey of two thousand miles or more, fraught with innumerable variations in wind, precipitation, food supply, etc., and in the case of these first instances, an arrival at Boston, estimating the total journey to occupy about two months, with an average error of only 9%. This is comparable to a train being thirteen and one-half minutes late in a journey of one hundred miles at forty miles per hour. Yet if we take into consideration that the bird has no watch to start on, we ought really to figure its possible error of spring arrival as the per cent of its total sojourn in winter quarters, plus the time of its northern journey, which total period must be reckoned to be nearly eight months. This gives us an error of only 2.4%. With the case of the Chimney Swift the actual average error as Cooke remarks is only 2.2 days in the whole period of twenty-three years.

It is natural that a very exceptional season, such as the cold May of 1907, may have a very marked effect on bird arrivals.

¹ The Migratory Movements of Birds in Relation to the Weather. Year-book of Dept. of Agric., 1910, p. 386.

² Dixon, *The Migration of Birds*, 1897. p. 134.

Eifrig's observations at Ottawa, Canada,¹ show that this exceptional season delayed some birds, like the Hummingbird, for two weeks, while other species were very little affected. This, however, only means that the racial accuracy of the species was forcibly interfered with from outside, in some cases far more seriously than in others.

We must, however, now consider another side of the question. So far we have been dealing with 'first arrivals.' What we should like, of course, would be individual arrivals, but until we have some definite information on this point, which can only be supplied by the return of banded birds to nesting sites, we must content ourselves with the consideration of the possible errors in recording first arrivals, and also with the highly interesting 'bulk arrivals,' or dates of greatest frequency of transient migrants.

The question of the error of first arrivals has been discussed by Messrs. Stone and Cooke. Stone found² that many eyes were better than one, and Cooke³ states that where one observer was operating, his dates of first arrival were apt to be over a day late on an average. Cooke's method of averaging migration arrivals⁴ consists in throwing out dates which are more than six days out of the way, his experience teaching him that "birds seldom vary on account of the season more than six days either way from the average date of their arrival." This method may seem to some, as to the writer, rather arbitrary.

Mr. Stone gives a good discussion of the problem of recording early arrivals in the 'Proceedings of the Academy of Natural Sciences of Philadelphia' for 1908. In it he shows that to get at the actual date we must combine the records of many observers at different points a few miles apart, and combine them in certain definite ways, so as to throw out stations in which individual error or incompatibility of surroundings delayed the detection of the species in question. By 'bulk arrival' Mr. Stone means the date on which the species has arrived at half the stations in a given restricted area. He regards the bulk arrival, or greatest frequency as recorded only

¹ Auk, 1908, p. 1.

² Stone, W., Condor, 1906, p. 88.

³ Cooke, W. W., Auk, 1907, p. 346.

⁴ Cooke, W. W., Auk, 1908, p. 485.

by a single observer, as much too variable a quantity to be of practical use. By his methods of estimating the dates from year to year he obtains an extraordinarily slight arrival variation.

Thus it is probable that ordinary dates of arrival as given by single observers increase rather than diminish our knowledge of the actual potential accuracy of the species.

In 'Cassinia' for 1911 arrivals in the Philadelphia region are tabulated for the years 1906-1911. Below are given in a table four species which are remarkable from our point of view. The figures are the actual departure in days from a ten year average for the species. They are based on Mr. Stone's 'bulk arrival.'

	1906	1907	1908	1909	1910	1911
Yellow Warbler	0	0	+4	-2	0	0
Ovenbird	0	0	+4	-1	0	-2
Baltimore Oriole	+2	-5	+4	-1	-3	-2
Canadian Warbler	0	0	-1	+1	-3	+1

In glancing down the 'Cassinia' table one sees immediately that groups of species arriving at nearly the same time are often very similarly affected by the season, and will be either late or early according to the year. Within the same year, however, the early or March migrants may be affected in an opposite direction from the late migrants; thus early species may be late and late species early, for the same season. This is merely more evidence to show that at least some of the observed arrival error is meteorological rather than instinctive; and external instead of internal.

In the same paper Mr. Stone notes that in computing the ten year averages it is interesting to see how the average of 'bulk arrivals' based on the method given above, coincides with the average of first arrivals at stations where there have been a number of accurate observers. On page 47 is a table which shows the 10 observation stations near Philadelphia, with dates of arrival for 9 common birds. The 'bulk arrivals' here are either the same or only *one* day later than the average first arrivals.

Taking a single species, the Brown Thrasher, a bird easily seen and almost impossible to identify wrongly, the ten year arrival records are given in detail. For this period there are 10 stations and 22 observers at work. Each of the stations has its own average and the greatest error is +2 days at George School, and -3 days

at Concordville. The Grand Total is April 22 for first arrival, while the grand computed 'bulk arrival' is April 23 for the entire period. This shows that first arrivals are not mere stragglers, for if they were, the records of the different Philadelphia stations would not give such uniform results.

In Stone's 'The birds of Eastern Pennsylvania and New Jersey, 1894' are given lists of arrival at Germantown, Pa., for 50 species from 1885 to 1892. Those showing great constancy are the Chimney Swift, Baltimore Oriole, Barn Swallow, Yellow Warbler, Blackpoll Warbler, Oven-bird, Redstart and Catbird. These records of course are not the work of so many observers as the 'Cassinia' records.

For the period 1893-1900 there is another set of arrival records¹ which shows as very accurate birds, the Chimney Swift, Baltimore Oriole, Barn Swallow, Wood Thrush and others. We note that the same species come up with accuracy performances at different times and in different localities.

Mr. Brewster² has called attention to the probable dependence of species upon each other for purposes of guidance. He shows how flocks are made up of many species and how rare stragglers are always found in the company of other species. He also mentions the case of lost birds, that is, rare stragglers, almost always turning out to be the young of the season. It is of course apparent that many species migrate together. On the great May rush several species arrive each day on an average. From the 'Cassinia' table of 1911 we get 4 species on May 4, 2 May 5, 2 May 6, 1 May 7, 5 May 8, 2 May 9, 1 May 10, 2 May 11 and 2 May 12. This refers to common species only, exact dates for rare birds being much harder to compute. But however dependent species are upon each other during their journeys, we cannot escape from the fact that each has its characteristic time period, for if it did not, we would get a very different picture of migration. The birds would then come in great scattering waves, transient migrants would be longer in passing a given point, and the whole phenomenon would lose much of its present orderliness. Of the 14 common Hunga-

¹ Cassinia, 1901, p. 37.

² Memoirs of the Nuttall Club, No. 1, 1886.

rian migrants to be referred to later, no two fall upon the same day. They begin with *Alauda arvensis* on February 28 and end with *Coturnix coturnix* on April 29.

There is much to be learned as to the nesting localities of late and early arrivals inside a given species. It is certain that some birds wintering in Central America arrive in temperate summer haunts and begin nest building almost before others of the same species start from winter quarters bound for sub-arctic regions, the north bound birds starting later and traveling faster.

As Cooke remarks in speaking of the Robin¹ "The first robins that reach a given locality in the spring are likely to remain there to nest, and the advance of the migration time must await the arrival of other birds from still farther south. Therefore each robin undoubtedly migrates at a faster rate than the apparent movement of his species as a whole. This is true of most, if not all, of the other seemingly slow migrants."

We may now refer to the most elaborate study of migration yet attempted, that outlined by Otto Herman in Hungary² and given in 'Aquila' from year to year. Enormous numbers of stations are in use and stress is laid on the common species. It must be confessed however that the actual significance of these records from our point of view is hard to determine because most of the observers appear to have been masters of elementary schools and others not skilled in field work. It is more than likely that many stations would show a delay in arrival not actually present. In Vol. XII, 1905, p. 226, there is, however, a table showing the combined dates of arrival of 16 species from 1894 to 1903. The average yearly error, as compared with a ten year mean date of arrival, has been computed, and shows as very constant birds the following species: *Turtur turtur* and *Oriolus oriolus* with an error of 1.5 days and *Coturnix coturnix* with an error of only 1.4 days.

I have computed the average error of these same species for a later period, 1904 to 1910, using the 'Aquila' tables and find it to be 2.2 days for *Turtur*, and 2 days each for *Oriolus* and *Coturnix*.

Vol. XVIII, 1911, of 'Aquila' gives on p. 138 a large table show-

¹ Yearbook of Dept. of Agriculture, 1903, p. 383.

² Proc. 4, International Ornith. Congress, p. 163.

ing 15 years of work summed up, with actual numbers of individuals included in five day intervals. A rough idea of dates of greatest abundance is thus obtained. These 15 year bulk arrivals are compared directly with the results of the previous year 1910. On the whole this table shows a pretty orderly invasion and departure for each species, although of course the country covered is a large one with much mountainous territory, naturally tending to lengthen out the passage of migrants a great deal above what it would be if a small area had been used for tabular work.

Another way of getting some light on the orderliness of the species in migration is by comparing in a long series of years actual first arrivals with average first arrivals. In Cooke's various papers in 'Bird Lore' on the migration of N. A. Sparrows there is a large number of such records. We will take only a few of the most striking cases where observations extend over a long period, so as to get the greatest possible chance for departures from the normal.

Rose-breasted Grosbeak at Wasington, D. C., 18 years; earliest, May 1; average May 5. For the same species observed at Englewood, N. J., 12 years; earliest, May 1; average May 6. Ballston Spa, N. Y., 14 years; earliest, May 4; average May 10. St. Johnsbury, Vt., 12 years; earliest, May 6; average May 10. Chicago, Ill., 21 years; earliest, April 25; average May 3. Watterloo, Ind., 11 years; earliest, April 28, average May 2. Aweme, Manitoba, 16 years; earliest, May 12, average, May 16.

For the White-crowned Sparrow at Ottawa, Ontario, 24 years; earliest, April 30; average, May 7. For the White-throated Sparrow at Ottawa, Ontario, 27 years; earliest, April 15; average, April 26.

For the Blue Grosbeak at Raleigh, N. C., 21 years; earliest, April 25; average May 2. St. Onaga, Kan., 15 years; earliest, May 1; average May 5.

Indigo Bunting at Raleigh, N. C., 23 years; earliest, April 23; average, May 1. Renovo, Pa., 16 years; earliest, May 2, average May 9.

In thus considering a biologic problem such as migration, it is as well to remark here that we are laying ourselves open to the just criticism which biometricians incur when they rely solely on figures. This we realize fully. Perhaps data from individual birds, which

will one day be forthcoming, will show us that we have greatly exaggerated the individual potential accuracy, but on the other hand may it not be possible that in some cases we have underestimated the case, for as suggested above the first arrivals of a species flight may prove to be always the same birds, bound for a definite latitude and locality.

From Cooke¹ we get the impression that birds cannot in any way predict weather conditions, as has so often been claimed for them, and that such birds as the ducks and geese are much more liable to take advantage of weather conditions, open water, etc., than are the passerine birds. And were this accuracy of the passerines correlated in any way with an increased intelligence, we would certainly expect to see it manifested in birds like the Canada Goose and the ducks, whose superior mental endowment none can doubt. But here we seem to see it least, for in the migration of these independent fowl there is often an error of weeks as contrasted with days among their more trustful and less intelligent brethren. Has not this very intelligence tended in some subtle way to deliver the geese from the bondage, so to speak, of a hide-bound time sense, and allowed them a greater scope to grapple with seasonal conditions? This has nothing to do with the evolution of the species considered: it simply means specialization in a given direction. So also it seems to the writer that the 'potential accuracy' of birds like our Bluebird is probably much greater than we think, but the species is subjected to such a grave variation in season on account of its early arrival in the north, that it, so to speak, does merely the best it can.

Another question occurs at this point, which is really not within our enquiry, but may be mentioned, and that is the reason for the widely different migration times of different species.

Loomis² saw in this phenomenon an indication of an orderly depopulation of the North in order to prevent over-population, and he attributed all that we see now to an equalization of distribution through diversity in the time of southern migration, evolved by the progress of ages and perpetuated by the require-

¹ W. W. Cooke, Yearbook of the Dept. of Agriculture, 1910.

² Auk, 1894, p. 94, Loomis, L. M.

ments of winter. In other words, a huge and far-extending altruism, with nothing left to chance or to orthogenetic tendencies. This view is, I think, farfetched, for one cannot see how the earliest spring movements are the necessary outcome of a rush to occupy all available territory. We should suppose that many more birds could migrate at the same time without disturbing the geographical economy of seasonal dispersal.

Loomis saw in the case of the Canada Goose a continuous migration, not subject to a sudden arousing of the migratory impulse. The impelling force came in this case, he thought, more from without. But here it seems he is only partly right, for this species is certainly subject to great and sudden migratory impulses, only, as we have mentioned above, there is added an element of choice, or an ability to profit by external conditions which is not often easy to see in other birds.

Loomis's various papers in 'The Auk,' in so far as they refer to the erratic movements of birds, and peculiar periodic dispersals, are very interesting, but cannot be considered here. See also an instructive paper by Whitaker on the great invasion of southern Europe by Crossbills in 1909.¹ Even such cases of sporadic invasion of new territory may show an orderly progress and just as orderly retirement.

Many theories of course have been put forward to account for the start of vernal migrants from winter quarters. An ingenious one is that of Taverner², who saw in the breeding of tropical species an actual stimulus to wintering migrants. This stimulus was, he thought, brought about by pressure of numbers and lack of food owing to increase in resident numbers by their early breeding, the pressure extending outwards (northwards) to the limits of populated ground. Other writers have seen in the failure of the food supply in the South after the advent of the dry season, a sufficient inciting cause, but it is hardly probable that any of these reasons could account entirely for the orderly procession of different species, and their appearance at allotted times.

It remains to search for other examples of a physico-chemical

¹ Whitaker, J. I. S., *Auk*, 1910, p. 332.

² *Auk*, 1904, p. 322.

periodicity to compare our time sense with. There occurs to one immediately the phenomenon of ovulation and menstruation in man, and the appearance of rut in other mammals. But such appearances are notoriously liable to time error, and easily affected by changed conditions, disease, season, etc. Variation in periods of gestation and incubation are, it is true, extremely close to the mean for the species, but these periods are coupled and timed by very marked changes in circulation and metabolism, and are scarcely comparable with the migrating period of the bird, which has nothing but the very doubtful stimulus of the developing sex glands to check and control the migration once it has started, and even this is sometimes not present at all. I use the word 'nothing' as meaning nothing that we know of at present. It would indeed be interesting if we could subject castrated birds to experimental conditions in order to test the strength of their migratory impulses, but this could hardly be accomplished. All we know is that young birds belonging to migratory species, though they do not themselves breed during their first year, come north with the others, perhaps by imitation.

We acknowledge the dominating power of sexual 'hormones' in instituting spring migration in birds, for the instinct of reproduction is the dominant instinct in animals, and all others may be classed as secondary to it. What we cannot account for is the controlling and regulating power which must be constantly at work once the journey is begun, in order that a certain latitude may be reached at a certain time.

For instance among warblers Cooke tells us¹ that the Black and White Warbler, an early migrant, occupies a whole month in going from North Carolina to Massachusetts, averaging only 13 miles per day, while the Blackpoll Warblers that nest in Alaska make the last part of their journey, 2500 miles, in not over two weeks, or about 200 miles a day. Some Yellow Warblers accomplish the last part of their journey to Great Slave Lake more than twice as fast as the average advance of spring over the same region. From New Orleans to Great Slave Lake they are continually meeting colder weather. Even the same species shows very different rates of advance in different parts of the country.

¹ Chapman's 'The Warblers of North America.' 1907.

We have, it must be said, various other periodic reflexes, dependent on feeding habits, the diurnal movements of lower organisms following the light, and the tidal movements of various littoral creatures, with very likely a host of others. But none of these so far as I am aware exactly fits our case in birds. In fish, it is true, especially in the salmon family, we see an accurate periodic movement, often begun months before the spawning time, and therefore hardly carried out alone by a direct stimulus from developing eggs or milt. Ocean fish, like the herring of Europe, show characteristic spawning times and spawning places for each closely related race. Bats and fur-seals among mammals are other examples but as to the accuracy of arrival of these animals I am not informed.

I think it is plain, then, that the migratory impulse in birds is not to be explained on the basis of a purely physico-chemical response to an internal secretion, at least not that phase of it which pertains to potential accuracy. This may be a part but not the whole story. Nor does one wish to drag in by the heels any question of intelligent effort, for this would not help us in the least, and would tend to diminish rather than increase the time sense. I say *diminish* because instinct appears so much more mechanical, regular and blind than intelligence ever does.

If one accepts Darwinism in so far as it applies to the selective value of useful variations, it seems hard to see how this chronometer-like accuracy can have been evolved; or even assuming it to have arisen through an adaptive necessity, it is still harder to see why it should remain in its present perfection, for the most enthusiastic Darwinian could scarcely picture it as a matter of great moment to the species if it arrived one week early or one week late, with the whole season before it. We must grant of course one great source of error in our conception of potential accuracy, for as stated above, we are forced to deal with groups instead of individuals; still with a long series of years it seems as if one might gain a pretty correct impression of the accuracy of the individual bird itself.

The writer is familiar only in a general way with the subject at hand, and has merely attempted to call attention to an aspect of migration which does not seem to have been much discussed. Whether it is even worth discussing in the light of our scant knowl-

edge of instinctive actions and their causes is doubtful. With the masses of facts being brought constantly to light relative to bird travels, we are perhaps a little apt to lose sight of some of the old time mystery of the subject. The modern tendency seems to be to sniff at the word 'mystery' as applied to any phenomenon of bird migration. This is merely a question of where the word is applied; if to the actual facts, then it is hardly warranted, but if to the causes, then it is certainly as applicable now as ever. Supposing the facts all at hand, what would the student know about the actual inherent impetus, the heritability of instinct, or the powers of orientation and their mechanism? Would he be one whit better off than the present day systematist who with all his finely cut races does not really know how or why a new species arises?

Mystery there certainly is, and mystery there will always be as long as *the* great biologic problems remain unsolved. The formation and maintenance of this time sense is only one of those activities of nature which tend to make the sternest advocate of mechanism doubtful of its all-sufficiency. It is so much easier to find behind that clock-like movement a vital impetus, 'a guiding unity.'

"It (the evolution of life) is a creation that goes on for ever in virtue of an initial movement. This movement constitutes the unity of the organized world — a prolific unity, of an infinite richness, superior to any that the intellect could dream of, for the intellect is only one of its aspects or products." (Bergson.)

THE RELATION OF BIRD MIGRATION TO THE
WEATHER.

BY WELLS W. COOKE.

THE belief is quite general that there is a close connection between the weather and bird migration; that if the weather is not the cause of migration, it is at least the most important, indeed the governing, factor in determining the time of the bird's arrival, and particularly in causing the variations from year to year. The intimate relation supposed to exist between the weather and the bird's movements is thus promulgated by a very acute migration observer who wrote me: "I have collected such a large number of dates for our common birds that if you give me a good account of the weather conditions, I can give you the dates of arrival and movements of many species without going into the field." After an exhaustive study and comparison of bird arrivals with the accompanying weather, the results were found to be so utterly at variance with the above quoted opinion, that they were summarized as follows: "The weather encountered en route influences migration in a subordinate way, retarding or accelerating the birds' advance by only a few days and having slight relation to the date of arrival at the nesting site. Local weather conditions on the day of arrival at any given locality are minor factors in determining the appearance of a species at that place and time. The major factors in the problem are the weather conditions far to the southward, where the night's flight began, and the relation which that place and time bear to the average position of the bird under normal weather conditions."

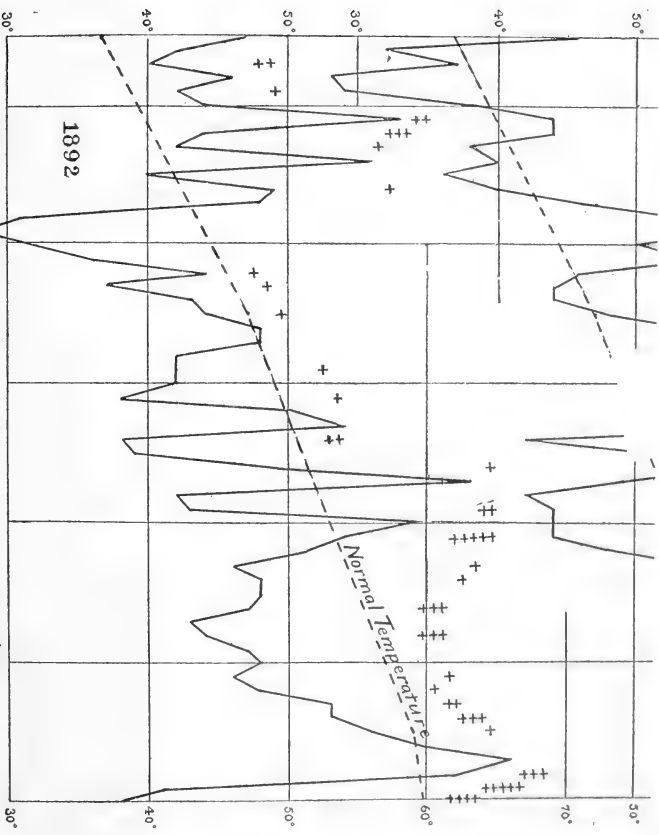
The above quotation is from an article that was written for the yearbook of the Department of Agriculture for 1910. In its necessarily condensed form, there was opportunity for nothing more than a mere statement of conclusions, without any of the data on which those conclusions were based. It seems advisable that a synopsis of the more important of these data should be published as a contribution to knowledge of the phenomena of bird migration.

For the solution of the proposed problem it is necessary to have the notes of a thoroughly reliable and competent observer, who is

constantly in the field so as to note the birds immediately on their arrival; it is also necessary that these observations be continued long enough to make possible the computation of reliable averages. A great advantage would be to have these records taken in a district free from mountains, valleys, or any other physical features that would tend to interfere with the free and uninterrupted northward movement of migration. The fulfilment of all these conditions was found in the work of Dr. J. C. Hvoslef at Lanesboro, Minnesota. An ardent student of bird life, a close observer with a good knowledge of birds, his profession as a physician with a large country practice, kept him daily in the field and made it probable, that few birds would escape his acute observation. Dr. Hvoslef contributed migration records for ten consecutive years, 1884-1893. At the same time notes were received from several towns in Iowa — notably Grinnell, Iowa City and Coralville — whose records are especially valuable as supplementary and corroborative evidence.

As is well known the weather comes usually in alternate cold and warm waves. If therefore the weather is the controlling factor in bird migration, then the progress of migration should be in waves corresponding to those of the weather, birds arriving freely when the temperature rises above normal and checking their advance when it falls below. While a sort of general correlation can be noted between the waves of weather and migration, the exceptions are many and striking. The accompanying chart gives the course of the weather and migration for three years at Lanesboro, Minnesota. The first year, 1885, shows two pronounced waves of bird arrival coinciding with two waves of decided warm weather; it also shows the biggest migration wave of the whole season coming at the coldest part of a sharp cold snap that sent the temperature far below normal. The second year, 1889, shows a close agreement between the larger waves of migration and the warmer waves of temperature. The third year, 1892, shows all the large bird movements as occurring not on account of the weather but in spite of it.

The bird wave of May 7, 1885, is particularly to be noted. On this day a storm of snow with a north wind forced the temperature below the freezing point, yet on the morning of May 7 "the woods and river bottoms seemed to be almost alive with small birds." Among these were the following seen for the first time:



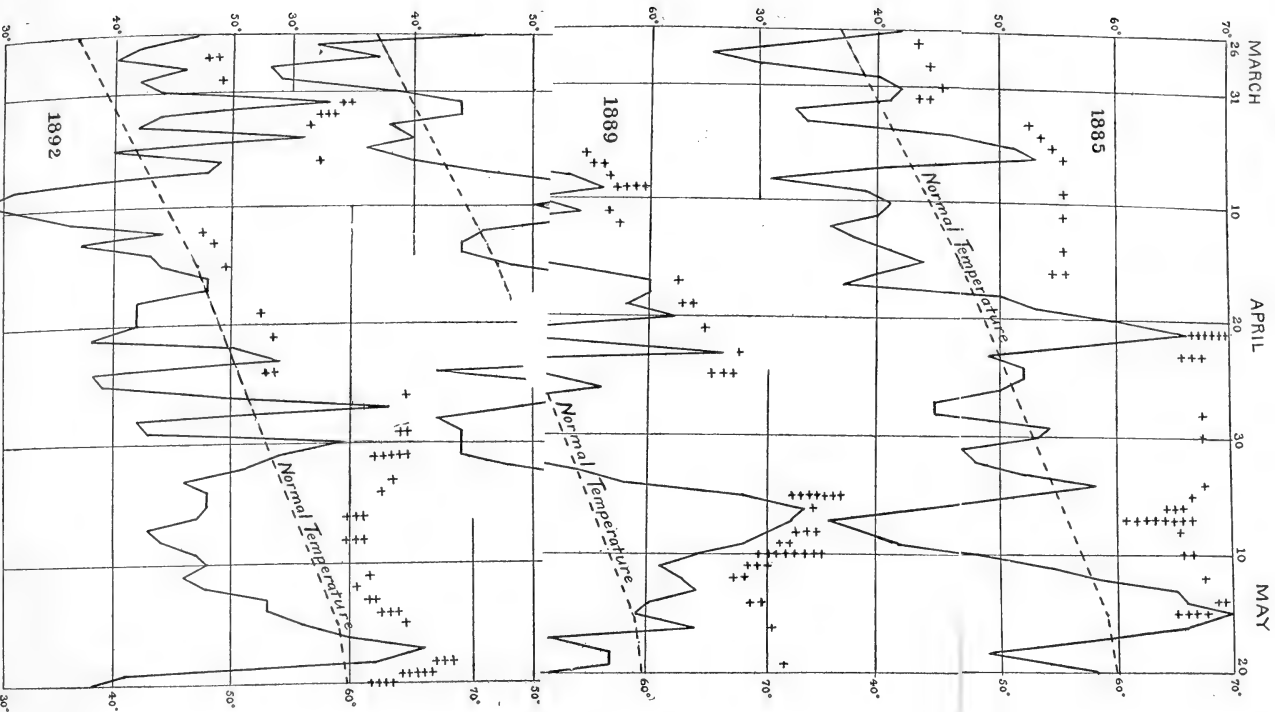
Spring Migration at Lanesboro, Minn.

1892

Normal Temperature

The heavy lines show fluctuations in temperature. The crosses show bird arrivals. Each cross represents the arrival of a species not previously noted that year.





Spring Migration at Lanesboro, Minn.
 The heavy lines show fluctuations in temperature. The crosses show bird arrivals.

Each cross represents the arrival of a species not previously noted that year.

Catbird	average date of arrival	May 6
Water-Thrush	" " " " "	6
Black-throated Green Warbler	" " " " "	7
Wilson's Warbler	" " " " "	8
Veery	" " " " "	8
Solitary Vireo	" " " " "	8
Nashville Warbler	" " " " "	9
Scarlet Tanager	" " " " "	10
Rose-breasted Grosbeak	" " " " "	10
Tennessee Warbler	" " " " "	11

A queer state of affairs is witnessed in the spring of 1892 when the temperature for a large part of the migration season was decidedly below the average. The birds arrived late but even then did not wait until the temperature had arisen to their normal.

Species.	Arrived later than the average.	Arrived at a temperature lower than the average.
	days.	degrees F.
Black and White Warbler	2	8
Lincoln's Sparrow	0	9
Ovenbird	2	13
Water-Thrush	0	9
Kingbird	5	10
Warbling Vireo	13	
Chestnut-sided Warbler	12	
Maryland Yellow-throat	7	6
Catbird	1	13
Yellow Warbler	10	
Wilson's Warbler	11	
Veery	6	4
Olive-backed Thrush	0	13
Red-eyed Vireo	9	
Indigo Bunting	13	
Scarlet Tanager	8	
Magnolia Warbler	11	
Tennessee Warbler	9	
Redstart	7	
Nighthawk	10	
Gray-cheeked Thrush	2	

As proof that birds are not dependent on any exact temperature for their time of migration, it can be stated that birds do not move north in the spring as soon as the temperature rises to the degree of warmth at which they ordinarily migrate. Thus the Baltimore Oriole arrives at Lanesboro, Minn., at an average temperature of about 55° F. but it does not make its appearance as soon as the temperature has risen to this point. The Oriole was not noted at Lanesboro before May 1 in any of the years from 1884 to 1893, though in 1884 a temperature of 55° F. was attained on April 25, in 1885 on April 20, and in the following years on April 9, April 8, April 26, April 9, April 11, April 13, April 1, and April 3. During the spring of 1886, the temperature from April 13 to April 23 averaged 65° F. but no Orioles appeared.

On the other hand, birds do not always wait for their average temperature before they migrate. In 1893 there had been no three consecutive days during the whole spring with as high a temperature as 55° F. when the Baltimore Oriole arrived at Lanesboro, and during the previous two weeks no temperature higher than 48° F. either at Lanesboro or in the country a hundred and fifty miles to the southward.

It thus appears that each species has a wide range of temperature at which it can migrate. In the case of early migrants this varies from 40° F. down to many degrees below freezing, while with the latest from about 40° F. to 70° F.

If the movements of migration are caused by the weather, then it should be that a late spring would retard the arrival, and that the birds would appear earlier in an unusually warm season. The facts do not seem to bear out this supposition. During the nine years, 1885-1893, at Lanesboro, the larger variation in the time of arrival occurred under the following conditions. In this table a 'warm' temperature is three or more degrees above the normal and a 'cold' an equal amount below; the intervening temperatures are called 'normal.'

Bird arrivals at Lanesboro, Minn. 1885-1893.

	No. of Instances.
The birds came three or more days	
early with a warm temperature.....	58
late " " cold "	60
on time with normal temperature.....	7
Arrivals agree with theory.....	125

The birds came three or more days					
early	with a cold	temperature	.....	42	
late	" " warm	"	.....	41	
early	" " normal	"	.....	29	
late	" " "	"	.....	23	
Arrivals do not agree with theory.....					135

The above figures show that in the case of the more pronounced variations, the arrival seems to have been hastened by warm weather or delayed by cold in only 125 instances out of 260, or only 48 percent.

The smaller variations show still less dependence of movement on warmth.

Bird arrivals at Lanesboro, Minn., 1885-1893.

					No. of
					Instances.
The birds came one or two days					
early	with a warm	temperature	.....	47	
late	with a cold	temperature	.....	38	
Arrivals agree with theory.....					85
The birds came one or two days					
early	with a cold	temperature	.....	28	
late	with a warm	temperature	.....	43	
early	with normal	temperature	.....	18	
late	with normal	temperature	.....	23	
The birds came on time with a cold temperature.....					
"	"	" " " " " " " warm	temperature	.....	21
Arrivals do not agree with theory.....					148

Here is no evidence at all that the temperature has either stimulated or retarded bird migration.

A slight connection may be noted by comparing the total number of arrivals in warm and in cold weather. During the spring days of these nine years, when the temperature was above the normal, 243 arrivals of birds were noted, and when the temperature dropped below the normal, only 182 birds were recorded as arriving. This shows that whether or not the warm weather causes them to come earlier, they prefer on the average to advance when the weather is warmer than normal.

Birds prefer to migrate in spring during a rising temperature. This preference is strongly marked as will be seen by the following table based on the records of 1885-1893 at Lanesboro, Minnesota.

Year.	Number of instances that the mean temperature of the day of arrival was —		
	Three or more degrees warmer than that of the previous day.	Within two degrees or less of that of the previous day.	Three or more degrees colder than that of the previous day.
1885	20	10	18
1886	19	32	8
1887	37	6	11
1888	31	17	13
1889	28	13	17
1890	17	28	12
1891	41	14	5
1892	16	21	21
1893	25	19	10
Total	234	160	115

It will be noticed that the instances of arriving during or just after a rising temperature are just about twice as numerous as the opposite. Moreover it is to be remembered that out of these latter, there are 36 that occur on a pronounced cold day following just after a pronounced warm day, and it may easily be that many of these actually arrived on the warm wave of the day previous and were not detected until the following day.

The temperature of the day of arrival is on the average higher than the average temperature of the two days before the bird is noted. This is another way of saying that on the average birds move north when a rise of temperature occurs.

Species.	Average temperature of the day of arrival.	Average temperature of the two days previous to arrival.
	degrees F.	degrees F.
Lanesboro, Minnesota		
Robin	41	35
Fox Sparrow	46	42
Towhee	56	52
Brown Thrasher	57	56
Rose-breasted Grosbeak	59	56
Baltimore Oriole	58	55
Wilson Warbler	56	55
Magnolia Warbler	58	56
Scarlet Tanager	58	56
Grinnell, Iowa.		
Robin	35	28
Fox Sparrow	46	42
Towhee	49	43
Brown Thrasher	57	52
Rose-breasted Grosbeak	57	52
Ovenbird	55	51
Baltimore Oriole	55	53
Scarlet Tanager	56	55
Average	53	50

Let us next consider the very wide range of temperature under which birds migrate. The temperature at the time of the bird's arrival is easily ascertained, since it is probable that most night migrants begin their flight soon after nightfall, and accomplish the larger part of their journey before midnight, so that the temperature at ten o'clock in the evening would be close to the average temperature for that night's migration. This ten o'clock temperature can be calculated for any part of the Mississippi Valley from the permanent records of the United States Weather Bureau, and in the prosecution of this research, unlimited access was given by the Bureau to their original data.

To ascertain whether any relation exists between the arrival of the birds and temperature, eight common birds were selected, species so common, well known, and conspicuous, that they would

probably be seen immediately on arrival; these eight birds were also selected from early, medium, and late migrants, so as to have the test made during all parts of the migration period.

Species.	Average date of arrival.	10 P. M. temperature of the day before the bird was first seen.			
		Average.	Ex-tremes.	Extreme variat'ns.	Average variation.
		deg. F.	deg. F.	deg. F.	deg. F.
Lanesboro, Minnesota, 1885-1890.					
Robin	March 16	40	28-47	19	4
Fox Sparrow	April 4	44	33-58	25	7
Towhee	April 16	54	41-67	26	8
Brown Thrasher	April 24	57	38-69	31	10
Rose-breasted Grosbeak	May 4	59	36-67	31	8
Ovenbird	May 4	56	35-72	37	11
Baltimore Oriole	May 4	54	46-66	20	6
Scarlet Tanager	May 10	54	36-69	33	11
Average				28	8
Grinnell, Iowa, 1885-1890.					
Robin	March 6	32	24-41	17	5
Fox Sparrow	March 26	46	33-51	18	8
Towhee	March 21	46	34-51	17	5
Brown Thrasher	April 15	55	44-71	27	7
Rose-breasted Grosbeak	April 29	60	48-74	26	8
Ovenbird	April 29	55	48-67	19	5
Baltimore Oriole	April 29	56	49-71	22	5
Scarlet Tanager	May 2	60	52-71	19	7
Average				21	6
Average of both localities				24	7

The average variation in the time of arrival of these eight species is 3.8 days and the average variation in the temperature is 7° F. During the months of March, April, and May, the temperature in the Mississippi Valley rises about one degree for each two days, so that a variation of 7° F. would be equivalent to about fourteen days

variation in the time of migration. Thus the temperature under which the birds are migrating is about four times as variable as the day of arrival of the birds.

The above table representing the temperature at 10 P. M. of the night during which the birds arrived is probably the nearest approximation that can be obtained to the actual temperature at the time the birds arrived. Since the birds have undoubtedly flown many miles during the night, it might be that the temperature of the place where the evening flight started would have a controlling influence.

Species.	Average date of arrival at Lanesboro.	10 P. M. temperature, 150 miles south of Lanesboro, on the evening before the bird was first seen at Lanesboro.			
		Average.	Ex-tremes.	Extreme variat'ns.	Average variation.
		deg. F.	deg. F.	deg. F.	deg. F.
Robin	March 16	45	34-57	23	7
Fox Sparrow	April 4	49	40-57	17	6
Towhee	April 16	58	47-73	26	9
Brown Thrasher	April 24	59	39-66	27	7
Rose-breasted Grosbeak	May 4	61	40-70	30	7
Ovenbird	May 4	58	40-71	31	10
Baltimore Oriole	May 4	57	49-64	15	4
Scarlet Tanager	May 10	58	40-76	36	7
Average				26	7

The average of these last two tables is probably the best statement obtainable of the actual temperature at which the birds migrated.

It is difficult to see how the mean temperature of the day when the bird was first noted could have had any great influence on its migratory movements of the previous night, but as these conditions under which we first see the bird are the ones we are most likely to associate with the bird's arrival, they have also been calculated.

Species.	Average date of arrival.	Mean temperature of the day the bird was first seen.			
		Average.	Ex- tremes.	Extreme variation.	Average variation.
Lanesboro, Minnesota, 1885-1890.		deg. F.	deg. F.	deg. F.	deg. F.
Robin	March 16	41	31-52	21	7
Fox Sparrow	April 4	46	38-52	14	4
Towhee	April 16	56	38-66	18	8
Brown Thrasher	April 24	57	45-67	22	8
Rose-breasted Grosbeak	May 4	59	36-73	37	10
Ovenbird	May 4	55	36-73	37	10
Baltimore Oriole	May 4	58	44-73	29	9
Scarlet Tanager	May 10	58	36-69	33	9
Grinnell, Iowa. 1885-1890.				25	8
Robin	March 6	35	12-24	32	4
Fox Sparrow	March 26	46	38-56	18	6
Towhee	March 21	49	38-58	20	6
Brown Thrasher	April 15	57	45-67	22	6
Rose-breasted Grosbeak	April 29	57	49-71	22	6
Ovenbird	April 29	55	47-62	15	4
Baltimore Oriole	April 29	55	49-70	21	6
Scarlet Tanager	May 2	56	47-71	24	8
Average				22	6
Average of both localities				24	7

Other temperatures were also compared as follows:

Temperature.	Extreme variation.	Average variation.
	deg. F.	deg. F.
Mean temperature of the day before the bird was first seen	19	5
Average mean temperature of the two days before the bird was seen	15	5
Average mean temperature of the second and third days before the bird was seen	16	5
Mean temperature, 150 miles south of the place of observation, of the day before the bird was seen	21	6

The above temperatures probably include all that would influence the bird in the flight which brought it to the place of observation. A careful examination of these tables will convince anyone that these temperatures with their great variations could not have been the cause of the migration. A bird that arrives with an average temperature of 50° F. may appear one year when the temperature is below 40° and is just as likely to be seen for the first time the next year with a temperature far above 60°. Even omitting the extreme variations, yet the average variations are far more variable than the movements of the birds and demonstrate that temperature alone does not cause the birds to move northward.

Conversely these figures show that no one of these birds is restricted to any single temperature for the performing of its migration, but that each one can and does migrate with a wide range of temperature.

It is interesting to note in passing, the wide differences between the average temperature of the day of arrival, and the average of the temperatures of the days of arrival. Thus the average date of arrival of the Robin for the years 1885-1890 was at Lanesboro, Minn., March 16, and the average temperature of March 16 at Lanesboro is 31° F. But the average of the temperatures of the days during 1885-1890 on which the Robin was first seen at Lanesboro was 41° F. This indicates that the Robin had varied its arrival both before and after March 16 so as to arrive on those days that were warmer than the average. An extreme difference of 10° was found in the case of the Robin which is an early migrant and often encounters severe storms. With birds like the Brown Thrasher which move about the middle of the season these differences are only about half as great, while in the case of late migrants like the Baltimore Oriole and the Scarlet Tanager these differences disappear, since in the latter part of the season few storms are severe enough to interfere seriously with migration.

In addition to all the local temperatures at the time of arrival, it is possible that the total heat for the previous month or the total heat of the whole spring might be a determining factor. All of these different temperatures were examined and to show how they work out in detail, all these temperatures are given for a single species; the bird selected is the Baltimore Oriole because that

Relation between the Weather and the Arrival of the Baltimore Oriole at Lanesboro, Minnesota.

Year	1881	1885	1886	1887	1888	1889	1890	1891	1892	1893	May 4	Average Percent of Variation
Date of arrival	May 6	May 6	May 5	May 1	May 6	May 5	May 2	May 3	May 3	May 6	May 4	
Total degrees of heat from January 1 to day of arrival	3507	3132	3833	3332	2540	3801	3576	3716	3594	3037	3427	31
Total degrees of heat from March 1 to day of arrival	2644	2548	2814	2513	2283	3060	2377	2405	2432	2459	2562	30
Total heat at Dubuque from March to day before arrival at Lanesboro	2707	2598	2721	2522	2528	2944	2417	2507	2457	2564	2597	20
Total heat at Davenport from March 1 to day before arrival at Lanesboro	2901	2805	2815	2614	2686	3014	2570	2565	2588	2691	2615	15
Average temperature of April at Lanesboro	46	46	52	48	44	49	50	49	44	43	47	19
Average temperature of April at Dubuque	48	47	51	51	48	50	51	51	46	45	49	12
Average temperature of April at Davenport	50	49	52	52	50	51	53	52	47	47	50	12
Mean temperature at Lanesboro of the day the species was first noted	57	53	59	73	50	68	54	50	46	50	56	48
Mean temperature at Lanesboro of the day before arrival	58	51	57	67	51	53	48	51	51	48	54	35
10 p. m. temperature at Lanesboro of the day before arrival		46	56	65	52	66	54				56	36
Mean temperature at Dubuque of the day before the bird is noted at Lanesboro	61	55	59	66	54	59	50	51	58	44	56	40
Mean temperature at Davenport of the day before the bird is noted at Lanesboro	63	56	60	65	56	60	50	50	62	44	57	37
10 p. m. temperature at Davenport of the day before the bird is noted at Lanesboro	49	56	64	64	59	67	59				59	31

has the smallest variation in its time of arrival of all the birds that were recorded at Lanesboro.

In the matter of the total amount of heat received in the spring the variations are 30 percent whether estimated from the first of January or from the first of March, moreover the largest variations from 2283° in 1888 to 3060° in 1889 occur with but a single day difference in date of arrival. The same result is obtained if the date of appearance is compared with the total heat received in the vicinity of Dubuque, eighty miles south of Lanesboro, or at Davenport, a hundred and fifty miles farther south, though the percentage variations are not so great, that at Davenport being only 15 percent.

Parenthetically it may be remarked that the temperatures during the winter and previous to March 1 have seemingly no effect on plant or animal growth and it is the degrees of heat after March 1 that determine the advance of the season. This was strikingly shown at Washington, D. C., the spring of 1912, when after a winter of unusual severity in January and February, the growth of plants became fully up to normal as soon as the heat after March 1 had risen to its normal and long before the total heat counted from January 1 had reached the average. The bird arrivals averaged earlier than usual notwithstanding the cold winter.

The variations in the time of the arrival of the bird from year to year do not agree with the variation of the season. The spring of 1889 is the warmest, March and April together, at all three places; indeed that spring is one of the warmest the Mississippi Valley has ever known, but the Oriole does not arrive so early this year as the average of the ten years. But little relation can be traced between the changes in temperatures and the changes from year to year in the time of arrival. It is true that in 1893, when the Oriole arrived at its latest date — May 6 — the temperature is the coldest at all three places, and in 1887 when the date of arrival is the earliest — May 1 — the temperature is also the highest at all three places. But here the agreement ends, for the Oriole also arrives on May 6 in the years 1884, 1885, and 1888, that are both cold and warm years and on May 2 in 1890 that is among the colder years.

During spring migration the direction of the wind seems to have

little if any effect on the arrival of the birds. There were 253 days when arrivals were noted at Lanesboro, Minn., 1885-1893, and the wind the night before had been from the following directions: west, 29 times, northwest 45, north 29, northeast 22, east 18, southeast 27, south 51, southwest 24, calm 8 times. Combining the directions, the sum of the northwest, north, and northeast winds is 96 times and the sum of the southeast, south, and southwest, 102 times. Thus the birds migrated with the wind blowing against them just about as frequently as with a favorable wind. It is especially to be noted that the percentage of each of the winds in the above table is very close to the average percentage of the time in the spring that the wind is in that direction. Thus the birds arrived with a south wind, 51 times or 20 percent of the times observed. During the 828 days of March, April, and May, 1885-1893, the wind was south 161 days or the same 20 percent. The birds arrived with a northwest wind 18 percent of the times and the wind blew from the northwest 19 percent of the time.

Direction of the wind.	Percent of days the wind blew from this direction.	Percent of times the birds arrived with a wind from this direction.
West	13	11
Northwest	19	18
North	13	11
Northeast	9	9
East	5	7
Southeast	10	11
South	20	20
Southwest	8	10
Calm	3	3

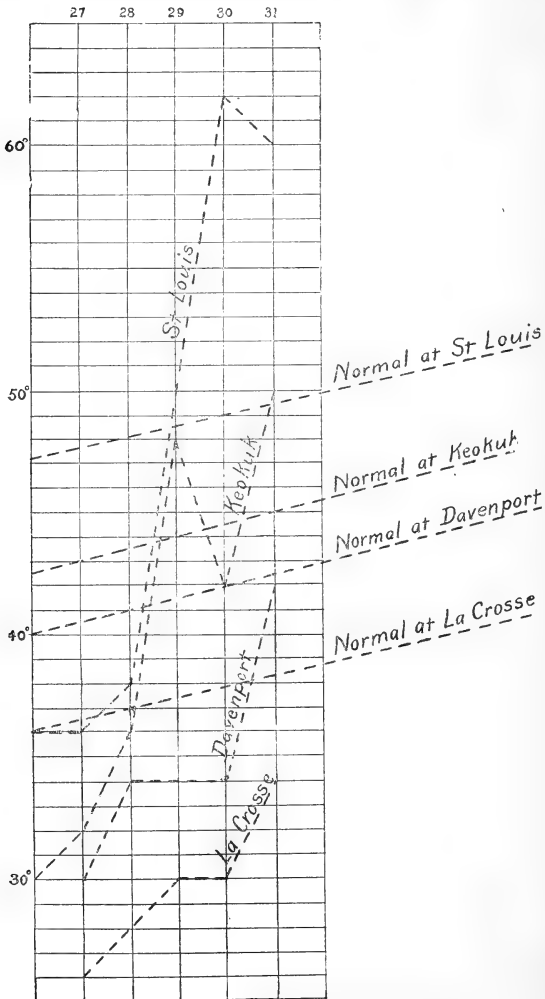
These figures show that when birds are moving north in the spring they pay little attention to the direction of the wind. The same conclusion was reached after an extended investigation of the date of migration as observed at the lighthouses of southern Florida. The Biological Survey has the records for many years of each night in spring on which birds were noted passing the lights. These birds are fresh arrivals in Florida after a flight over the ocean

from Cuba. One would expect these birds, if any, to wait for a favoring wind before starting to sea, but the records indicate that they pay no attention to the direction of the wind. If the birds preferred a south wind, there should be a large number of arrivals during south wind periods, or if they disliked a head wind, there should be only a few north wind records. As a fact neither of these conditions is found and the percentage of migration with a south wind is no greater than the average percentage of south wind that occurs there during the spring months, and the birds fly directly against a north wind as often proportionally as north winds occur.

Spring migration consists of a series of rapid advances followed by days of inactivity or possibly of retrogression. After a check to the northward movement and a period of rest, when the next advance occurs, it does not merely proceed far enough to make up for the lost time, but the birds are quite apt to make a long flight forward until they are in advance of their normal position.

A striking example occurs in the migration notes from Lanesboro, Minnesota. During the spring of 1888, the temperature dropped on March 22, thirty-four degrees below the normal and migration was suspended for about two weeks. The temperature rose gradually and when the warmth was almost to normal on April 1, a great arrival of birds occurred. The Phoebe, Bronzed Grackle and Killdeer appeared after a delay of five, four, and three days respectively; the Song Sparrow was present just on time, while the Fox Sparrow was three days in advance of his usual date, the Brown Creeper four days, the Ruby-crowned Kinglet, Yellow-bellied Sapsucker, Field Sparrow and Purple Martin, seven, nine, nine, and ten days earlier than usual. This early arrival is the more strange in this particular case, because the temperature, while it rose decidedly, did not quite reach normal, so that these last six species flew far north at an early day and during cold weather.

It seems probable that in such cases some abnormally warm weather to the south of the place of arrival is the real cause of the phenomenon, but in the present instance one must look far south for the warm wave. The course of the weather during the three days previous is shown in the accompanying chart. Lanesboro



TEMPERATURE AT 10 P. M., MARCH 27-31, 1888.

is so near LaCrosse that the temperatures of the two places were probably not much different. The evening of March 28, the temperature is lower than normal throughout the Mississippi Valley. During the next day the temperature at both Keokuk and St. Louis rises above the normal bringing on a large migration at St. Louis with clear weather and a south wind all the way from St. Louis to the Gulf.

The night of March 31 is clear over all the Mississippi Valley from St. Paul to the Gulf, with a light south wind from the Gulf to Cairo, and a light east and northeast wind the rest of the way to LaCrosse. The temperature at St. Louis is far above normal, Keokuk, a little above, Davenport slightly below and LaCrosse about five degrees below normal. Conditions for migration were therefore very favorable from the south to about Keokuk and thence northward not unfavorable. Hence it may be considered that these six species — the Fox Sparrow, Brown Creeper, Ruby-crowned Kinglet, Yellow-bellied Sapsucker, Field Sparrow and Purple Martin — had arrived by the night of March 29 in southern Iowa (judging from the weather and from the notes contributed by the observers in Iowa) and during the evening of March 31 they started north again. The individuals that were noted at Lanesboro the morning of April 1 had therefore traveled the night before from at least as far south as Davenport and probably from Keokuk.

TWO NEW RACES OF THE PIGMY OWL FROM THE
PACIFIC COAST.

BY J. GRINNELL.

(Contribution from the Museum of Vertebrate Zoölogy of the
University of California.)

STUDENTS of Californian birds have long been aware of the existence within this state of two readily distinguishable races of the Pigmy Owl. One inhabits the humid coast belt south to Monterey County, the other occupies the relatively much more arid Sierra Nevada, and mountain ranges of southern California. The first-indicated subspecies has borne the name *Glaucidium gnoma californicum*; the second, having been assumed to be the same as the Rocky Mountain bird, was called, in common with the latter, *Glaucidium gnoma gnoma*.

Beyond a haunting suspicion that the Californian interior bird might prove different, upon comparison of actual specimens, from that of the Rocky Mountain region, the situation remained unchanged until, in 1910, E. W. Nelson (Proc. Biol. Soc. Wash., Vol. XXIII, p. 103) named the Rocky Mountain Pigmy Owl as distinct from the true *G. g. gnoma* at the southern end of the Mexican Tableland. The northern bird received the name *Glaucidium gnoma pinicola*. In Nelson's description of it comparison is made with not only true *gnoma* but also with *californicum*, the latter name being clearly used for the small, reddish-brown humid coast race.

These comparative remarks at once aroused a query as to the relationships of the Californian interior bird; and the writer forwarded to Mr. Nelson two southern California specimens for critical examination. These he pronounced to be *not* his *G. g. pinicola*, but probably representative of a distinct new subspecies. Since the only question in the writer's mind was in regard to the distinctness between the Californian interior race and Nelson's *pinicola* of the Rocky Mountains, the course of action seemed to be perfectly clear, that is, to formally name the southern California

bird. It would have been more proper for Mr. Nelson himself to have described the race, in view of his work in the genus; but claiming to be engrossed with work upon newly arrived Central American material, he courteously insisted upon the writer's assuming the not distasteful function of describer.

In order that comparisons in both directions might be verified, seven examples of *G. g. pinicola* from the Biological Survey collection were, through the kindness of Mr. H. W. Henshaw, forwarded to the writer as a loan. These, together with the west coast material in the California Museum of Vertebrate Zoölogy and in the private collections of F. S. Daggett, H. S. Swarth and J. Grinnell, form the basis for the following characterizations.

The assembling of this material unexpectedly pointed to the expediency of further nomenclatural action. Mr. H. S. Swarth has already pointed out (Univ. Calif. Publ. Zool., Vol. 10, 1912, pp. 31, 32) the peculiarity in coloration of four Pigmy Owls from Vancouver Island. There now seem to be sufficient grounds for recognizing an extreme northern humid coast race, the range of which is to be split off from that previously accorded to *G. g. californicum*. The latter name is thus restricted to the subspecies inhabiting the coast belt from Washington to central California.

Close study has resulted in the conclusion that there is a dependably constant tone of coloration in Pigmy Owls from any one faunal area, in other words that much of the variation which strikes one at first glance as being extraordinary, is accounted for by difference in wear and age. Only adults have the top of head uniform in shade with the dorsum, juvenals, even though full-grown and full-feathered, having the top of the head slate gray of varying shades conspicuously contrasted with the brownish of the back. The writer is unable to find any so-called "phases" of coloration in this species.

The designation of *three* forms of *Glaucidium* from the Pacific Coast district may seem a surprising innovation to some, but it is nothing more than might be expected after a review of the facts as already worked out in other genera of resident birds. The reader should recall the present systematic treatment throughout the same area, of *Bubo*, *Otus*, *Dryobates*, *Cyanocitta*, *Certhia*, and *Thryomanes*.

Glaucidium gnoma vigilante, new subspecies.

SIERRA PIGMY OWL.

TYPE.— ♀ ad., no. 379, coll. J. Grinnell; foothills at 2250 ft. alt., 4 miles north of Pasadena, Los Angeles County, California; February 18, 1894; collected by J. Grinnell.

DIAGNOSIS.— Nearest like *Glaucidium g. californicum*, but size slightly larger and coloration much paler, broccoli brown dorsally and laterally, instead of warm russet brown; light markings slightly more increased in extent. Differs from *G. g. pinicola* in smaller size, and distinctly browner coloration; white flecks on back circular in shape rather than of transverse trend.

DISTRIBUTION.— Mountain ranges of southern California, and southern Sierra Nevada, at least from Bear Valley, San Bernardino County, north to Lindsay, Tulare County (probably throughout the Sierra Nevada north to Mount Shasta).

Glaucidium gnoma swarthy, new subspecies.

VANCOUVER PIGMY OWL.

TYPE.— ♀ ad., no. 15637, Calif. Mus. Vert. Zool.; Errington, Vancouver Island, British Columbia; September 11, 1910; collected by H. S. Swarth.

DIAGNOSIS.— Nearest like *Glaucidium g. californicum*, but much darker colored throughout, inclining to bistre dorsally, and white markings much reduced in extent; feet and legs heavily suffused with sepia; streaking below nearly black; size as in *californicum*. Differs from *G. g. pinicola* in smaller size, very much darker and browner coloration, and restriction of light markings; the remnants of the latter are pervaded with deep clay color.

DISTRIBUTION.— Vancouver Island (and, probably, adjacent mainland of British Columbia and coast belt of Washington).

REMARKS.— The name selected for the subspecific appellation of this new race serves as a merited means of signaling the painstaking field and systematic research devoted to northwest coast ornithology by Mr. Harry S. Swarth during his incumbency as Curator of Birds in the California Museum of Vertebrate Zoology.

MEASUREMENTS.

G. gnoma pinicola, ♀, no. 203634, U. S. Nat. Mus., Jamez Mts., New Mexico: Wing 105 mm., tail 79, tarsus 23.

G. gnoma vigilante, ♀, type: Wing 96.4, tail 73, tarsus 20.8.

G. gnoma californicum, ♀, no. 4396, Calif. Mus. Vert. Zool., Marin County, California: Wing 93.4, tail 65, tarsus 20.7.

G. gnoma swarthy, ♀, type. Wing 92.3, tail 67.7, tarsus 20.

ONTARIO BIRD NOTES.

BY J. H. FLEMING.

SINCE my 'Birds of Toronto' was published in 'The Auk'¹ the manuscript list of Toronto birds written about 1885 by Mr. Ernest Seton has been found in the records of the Biological Survey at Washington, and though the annotations are as brief as possible, it is of considerable value. A greater part of the portion dealing with the water birds is based on information supplied by the late Wm. Loan, a professional shooter whose information is known to have been reliable. The list supplies definite records for two species that were in my hypothetical list.

Since 1906 several species have been found breeding at Toronto that were not known to do so then, and additional records of several rare birds are given in this article, together with other unpublished Ontario records.

Sula bassana. GANNET.—An immature male freshly killed was found floating in Lake Ontario outside Toronto on December 19, 1908; it was in good condition and had recently swallowed a herring seven inches long; the bird is now in my collection.

Another immature bird taken near Ottawa on October 14, 1909, has been recorded by Mr. J. M. Macoun,² and I am informed by Mr. E. G. White that a second specimen was taken at Ottawa about the same time and mounted by Mr. Henry.

Hydrochelidon nigra surinamensis. BLACK TERN.—No breeding records for Toronto till 1906 when Mr. W. R. Humphreys took a set of two eggs on May 30 in Asbridge's Marsh. This tern has since become a not uncommon breeder; a pair seen at Toronto Island on July 18, 1911, had downy young, and were not themselves in full plumage, both having a good deal of white on the head and under parts.

Pelecanus erythrorhynchos. WHITE PELICAN.—The only definite Toronto record is from Seton's manuscript list as follows: "Wm. Loan killed one in 1862, has seen at least a dozen in all."

Marila collaris. RING-NECKED DUCK.—A female taken on September 24, 1906, by Mr. O. B. Spanner at Wassy Lake, Coleman Township, Parry Sound District, is in my collection. Ring-necked Ducks are not

¹ Auk, 1906, pp. 437-453, 1907, pp. 71-89.

² Ottawa Naturalist, 1910, p. 192.

common in southern Ontario and the following records are of interest: in 1906, I examined three females (?) that were taken about October 15, and five full plumaged males that were taken about November 6, the exact locality could not be ascertained except that they were from southern Ontario and probably at no great distance from Toronto. In 1907, I examined two that had been taken probably at Toronto Island on October 12, and saw two more on the 22d, from somewhere in southern Ontario. On April 9, 1909, I saw a single pair in a large flock of mixed ducks that were sheltering in Toronto Bay from a westerly gale. The rarity of this species is interesting when compared with Mr. Loan's statement in Seton's manuscript list as follows: "Marsh Bluebill, uncommon migrant, first week of April to last of September, years ago it was our commonest duck."

Chen hyperboreus hyperboreus. SNOW GOOSE.—In Seton's manuscript list the following Toronto record is given based on Mr. Loan's information. "Very rare fall migrant, four killed in 1875, several seen since."

Olor columbianus. WHISTLING SWAN.—A flock of six were in Toronto Bay, from April 8 to 18, 1909. They were seen by a number of observers and were identified by Mr. J. H. Ames on the 18th. The birds were driven in by a heavy westerly gale.

Mycteria americana. WOOD IBIS.—One taken in November, 1892, near Simcoe, Norfolk County, by a farmer, name unknown. The record is based on a drawing of the dead bird made by a correspondent of Mr. C. W. Nash, to whom I am indebted for permission to publish this first Ontario record.

Rallus elegans. KING RAIL.—A male taken at Toronto on April 24, 1907, is in my collection.

Gallinago delicata. WILSON'S SNIPE.—A nest containing four eggs was found in Ashbridge's Marsh on May 12, 1910, by Mr. R. Buchanan; the eggs were undisturbed and later the young were photographed by Mr. J. A. Munro. This is the first definite Toronto breeding record.

Limosa fedoa. MARBLED GODWIT.—An adult female taken on the Eastern Sandbar, Toronto, on September 20, 1906, is the first Autumn record. An immature bird taken at the same place on August 13, 1909, is the first young bird recorded from Toronto.

Charadrius dominicus dominicus. GOLDEN PLOVER.—The following records show that this Plover is again increasing on Toronto Island: 1906, September 3, one shot by Mr. H. H. Mitchell, September 8, two seen by Mr. Mitchell; 1907, September 30, three taken; October 2, one taken, October 12, several taken; 1909, September 20, one seen; 1910, September 26, a number taken (I examined twelve, one of which was an adult), October 21, one taken, the latest record. All were young birds except the one noted.

Ægialitis meloda. PIPING PLOVER.—Though breeding at Point Pelee and other places on Lake Erie and possibly in Prince Edward County

on Lake Ontario; the Piping Plover has never been more than a migrant at Toronto till 1907, when Mr. W. R. Humphreys found two young and two eggs on the Eastern Sandbar on June 23. In 1908, a number of pairs bred along the whole lake front of Toronto Island, — a set of three eggs was found on July 1, and a downy young was taken by a boy on the same date, and another downy young was seen on June 10. I saw three pairs of old birds on July 6.

Cathartes aura septentrionalis. TURKEY VULTURE.— A young male taken at Scarboro near Toronto, November 17, 1908, was mounted by Mr. O. Spanner. Another unpublished Ontario record is copied from the journals of the late J. Hughes Samuel, December 2, 1895, Peterboro: Ontario: "Called on Elcombe the local taxidermist, he has a fine specimen of Turkey Buzzard taken on the banks of Indian river at Warsaw, 14 miles from Peterboro during the summer by a man named Spencer, the hotel keeper Morgan of Warsaw tells me that Spencer winged this bird and kept it alive for several weeks."

Astur atricapillus atricapillus. GOSHAWK.— A large flight occurred in 1906, from October 13 to November 26. I examined over a dozen from Toronto and heard of as many more that had been taken, all full plumaged birds. The flight extended east to Ottawa and a few remained about Toronto during the winter. I received one from Oakville, 19 miles west of Toronto, on January 4, 1907.

Buteo borealis krideri. KRIDER'S HAWK.— An immature bird taken at Pickering, 23 miles east of Toronto, on August 19, 1901, by Mr. W. B. Rubidge, is in my collection; this is the first Ontario record.

Buteo swainsoni. SWAINSON'S HAWK.— One taken at Toronto on October 16, 1909, an immature bird in the dark phase with yellowish markings, mounted by Mr. O. Spanner.

Scotiaptex nebulosa nebulosa. GREAT GRAY OWL.— A flight appears to have passed eastward along Lake Ontario in 1907. On January 3, I received one from Port Credit, 13 miles west of Toronto, on January 4, one from Mimico, 7 miles west, and on February 1, one from Toronto and on March 8, one from Trenton, 100 miles east of the city. Besides these I heard of a number of others that were taken. I examined two taken at Toronto, February 11 and 15, 1911.

Cryptoglaux funerea richardsoni. RICHARDSON'S OWL.— A male picked up dead but quite fresh at Toronto on June 11, 1907; the bones of both legs were crushed and gangrenous, and death was due to starvation. The bird had probably been trapped and released as it showed no traces of captivity. A female taken at Toronto January 13, 1910, is in my collection, as is the June bird.

Bubo virginianus subarcticus. ARCTIC HORNED OWL.— I examined a female of this form of Horned Owl taken together with two small downy young about April 24, 1911, at Heaslip, 123 miles north of North Bay. This breeding record explains the presence in winter of this Owl in southern Ontario.

Nyctea nyctea. SNOWY OWL. The majority of Snowy Owls that migrate into southern Ontario in winter are birds of the year, but in 1906, a flight of adults, males as far as I examined them, appeared on October 13. A very white one was taken at Toronto, on November 1, three more males were taken, two of them almost spotless, the other very white. I examined between November 19 and 26, several more exceptionally white birds from the city and three from Bradford, 40 miles north of Toronto, these were also very white birds.

Otocoris alpestris hoyti. HOYT'S HORNED LARK.— One male taken at Port Sydney, Muskoka, May 17, 1909, by Mr. Alfred Kay in whose collection the bird now is. This is probably a non-breeding bird, and was shot, together with one Horned Lark and one Prairie Horned Lark, from a small flock that had been for some time about Mr. Kay's yard.

Hesperiphona vespertina vespertina. EVENING GROSBEEK.— Small flocks visited Toronto in March, 1907, and February, 1909, and from November 23, 1910 to January 29, 1911, flocks were in and about the city. I counted twenty, many of them old males, in one mountain ash.

Calcarius pictus. SMITH'S LONGSPUR.— An immature female taken by Mr. Geo. E. Atkinson, at Port Arthur, Ontario, in September, 1892, is in my collection and is the first Ontario record. It is due to Mr. Allan Brooks' keenness that the bird was recognized in my collection, and I have since checked the identity with the aid of Dr. J. Dwight, Jr., and Dr. Louis B. Bishop, as the stage of plumage is a little known one.

Progne subis subis. PURPLE MARTIN.— There has been a noticeable increase in the number of Martins about Toronto since 1906. In 1909 one pair returned to the old nesting box in my garden that had been abandoned for several years, and bred, and in 1912, seven pairs brought off broods in the same box.

MORE NOTES ON THE MORNING AWAKENING.¹

BY FRANCIS H. ALLEN.

MR. WRIGHT's paper on 'Morning Awakening and Even-Song' ('The Auk,' July, 1912, XXIX, p. 307) has interested me not a little, and the more so that for many years I have been making occasional observations along that very line. My notes, which began in June, 1883, were made chiefly at different places within thirty miles of Boston, but I have also the record of a single morning near Mt. Katahdin in Maine. They are more fragmentary than Mr. Wright's because they often include only a few of the very earliest singers. For some birds I have more records than Mr. Wright, while for others I have much fewer and for still others which occur on his list I have none at all. My excuse for presenting a few of my own notes after his very careful and thorough records have been published is that, for one thing, they were made in different localities from his and therefore give different results in some particulars, and for another, my deductions from the evidence are at times somewhat at variance with his.

I must explain that my observations were made on various dates during these last thirty years, ranging from May 29th to July 26th, and that before computing my averages I have in every case reduced the time to terms of the summer solstice, subtracting from each record the number of minutes by which the sun rose on that date later than the time of earliest sunrise. Thus on July 26, 1906, at Weston, Mass., the Robins began singing at 3.36, but the sun on July 26 does not rise till 24 minutes later than at the solstice; I therefore deduct the 24 minutes and set the Robin's beginning at 3.12. It may also be worth while to say that the time used in this paper, as in Mr. Wright's, is Standard Time, which at Boston is 16 minutes behind the local time. To get the actual local time, therefore, for purposes of comparison with other places, 16 minutes should be added to each of these averages. The local time at Jefferson, N. H., is about 14 minutes ahead of the Standard,

¹ Read before the Nuttall Ornithological Club, October 7, 1912.

so that that amount should be added to Mr. Wright's figures to reduce them to the local time. The time of earliest sunrise is 4.07 (Standard) at Boston, and, as Mr. Wright states, 4.02 at Jefferson, where his observations were made.

In the first place I find it necessary to differ with Mr. Wright as to the order of the first three species on his list, or rather as to the high rank he accords the first two, the Song Sparrow (*Melospiza melodia melodia*) and the Chipping Sparrow (*Spizella passerina passerina*), which, so far as my observations show, belong farther down. He places these two sparrows before the Robin (*Planesticus migratorius migratorius*) on the ground that though "the lusty character of the Robin's song from the time of its beginning throughout its first forty-five minutes' period of singing constitutes it the conspicuous early singer and makes it appear to be the earliest singer of all," yet "the Song Sparrow and the Chipping Sparrow both precede the Robin in a few earlier expressions of song." Mr. Wright admits that both these species occasionally awake and sing in the night, but he says that this early morning singing — this ante-Robin singing — is differentiated from the casual night singing by the fact that a second, third, and perhaps fourth bird follows the first singer. This reasoning does not seem to me conclusive, because, for one thing, I am pretty sure I have heard the same thing happen in the middle of the night, and moreover it seems natural to infer that if a considerable period of silence ensues after a first song, then the bird has dropped off to sleep again and has not experienced his actual 'morning awakening.' It may be pertinent to call attention to the fact that Mr. Wright's earliest time of beginning to listen was 2.35 and his earliest Song Sparrow 2.40 and Chipping Sparrow 2.45. If he had himself got out a quarter of an hour earlier, might he not have heard the two sparrows correspondingly earlier also? I also suspect that Mr. Wright's Jefferson Song Sparrows and Chippies may be somewhat exceptionally wakeful birds. My own notes record not a single day when the Chippy began before the Robin and only one occasion when the Song Sparrow preceded the Robin and at the same time came near enough to get into the list at all. That was on June 11, 1885, at West Roxbury, Mass., when the Song Sparrow was heard at 2.55

and the Robin not till 3.05. The Chipping Sparrow that morning did not begin till 3.20, and I am now pretty confident that this early effort of the Song Sparrow's should have been set down as a night song. My average of eighteen records of the Robin, makes his first song at 3.04. Mr. Wright's average of twelve is 3.02, approximately the same, though it should be remembered that the earliest sunrising at Jefferson, N. H., is five minutes earlier than at Boston. My average, therefore, is actually three minutes earlier than his, but the difference is so slight that I think the two may be considered identical. This makes the contrast in our averages for the two sparrows in question the more remarkable. My average of twelve records for the Song Sparrow is 3.17 as against Mr. Wright's 2.56 for the same number; and for the Chipping Sparrow my thirteen observations average 3.21, while his twelve average 2.58.

Mr. Wright notes the hurried manner of the Chipping Sparrow's singing after he gets warmed up to it in the morning. This habit is a striking one, and I do not remember to have seen it mentioned in print before. The trills at that time are much shorter than at other times of the day and follow one another in quick succession with hardly a breath between.

If we assume that my averages of the Song Sparrow's and Chipping Sparrow's beginnings are correct and that the former starts thirteen and the latter seventeen minutes after the Robin, then these two species should appear after the Veery in Mr. Wright's list, as numbers 11 and 12. There are, however, two other species which I am sure Mr. Wright would have accorded earlier places if he had had better opportunities to hear them. One of these, the Kingbird (*Tyrannus tyrannus*), he himself suspects. His two observations, coming at 3.22 and 3.24 respectively, seemed to point to 3.23 as a safe assumption for an average, but he admits that "it is not improbable that if other records had been obtained, the Kingbird might rank somewhat earlier in the list." With me the Kingbird ranks next after the Robin. My average of ten records when I have had one in the near neighborhood places it at 3.10. I cannot tell from my own observations just how it would rank in relation to the Alder Flycatcher, the Barn Swallow, the White-throated Sparrow, the Wood Pewee, and the Vesper Sparrow, be-

cause my records of these birds are too scanty, but reckoned as six minutes after the Robin it would follow the Vesper Sparrow on Mr. Wright's list. On one occasion during the present year I heard the Wood Pewee before the Kingbird and not long after the Robin's beginning.

It may be worth while to call attention to this early-morning song of the Kingbird, for it is a true song but seems to have escaped the notice of most bird-biographers. Though heard occasionally at all times of the day, it is characteristic only of the early morning. It resembles the flight song but is usually given, I am confident, from a perch. At any rate I have often seen the bird singing while perched, and the regular early-morning performance sounds like a stationary one. It is a prolonged, ecstatic, unmusical utterance which introduces a phrase suggestive of the word *phæbe* at frequent intervals among the chattering. I observed a Kingbird in song at 6 P. M., July 16, 1911, at West Roxbury, Mass., and made the following notes on the performance: "He was perched in the top of a tall elm. The song may be written as follows: *De-de-de-de-dzip'-de-de-de-de-dzee-dzee'-it*. The *de-de-de-de* part is delivered in a stuttering fashion. Sometimes the stutter and *dzip* are given twice before the other part, or climax [the *phæbe* part] of the song is given. The song is repeated over and over continuously for an indefinite period. With the *dzeeit* the tail is spread wide. Sometimes I thought the spreading of the tailed *followed* the *dzeeit* immediately instead of being simultaneous with it, but it was hard to be sure of that at the distance I was from the bird. The tail seemed to be spread *a little* all the time, but the spreading at the climax was abrupt and pronounced. The *dzip* note is somewhat emphatic but the *dzeeit* much more so."

The other bird that deserves an early place on the list is among those listed in a group after Mr. Wright's main list, as one that "apparently had not spent the night close by, but came within hearing in an adventitious way." This is the Tree Swallow (*Iridoprocne bicolor*), for which Mr. Wright has the single record of 4.40. As a matter of fact, the Tree Swallow is one of the very earliest singers in the morning concert. Indeed, I am not sure but he is the first of them all; for, of the three mornings when I have been favorably situated to hear the first of the Tree Swallow's singing,

on May 29, 1904, both that bird and the Robin were singing when I awoke at 2.53; on May 28, 1909, the Tree Swallow was heard at 3.25 and the Robin not till 3.30 (unusually late, probably because it was a cloudy morning with drizzling rain); and on June 4th of the same year the Tree Swallow was singing at 3.03 and the Robin was not heard till 3.07.¹ Other observers have noted this habit of early rising on the part of the Tree Swallow. Mr. Ralph Hoffmann, in 'A Guide to the Birds of New England and Eastern New York' states that "near a breeding-site the male may be heard singing before dawn, either from the box, or as he flies to and fro in the darkness." The birds I have heard singing thus have been flying. It is really a remarkable performance regarded as an exhibition of endurance. As I am not aware that it has been described in full, I venture to quote from my journal the notes made May 29, 1904, at Wrentham, Mass. The bird, as stated above, was heard singing when I awoke at 2.53.

He "sang continuously, apparently without interruption, from the time I first heard him till 3.40. The song came and went, as the Swallow flew about over the pond, now nearer, now farther away, now to the right, now to the left, but never stopping,— a constant *tsip-prrup*, *tsip-prrup-prrup*, *tsip-prrup*, *tsip-prrup-prrup-prrup*, *tsip-prrup-prrup*, *tsip-prrup-prrup-prrup-prrup*, varied only by the varying number of bubbling notes following each *tsip*. The ending of the performance seemed to come gradually. After a period when I heard no song from him,— he may have been singing somewhere out of my hearing, however,— I came upon him, or another of the same species, flying about over the land in full song at 3.56. The song was then kept up till 4.05, when I saw the bird perched high on an oak tree, still singing, but after that he allowed

¹ Dr. Charles W. Townsend, in 'Birds of Essex County, Massachusetts,' gives notes on the night singing and morning awakening of the birds on the freshwater marshes of the Ipswich River at Wenham, Mass., in which the singing of the Tree Swallow is recorded. This bird began on May 22, 1904, at 2.58, thirteen minutes after the first Robin song, which was heard at the very early hour of 2.45, the sun not rising on that date till 4.16. Another note, kindly furnished to me by Dr. Townsend, makes the Tree Swallow begin five minutes after the Robin at Ipswich, Mass., June 3, 1906. On June 1, 1906, at Newton Highlands, Mass., Dr. Townsend heard the Kingbird begin singing at 3.08, two minutes after the first Robin. Dr. Townsend, by the way, permits me to say that he agrees with me as to the preëminence of the Robin over the Song and Chipping Sparrows.

his voice short intervals of rest till 4.08, when he flew off and immediately started up the continuous performance again; and I left him still at it." When one considers that not only the voice but the wings are in constant use thus for over three quarters of an hour at a time, one can only marvel at the wonderful energy and endurance of the little bird.

Mr. Wright calls the Crow (*Corvus brachyrhynchos brachyrhynchos*) "a comparatively late riser" and gives the average time of his first call from fourteen records as 3.44. My average of thirteen records is 3.33, and I suspect that the wildness and comparative scarcity of the Crow in the White Mountain region, as contrasted with its abundance and familiarity in the country about Boston, may account for this difference.

With the exception of the Oven-bird, of which I have only four records, and the Redstart, Black-throated Blue, and Blackburnian, of which I have none, my Warbler observations indicate earlier rising than do Mr. Wright's. For the Maryland Yellow-throat (*Geothlypis trichas trichas*) my six records average 3.44 as against Mr. Wright's five at 3.51. For the Black and White Warbler (*Mniotilta varia*) I have two records averaging 4.03, while Mr. Wright's single one was at 4.04. Three records for the Black-throated Green Warbler (*Dendroica virens*) give an average of 3.38, as against Mr. Wright's average of 4.13 for the same number. For three other species I have only single records made at Hurd Pond, near Mt. Katahdin, Maine, June 27, 1897. These are rather surprisingly early. They are: Myrtle Warbler (*Dendroica coronata*), 3.03 (Mr. Wright's average of three is 4.25); Nashville Warbler (*Vermivora rubricapilla rubricapilla*), 3.04 (Mr. Wright's average of two is 3.53); and Magnolia Warbler (*Dendroica magnolia*), 3.09 (Mr. Wright's average of seven is 3.55). This morning at Hurd Pond was fine and calm; the light first showed in the east at 2.15, and the rays of the sun struck the farther shore of the pond at 3.58.¹ About 13 minutes should be added to the Hurd Pond

¹ It may be of interest to record the other awakenings noted at Hurd Pond on this date. In the order heard they were: Olive-backed Thrush (*Hylocichla ustulata swainsoni*), 2.52; White-throated Sparrow (*Zonotrichia albicollis*), 2.52; Herring Gull (*Larus argentatus*), calling, 2.57; Olive-sided Flycatcher (*Nuttallornis borealis*), calling, 3.05; Golden-crowned Kinglet (*Regulus satrapa satrapa*), 3.54.

figures for purposes of comparison with Mr. Wright's, in order to allow for the earlier sunrise at that latitude and longitude, than at Jefferson, N. H., just as five minutes should be subtracted from my records made in the neighborhood of Boston to allow for the later sunrise there.

Another early-rising warbler, which Mr. Wright has not recorded, is the Yellow Warbler (*Dendroica aestiva aestiva*). My average of five records is 3.24.¹ It will be seen that I cannot from my own experience endorse Mr. Wright's conclusions as to the late awakening habits of the Warblers as a family.

These remarks of mine are not to be taken as in criticism of Mr. Wright's admirable paper, which he clearly states to be the result only of his own records and individual experience in a single locality. They are intended, rather, to be supplementary to his records and conclusions, and they may serve to emphasize the fact that more observations from a number of different localities are needed in order to enable us to generalize with safety upon this subject of the Morning Awakening. For myself, I will simply say in recapitulation that, so far as my own observations show, the Song and Chipping Sparrows are much later risers than the Robin, the King-bird is one of the very earliest of the early birds, the Tree Swallow is still earlier and may be the earliest of them all, the Crow is *not* a late riser, and neither are the Warblers as a family.

¹ Dr. Townsend has a record of 3.10 for June 13, 1908, at Ipswich, Mass., five minutes before the Song Sparrow and twelve minutes before the Chipping Sparrow.

NOTES ON SOME OF THE RARER BIRDS OF THE
PRAIRIE PART OF THE CHICAGO AREA.

BY G. EIFRIG.

DURING the three years of my residence in the small prairie town of Addison, Du Page County, Illinois, I have observed a number of birds that are rare nearly anywhere, or at least rare in this part of the state, some being first records for the county or even the so-called 'Chicago Area.' I had intended to send these observations as 'General Notes' to 'The Auk' from time to time, but lack of time prevented me, until now it seems best to put them together into one article.

Addison is situated about 20 miles west of Chicago, in undulating prairie, the highest point of which is about 350 feet above sea-level. The land is highly cultivated, except where imperfect drainage leaves spots too wet in spring. Here small remnants of the original prairie, with its interesting flora of shooting star, hawkweed, wild onion etc., may be seen. There is a large piece of woodland, containing about two square miles, but otherwise there are no trees here, if we except the usually large cotton-woods found around most farm yards. Beside the above mentioned wet spots between fields, there are some sloughs, large and small, but usually not large enough to entice ducks or Black Terns to breed, while on the other hand the King Rail, Least Bittern, Long- and Short-billed Marsh Wrens and the inevitable Redwing find even the smallest of them to their liking. Salt Creek, which flows into the Desplaines River, is the only stream of the neighborhood, but, though rich in small fish, it harbors almost no Kingfishers along its course, at least here. In fact, the absence or rarity of certain species, which should be common, as the Chipping Sparrow, Whip-poorwill, Cedarbird, Least Flycatcher, Sparrow Hawk, Mourning Dove and others, is very puzzling.— Now to the notes proper.

While gulls are a very usual sight along the lake and river in Chicago, they are rare here in Du Page County. However, two Ring-billed Gulls (*Larus delawarensis*) alighted near the out-buildings in my garden on February 26, 1910. It had been

raining and storming, and there was much water standing on the ice and snow. At such times, and during high water in the spring, Herring Gulls (*Larus argentatus*) sometimes follow the course of the then rather formidable Salt Creek as far inland as this. Of terns, I have so far seen but one Black Tern. It lingered for a few moments over a rather large slough on July 20, 1910.

A rarity for this part of the country was captured on November 11, 1911, in the shape of a Cackling Goose (*Branta canadensis minima*). It mingled with the ducks of a farmer on the creek, and, when these wended their way homeward in the evening, this northern visitor came along and was caught by the farmer's sons. I secured it and kept it alive until April 18. During this memorably cold winter, it preferred standing on the snowdrifts in its yard to staying on the straw in its hut. It refused all food except chicken feed of cracked corn, oats, etc. Later, when the flocks of geese were flying to and fro overhead — this is evidently on the highway of goose migration — the little cackling member of the tribe would signal from below, whereupon the flocks would often halt, break ranks, apparently hold a consultation, and then pass on. Its repertoire of notes — call notes and low chucklings — was quite extensive; some of them were decidedly musical, reminding one of the Redwing, Cowbird or Bobolink in late summer, others were somewhat chicken-like. When in April that particular cracked corn etc. could not, for a time, be had, the little cackler refused the choicest whole corn, or food from the kitchen and deliberately starved to death. It proved a female; a large pellet of shot was lodged against one of the wingbones, which explains the seeming lack of shyness on the day of its capture. The length was $21\frac{3}{4}$ inches, wing 14 inches, tarsus $2\frac{7}{8}$ inches.

Canada Geese (*Branta canadensis canadensis*) pass through here from January 19 (1912) to April 22 (1910). Last fall a Snow Goose (sp. ?) was taken out of a flock of 26 in a nearby slough.

In the above mentioned piece of timber the Black-crowned Night Herons (*Nycticorax nycticorax naevius*) have a nesting colony of about thirty pairs. The nests are from thirty to fifty feet up in ash and oak trees.

On May 10, 1910, while walking — or rather stumbling — through a slough, I took a Wilson's Phalarope (*Steganopus tricolor*).

While this species is not so rare in Cook County, even nesting in the extensive Calumet marshes, this is the first record, so far as the writer is aware, for Du Page County.

What birds are able to go through occasionally, without succumbing, was illustrated by a Pectoral Sandpiper (*Pisobia maculata*) which came into my hands April 20, 1910. One leg above the tarsus must have been broken some time previously, but the bones had grown together, with the foot and tarsus turned around, so that the bird was walking with one foot directed forward and the other backward. On the abdomen was a scab over an old wound with a cleft in the center an eighth of an inch deep! This must have been done by a shot or by flying against a barbed wire fence.

During the extremely hot summer of 1911 flocks of northern shore-birds were here early in July, frequenting the pastures along the creek or around the sloughs. They then were still in their almost perfect nuptial plumage and thus unusually handsome specimens of Pectoral, Red-backed and Solitary Sandpipers, of Greater and Lesser Yellow-legs, and of the Least and Semipalmated Sandpipers were to be seen. It is surprising how late the Greater Yellowlegs remain here on their northward journey — into the last week of May — and how soon they are back again, namely by the end of June and beginning of July. These are undoubtedly non-breeding birds, that do not go very far north.

On May 10, 1910, I saw a flock of about fifteen beautiful Golden Plover (*Charadrius dominicus dominicus*), also three on May 9, 1912. They are becoming rather rare in this region.

The Bob-white (*Colinus virginianus virginianus*) has become very rare in this immediate vicinity, and of the Prairie Chicken (*Tympanuchus americanus americanus*) there is but one small covey on a farm nearby, where they are protected.

When we come to the *Fringillidæ*, however, the outlook brightens for this section, although here too the rarity of the Chipping Sparrow militates against it. Redpolls and Pine Siskins are plentiful some days in autumn, winter or spring, and even the northern Grosbeaks put in an appearance from time to time. But it is for Longspurs that the region is a veritable paradise. On the exposed,

wind-swept fields they may be seen from October to May, although they sometimes seem to disappear for a few days or weeks when the winds of winter are at their highest. I said, they may be seen; that is however only partly true, for when they are on the ground, busily gleaning seeds, their color is so obliterative, that one does not see them before they are almost stepped upon and take wing. When, however, in May they have their almost perfect nuptial plumage, the males are more conspicuous, owing to the deep black throat, but even then only when moving, as the white band on the side of the neck serves to break up the outline of the form of the bird. May 4, 1912, the fields, especially newly sown oat-fields, were literally alive with thousands of *Calcarius lapponicus lapponicus*, most in their fine breeding dress. Next day the clouds of them had disappeared; a few stragglers, however, were seen as late as May 9. Among the hordes of *C. lapponicus* now and then a Smith's Longspur (*Calcarius pictus*) may be seen, a male of which I took May 1, 1912, the first record for the county.

A greater surprise awaited me on April 20, 1912, when, in walking over the old fields nearby, I saw among the many *lapponicus*, five Chestnut-collared Longspurs (*Calcarius ornatus*). I was without a gun, but they let me approach to within fifteen feet, where I watched them at leisure through the glass. I hurried home and looked at a skin of the species in my collection, from their breeding grounds, took my gun and hurried out, but did not see them again. The buffy throat of *ornatus* can, of course, not be confounded with the deep black of *lapponicus*, especially after one has seen thousands of the latter, in all plumages, and they were even then present in numbers.

Nelson's Sparrow (*Passerherbulus nelsoni nelsoni*) I have taken twice, on August 31, 1910, and on September 16, 1911. There is only one previous record of this species for Du Page County, by Mr. B. T. Gault, who writes me that a female was taken at Glen Ellyn on October 2, 1893.

For Henslow's Sparrow (*Passerherbulus henslowi henslowi*) I have an earlier date than that given for this species in Woodruff's 'Birds of the Chicago Area,' namely March 28, (1910), while it is there stated to arrive about the middle of April.

While the Dickcissel (*Spiza americana*) was very common in 1911, it was absent here this year (1912).

The Lark Sparrow (*Chondestes grammacus grammacus*) is very rare; the only small breeding colony I have seen in three years I discovered in a clearing, adjoining some fields, on April 27, 1912.

Of the rarer warblers, I have once seen the Prothonotary (*Protonotaria citrea*), a female, on May 27, 1910. The Cerulean (*Dendroica cerulea*) and Golden-winged (*Vermivora chrysoptera*) have been seen once or twice each, the former in June, indicating breeding. For the Prothonotary it is the third record for the county, according to Mr. Gault. The Connecticut Warbler (*Oporornis agilis*), so rare in most places, is rather common on some days during spring migration. The same holds good for the Gray-cheeked Thrush (*Hylocichla aliciaë aliciaë*). On certain days during the last week or ten days in May, they may be seen by hundreds in the woods, which would seem to indicate that we are here on one of their highways of spring migration.

BREEDING BIRDS OF ALACHUA COUNTY, FLORIDA.

BY OSCAR E. BAYNARD.

ALACHUA COUNTY in middle Florida is one of the richest parts of the State so far as its bird life is concerned. This is due to the diversified character of the county. The middle and western parts are rolling with plenty of pine forests, while in the southeastern part is the low lake region with dense hammocks and cypress swamps and higher tracts of pine forests. The greater part of my observation and collecting has been carried on within a radius of twenty miles of Micanopy with several trips to the Suwanee River region.

Owing to the tropical character of the lake region this County is apparently the northern breeding limit of several species.

Out of about one hundred and forty birds that breed in the State, I have found, during the past nine years, ninety-eight breeding in Alachua County, and on my place about two miles east of Micanopy sixty-six. These I have marked with a * in the list.

Bird Island, Orange Lake Reservation of the National Association of Audubon Societies is situated in this county as well as one other protected reservation, and one other large rookery will in all probability be guarded next year. There are probably more Egrets in the county than in all the rest of the State and with the vigorous protection that they are now receiving here it is hoped that they may be the means of repopulating the State with this showy and valuable bird. Water birds are now as plentiful on our flooded prairies and ponds as in the old days that we all thought had passed. In the following list I have added at the end of each paragraph the dates when I have found eggs in the nest.

*1. **Podilymbus podiceps.** PIED-BILLED GREBE.—Resident throughout the year. Not very abundant, however, in the breeding season. Nests about June 1.

*2. **Anhinga anhinga.** ANHINGA, WATER TURKEY.—Resident in great numbers. Begins to lay as early as March 10. Usually rears but one brood, but a persistent layer if disturbed, laying as many as five sets.

3. **Phalacrocorax auritus floridanus.** FLORIDA CORMORANT.—A regular visitor but an irregular breeder. Have only known of its breeding here on two occasions; once in large Cypress Swamp and once on Bird Island in Orange Lake. Nests April 10.

*4. **Anas fuvigula fuvigula.** FLORIDA DUCK.—Unknown in this county to all the old duck hunters until 1906 when it appeared on Paines Prairie and other similar places and began to nest. Resident now and appears to be increasing in numbers. Builds on islands or tussocks in the lakes and also out on the edges in the tall marsh grass and dry sedge. A specimen we have in confinement, caught when young, has mated for two years with a wild Mallard drake and has laid many eggs, none of which however have hatched. Fresh eggs about April 15.

*5. **Aix sponsa.** WOOD DUCK.—Resident throughout the year. Breeds during April and May. This beautiful Summer Duck is becoming yearly scarcer here owing to the summer shooting when the young are unable to fly well. I believe they sometimes rear two broods.

6. **Guara alba.** WHITE IBIS, CURLEW.—A regular summer visitor until 1909 when they came in the early spring and began to nest on Bird Island in Orange Lake, where they have increased steadily. Arriving about April 1, they immediately begin nest building. Usually lay three eggs, rarely four. The young are considered good eating and many fall to the guns of the so called hunters.

7. **Plegadis autumnalis.** GLOSSY IBIS, BLACK CURLEW.—I first found this rare and beautiful bird breeding here in 1909 on Bird Island in Orange Lake. Nests April 1 to May 1. Will lay two to three sets if disturbed.

8. **Mycteria americana.** WOOD IBIS, FLINT HEAD.—The last breeding record I have for this County is 1906, when they bred in numbers in a Cypress Swamp in the northeastern part of the county. This rookery of about 1500 nests was nearly exterminated by men and boys who shot the young from the trees, evidently just to see them fall. After the nesting season they come here and feed all summer on our lakes. Fresh eggs about March 15.

9. **Botaurus lentiginosus.** BITTERN.—Resident throughout the year but a rare breeder. One nest found June 15, 1911, near Micanopy by H. H. Simpson.

*10. **Ixobrychus exilis.** LEAST BITTERN.—An abundant resident. Commences to nest in early April, and usually rears two broods.

*11. **Ixobrychus neoxenus.** CORY'S LEAST BITTERN.—Very rare and found only during four years of the nine I have lived in the county. Almost always found in or near small saw grass patches on two certain lakes. Probably more abundant than would appear from its fondness for the almost impenetrable saw grass. Fresh eggs April 20.

12. **Ardea herodias wardi.** WARD'S HERON.—Abundant and resident. Nests in large numbers in rookeries in cypress swamps in February and early March. Have found a few, however, nesting with the small Herons and Egrets in willow ponds and on Bird Island.

13. **Herodias egretta.** EGRET, LONG WHITE.—This beautiful bird was fairly abundant when I first came here, but is now limited to about 300 pairs, nearly all of which are in our protected rookeries. April 1 to 15.

*14. **Egretta candidissima candidissima.** SNOWY EGRET.—Never very abundant during my residence here. Our protected rookeries here shelter the remnant of this showy bird. Not over 250 pairs now left and these have increased from the four pairs that I began guarding three years ago. March 25 to April 10.

*15. **Dichromanassa rufescens.** REDDISH EGRET.—Abundant during 1907 and 1908. Found about 1500 pairs on Bird Island and many straggling pairs in many other localities. One pair only nested in 1911, and have only seen one pair this year.

*16. **Hydranassa tricolor ruficollis.** LOUISIANA HERON.—Abundant and breeds in great numbers throughout the county. March 20 to April 10.

*17. **Florida cærulea.** LITTLE BLUE HERON.—Abundant, in fact the most numerous of all the Herons, breeding in all parts of the county in small ponds in woods, fields and swamps and islands in the lakes. March 20 to April 10.

*18. **Butorides virescens virescens.** GREEN HERON.—Found in all parts of the County, occasionally breeding alone, but more often in rookeries with other Herons. April 1 to 30.

19. **Nycticorax nycticorax naevius.** BLACK-CROWNED NIGHT HERON.— This heron, locally called the 'Night Scrooglin,' is abundant and breeds usually earlier than the other herons. Builds in a cypress swamp as a rule, but many are found on Bird Island. March 1 to 15.
20. **Nyctanassa violacea.** YELLOW-CROWNED NIGHT HERON.— Not as abundant as the preceding species. Have found them nesting in the same swamp, but never with them. Nests March 25 to April 10.
21. **Grus mexicana.** SANDHILL CRANE.— Resident but rare. Nests in late April on the flooded prairies of two lakes.
22. **Aramus vociferus.** LIMPKIN.— This strange bird was fairly abundant here formerly, but is now a very rare breeder and in only one swamp to my knowledge. Breeds from November to June, the height of the breeding season being in April and May. I fear that this bird will soon be extinct in the State.
23. **Rallus elegans.** KING RAIL.— Resident but only tolerably common. Nests in early May in the marshes of our lakes.
- *24. **Creciscus jamaicensis.** BLACK RAIL.— Summer resident but very rare. Never found a nest but saw an adult with three young on one occasion in early June.
- *25. **Ionornis martinicus.** PURPLE GALLINULE.— An abundant resident, and breeds on all the lakes and ponds where the Bonnetts (*Nuphar advena*) is abundant. Nests from March to August and usually rears two broods.
- *26. **Gallinula galeata.** FLORIDA GALLINULE.— Common resident, but not as abundant as the preceding species. Nests from March to July. Inhabits practically the same localities as the Purple Gallinule but usually nests nearer to the water and in the floating masses of Penny-wort (*Hydrocotyle ranunculoides*), the eggs being sometimes wet.
27. **Fulica americana.** COOT.— Here in thousands during the winter and many remain during the entire year. A very rare breeder, found one nest being occupied but eggs were not laid in it for some reason. Killed two females in June of this year, full of eggs that would have been ready to lay in a week's time. I have no doubt but that it does nest here occasionally.
28. **Philohela minor.** WOODCOCK.— Resident, but rare. Two nests found this year on February 4, by H. H. Simpson, near Micanopy. One nest contained a set of three eggs, the other had been broken up. This is the second breeding record I know of for Florida.
- *29. **Oxyechus vociferus.** KILLDEER.— Abundant resident, nests here in fields near some pond or lake in early April.
- *30. **Colinus virginianus floridanus.** FLORIDA BOB-WHITE.— An abundant resident and despite the great numbers killed annually, seems to be more than holding its own. Nests in early April and usually rears two broods. Have found nest with eggs as late as Sept. 15.
31. **Meleagris gallopavo osceola.** FLORIDA WILD TURKEY.— This noble game bird is rapidly nearing extermination in this section, due not so

much to hunting, as to the cultivation of the hammocks and woods where it nests. Full sets are found here about April 15.

*32. *Zenaidura macroura carolinensis*. MOURNING DOVE.— Resident and seems to be increasing notwithstanding it is a game bird. This is due to the education of our farmers who are beginning to realize the great worth of the Dove. Fresh sets May 1.

*33. *Chæmepelia passerina terrestris*. GROUND DOVE.— Abundant and resident. Known locally as the 'Moaning Dove.' Have found them breeding every month of the year except December and January. Builds as often in orange trees as on the ground.

34. *Cathartes aura septentrionalis*. TURKEY VULTURE.— Common resident and breeds here to some extent in April and early May.

*35. *Catharista urubu*. BLACK VULTURE, CARRION CROW.— An abundant, resident species, nesting in the county by the thousands in the thick swamps, hammocks, and saw palmetto patches. Nests from February to June. Young are about fourteen weeks old before they can fly.

*36. *Circus hudsonius*. MARSH HAWK.— A common resident and pretty generally protected by the farmers who know it as the 'Rabbit Hawk.'— Nests here on our lakes on the high tussocks of saw grass and *Sagittaria* in May and early June.

37. *Accipiter velox*. SHARP-SHINNED HAWK.— Every man's hand here is against the 'Blue Darter,' and it is not as abundant as formerly when it bred in great numbers from April 15 to May 1.

38. *Accipiter cooperi*. COOPER'S HAWK.— Rare. Have found only two nests in the county in nine years. Fresh eggs about March 15.

39. *Buteo borealis borealis*. RED-TAILED HAWK.— Resident but rare. Nests in very tall pines early in March.

*40. *Buteo lineatus alleni*. FLORIDA RED-SHOULDERED HAWK.— Resident and fairly abundant. Nests from February 15 to March 25.

41. *Buteo platypterus*. BROAD-WINGED HAWK.— A very rare bird for this section and found only one nest with two young on May 28, 1909.

42. *Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.— Resident and formerly tolerably common, having known of 20 occupied nests in one year. Not holding its own now as every hog raiser in the county kills every one he can on account of the Eagle's perverted taste for razor back pig. Nests about the 10th of December in the tallest pine trees we have and often lays a second set if first is disturbed. Usually lays two eggs.

*43. *Falco sparverius paulus*. LITTLE SPARROW HAWK.— A common resident and pretty evenly distributed throughout the county. Seldom molested as its great love for grasshoppers is well known to the farmers. Usually nests about April 15.

44. *Pandion haliaëtus carolinensis*. OSPREY.— Abundant and increasing rapidly. Very erratic in its nesting, and fresh eggs can be found from early February to late May.

45. **Aluco pratincola.** BARN OWL.— A very rare resident and only found near Paines Prairie. Nests in early November.

*46. **Strix varia alleni.** FLORIDA BARRED OWL.— A common resident and abundant in the hammock regions. Seldom molested as their fondness for rabbits is well known. Nests about January 10.

*47. **Otus asio floridanus.** FLORIDA SCREECH OWL.— An abundant resident and breeds April 10 to 25.

48. **Bubo virginianus virginianus.** GREAT HORNED OWL.— Resident but our rarest owl. Breeds here about January 15, usually in an old Eagle's nest.

*49. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.— A common breeder and pretty evenly distributed. Nests from late April to August.

*50. **Ceryle alcyon alcyon.** BELTED KINGFISHER.— Common resident and nests in early April in holes in dead trees and stubs over water. Never found them nesting in cavities in banks as in the north.

51. **Campephilus principalis.** IVORY-BILLED WOODPECKER.— Very rare. Found one nest in the County that contained young. Fresh eggs about February 15.

52. **Dryobates villosus auduboni.** SOUTHERN HAIRY WOODPECKER.— Rare; nests here in very limited numbers in late April and early May.

53. **Dryobates pubescens pubescens.** SOUTHERN DOWNY WOODPECKER.— Regularly nests here in limited numbers in May.

*54. **Dryobates borealis.** RED-CKOADED WOODPECKER.— Not very common until the last three years, but now a common breeder. Nests about May 1.

*55. **Phlœotomus pileatus pileatus.** PILEATED WOODPECKER.— The 'Lord-God,' as he is known in this section, is one of the commonest woodpeckers in the county nesting in the hammocks and cypress swamps in early April.

*56. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— Abundant, nesting from early May to late June.

*57. **Centurus carolinus.** RED-BELLIED WOODPECKER.— Common resident and nests April 1 to May 15.

*58. **Colaptes auratus auratus.** FLICKER.— Abundant and nests from March to June.

*59. **Antrostomus carolinensis.** CHUCK-WILL'S-WIDOW.— Common and nests from April 10 to June 1.

*60. **Chordeiles virginianus chapmani.** FLORIDA NIGHTHAWK.— An abundant summer resident and nests from April 15 to late in May.

*61. **Chætura pelagica.** CHIMNEY SWIFT.— Summer resident but only tolerably common. Nests from May 15 to June 10.

*62. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.— Common and nests from May 10 to June 25.

*63. **Tyrannus tyrannus.** KINGBIRD.— Very abundant, nesting about May 10.

*64. *Myiarchus crinitus*. CRESTED FLYCATCHER.— Abundant, nesting about May 10.

*65. *Myiochanes virens*. WOOD PEWEE.— Rare, nests in early June.

*66. *Cyanocitta cristata florincola*. FLORIDA BLUE JAY.— Abundant, nesting from early March to July.

67. *Aphelocoma cyanea*. FLORIDA JAY.— Very rare and only found nesting in the county once. April 16.

*68. *Corvus brachyrhynchos pascuus*. FLORIDA CROW.— Resident but in limited numbers, nesting from late March to April 15.

*69. *Corvus ossifragus*. FISH CROW.— Abundant, large numbers using Bird Island for a roost. Nests in late April in tall slim pines on edges of the lakes.

*70. *Agelaius phoeniceus floridanus*. FLORIDA RED-WING.— Very abundant resident and nests from March 15 to July 15. Raises two and three broods.

71. *Sturnella magna argutula*. SOUTHERN MEADOWLARK.— Locally abundant in some parts of the county. Nests late in April.

*72. *Icterus spurius*. ORCHARD ORIOLE.— A rare summer visitor nesting in early June.

*73. *Quiscalus quiscula aglæus*. FLORIDA GRACKLE.— Abundant resident breeding in April and May in orange and pear groves and occasionally in a small pine on the edge of some lake.

*74. *Megaquiscalus major major*. BOAT-TAILED GRACKLE, JACKDAW.— Our most abundant blackbird, resident, and nests from March 1 to July, usually rears two broods.

75. *Ammodramus savannarum floridanus*. FLORIDA GRASSHOPPER SPARROW.— Very rare and probably nests in May as found one pair with young that could barely fly late in June on Paines Prairie.

*76. *Peucea æstivalis æstivalis*. PINE-WOODS SPARROW.— Tolerably common and nests from April 15 to 30.

*77. *Pipilo erythrophthalmus alleni*. WHITE-EYED TOWHEE, JOREE.— Abundant resident and nests in April, May and June. Some years apparently more abundant than others.

*78. *Cardinalis cardinalis floridanus*. FLORIDA CARDINAL.— Abundant resident, breeding from April to September. Found nest with young September 15, 1910.

*79. *Piranga rubra rubra*. SUMMER Tanager.— Common and nests in early May.

*80. *Progne subis subis*. PURPLE MARTIN.— Common breeder and nests from April 1 to May 1.

*81. *Lanius ludovicianus ludovicianus*. LOGGERHEAD SHRIKE.— Abundant resident, nesting from early February to July. Rears two to three broods.

*82. *Vireosylva olivacea*. RED-EYED VIREO.— Common, nests in early May.

*83. *Vireo griseus griseus*. WHITE-EYED VIREO.— Abundant, nesting from April 1 to May 15.

- *84. **Compsothlypis americana americana.** PARULA WARBLER.— Abundant and nests in early April in the cypress swamps.
- *85. **Dendroica vigorsi.** PINE WARBLER.— Common, nesting in early March in the highest pines in a bunch of the pendant Florida Long Moss.
- *86. **Geothlypis trichas ignota.** FLORIDA YELLOW-THROAT.— Very abundant around lakes and swamps and nests in late April and early May.
- *87. **Dendroica discolor.** PRAIRIE WARBLER.— Not common, nesting in late April.
- *88. **Mimus polyglottos polyglottos.** MOCKINGBIRD.— Abundant, resident, nesting from March to August.
- *89. **Dumetella carolinensis.** CATBIRD.— Common winter resident, but a rare breeder. Nests about April 15.
- *90. **Toxostoma rufum.** BROWN THRASHER.— Common winter resident and breeds in small numbers about April 16.
- *91. **Thryothorus ludovicianus miamensis.** FLORIDA WREN.— Abundant and bred here in great numbers until past two years, when, for some cause, they moved further south. Still common, however. Nests from March to July and rears two or more broods. One set of eggs I collected at Micanopy are typical eggs of the Carolina Wren, and the bird as seen at very close range I took to be the Carolina Wren. I note, however, that Mr. Ridgway regards all our county birds as the Florida Wren and Mr. Stone also assures me that the Carolina Wren does not nest in Florida.
92. **Sitta carolinensis atkinsi.** FLORIDA WHITE-BREASTED NUTHATCH.— Rare; breeds here in early March in small numbers.
93. **Sitta pusilla.** BROWN-HEADED NUTHATCH.— Abundant and breeds from February to May, usually rearing two broods.
- *94. **Bæolophus bicolor.** TUFTED TITMOUSE.— Abundant and nests from early February until April.
- *95. **Penthestes carolinensis.** CAROLINA CHICKADEE.— Common breeder from early February until June.
- *96. **Polioptila cærulea cærulea.** BLUE-GRAY GNATCATCHER.— Common resident and breeds in early April.
- *97. **Sialia sialis sialis.** BLUEBIRD.— Common resident and nests from March to June.
98. **Passer domesticus.** ENGLISH SPARROW.— This pernicious nuisance is abundant over the entire county.

WHAT THE AMERICAN BIRD BANDING ASSOCIATION
HAS ACCOMPLISHED DURING 1912.¹BY HOWARD H. CLEAVES.²

SINCE it is obvious that this report will fall into the hands of many who are not cognizant of the facts relating to the origin, growth and present status of the bird banding movement in America it might not be amiss to devote a brief space at the outset to a review of that phase of the subject. The mystery of bird migration has tickled and agitated the lay mind and engaged the attention of the ornithologist for we know not how long, and although much has been ascertained by field observers with regard to dates of arrival and departure at given points of the majority of migratory species, practically nothing is known of the movements of individual birds. Even Audubon became interested in this problem, for we read that he placed silver wire rings about the tarsi of a brood of young Phœbes and was rewarded the following year by discovering two of these birds nesting in the same vicinity. Whether through reading of this interesting incident, or hearing of the splendid efforts put forth by certain Europeans who began banding birds as early as 1899, or by reason of a spontaneous desire to investigate, it would be difficult to tell, but the fact remains that not later than 1902 individual experimenters in this country engaged themselves in earnest and comparatively extensive efforts to cast light on the wanderings of birds by the use of inscribed metal bands or rings.

Not until 1908, however, did anything approaching a concerted bird banding movement develop. During that year certain members of the New Haven (Conn.) Bird Club did a small amount of banding, but, realizing how unavailing were the efforts of so few, decided to carry the cause before the Congress of the American Ornithologists' Union at Cambridge, Mass., in November. There

¹ For previous reports of bird banding work in America see 'The Auk,' Vol. XXVI, No. 2, pp. 137-143, April, 1909, and 'The Auk,' Vol. XXVII, No. 2, April, 1910.

² Address communications to Howard H. Cleaves, Sec'y-Treas., Public Museum, New Brighton, N. Y.

it met with favor and the demand by members of the Union for bands became so pronounced that 5000 were issued prior to the close of the nesting period in 1909. Of this number approximately 1000 were actually placed on birds, and there resulted from these about 30 return records by the end of the year. With interest aroused, the time seemed ripe to give the movement a more concrete form than it had hitherto assumed, the result being that some thirty members of the A. O. U. assembled in New York on the evening of December 8, 1909, and organized the American Bird Banding Association.

Dr. Leon J. Cole, who had been so successfully pushing the work, was chosen President, and together with four able colleagues made up the Executive Committee. In the spring of 1910, however, Dr. Cole was permanently called to Madison, Wis., and partly as a result of his absence, and also on account of the pressing business affairs of all members of the Committee and their widely separated places of residence, the activities of the Association were destined to meet with a serious setback. Practically nothing was accomplished during 1910 nor in 1911, but in the fall of the latter year the Linnæan Society of New York offered to foster the work, much to the relief of those previously encumbered with it. A committee (consisting at first of three and subsequently of five) was appointed and a campaign to raise funds in preparation for the nesting season of 1912 was inaugurated and carried forward with considerable success.

At the outset a change in the type of bands seemed advisable and after inquiring among as many as six different European bird banding organizations the style used by Country Life, London, was adopted. Seven thousand five hundred of these bands, of eight different sizes and bearing the inscription 'NOTIFY AM MUSEUM N. Y' instead of 'NOTIFY THE AUK N Y' were ordered. For the purpose of keeping an exact record of every band issued a special ledger was designed and a filing cabinet for record cards and correspondence was purchased. As the spring of 1912 approached post cards were sent out requesting that applications for bands be submitted. So vigorous was the response resulting from these cards and from notices in 'The Auk,' 'Bird-Lore,' 'Country Life in America' and elsewhere, that four thousand one hundred and

seventy-three bands were distributed among forty-four persons residing in various parts of the country, and representing such widely separated territories as Nova Scotia, Montana and Florida. All told, eight hundred of the bands issued this year (1912) have been actually placed on birds and some of these have already yielded return records possessing a high degree of interest. The total number of *species* banded during the past season is seventy-three, of which the following is a summary:

Species.	No. banded in 1912.	Species.	No. banded in 1912.
Black Guillemot	2	Great Crested Flycatcher	5
Great Black-backed Gull	41	Phoebe	19
Herring Gull	72	Olive-sided Flycatcher	2
Least Tern	7	Blue Jay	9
Leach's Petrel	21	Western Crow	2
White Ibis	28	Bobolink	1
Glossy Ibis	10	Cowbird	2
Bittern	1	Red-winged Blackbird	4
American Egret	145	Thick-billed Redwing	8
Snowy Egret	30	Meadowlark	6
Louisiana Heron	21	Western Meadowlark	5
Little Blue Heron	17	Orchard Oriole	1
Green Heron	2	Brewer's Blackbird	18
Black-crowned Night Heron	10	Purple Grackle	1
Spotted Sandpiper	19	House Finch	1
Killdeer	2	Chestnut-collared Longspur	1
Piping Plover	3	Western Vesper Sparrow	1
Mourning Dove	4	House Sparrow	1
Marsh Hawk	4	Savannah Sparrow	20
Barn Owl	6	White-throated Sparrow	1
Short-eared Owl	8	Chipping Sparrow	6
Screech Owl	2	Field Sparrow	4
Yellow-billed Cuckoo	3	Slate-colored Junco	9
Yellow-bellied Sapsucker	1	Song Sparrow	15
Red-headed Woodpecker	2	Towhee	2
Flicker	25	Cardinal	3
Chimney Swift	5	Rosebreasted Grosbeak	1
Arkansas Kingbird	10	Indigo Bunting	3



1. BANDING BLACK-BACKED GULLS IN THE LAKE GEORGE, N. S. COLONY.
2. YOUNG BLACK-BACKED GULL WITH BAND ON FOOT.



Species.	No. banded in 1912.	Species.	No. banded in 1912.
Dickeissel	2	Louisiana Water-Thrush	3
Scarlet Tanager	2	Catbird	7
Purple Martin	3	Brown Thrasher	9
Barn Swallow	49	Chickadee	5
Red-eyed Vireo	3	Wood Thrush	4
Black and White Warbler	1	Robin	22
Yellow Warbler	8	Western Robin	12
Myrtle Warbler	1	Bluebird	16
Black-throated Green Warbler	1		

The activity of certain of the banders in the field has been remarkable and their observations often noteworthy. For instance, Mr. Oscar E. Baynard, in charge of Bird Island in Orange Lake, Florida, writes that in placing some two hundred and fifty bands on White and Glossy Ibises, Egrets, and Louisiana, Black-crowned Night and Green Herons it was necessary for him to wade about up to his knees in soft mud and guano while the temperature averaged ninety-four degrees in the shade. Mr. Baynard says further:

"I note a White Ibis that I banded last year is nesting here this year, although I cannot determine the number. Have noted two long whites nesting here this year that were here last year — one adult with deformed leg and a youngster with a deformed foot. This last year's youngster has a nest of its own this year and the old one has built in the same bush she used last year. Next year I'll probably be able to note a lot of banded birds returning here to nest."

Mr. A. A. Saunders, of the Forest Service of Montana, is practically the only person doing any banding work in the west, but he is a host in himself and loses no opportunity to put his bands to good use while ranging over his territory. In a letter dated June 25, 1912, Mr. Saunders says:

"I was recently told of an incident of a marked bird returning to the place where it was born, and got as many of the facts as possible, as I believe they will be of interest to the association. The incident was told me by Mr. E. A. Woods, a Forest Ranger on the Lewis and Clark National Forest, and while this information

comes second hand, I believe it is correct. A lady living near Mountain View, Alberta, just north of the United States boundary, found the nest of a Canada Goose and hatched out the eggs under a hen. The young geese lived in the barnyard that summer, and one was marked, by fastening a bell around its neck. In the fall, when a flock of migrating geese flew over, the geese left the barnyard, and joined this flock. Two years later, in the spring, the goose wearing the bell returned and stopped in the barnyard for a few days."

Mr. Ernest Harold Baynes, of Meriden, New Hampshire, is one of the most energetic and faithful banders at present engaged in the work, notwithstanding his many other activities. He tells of a flock of 125 White-winged Crossbills that fed near his home last winter. The birds were so tame that Mr. Baynes had but to stoop and pick them up when he wished to place bands on their legs. Members of the Meriden Bird Club have put up many nesting boxes for Chickadees, Bluebirds, etc., and numbers of these small birds have been banded. Indeed, it goes without saying that any bird that falls into the hands of Mr. Baynes wears a ring on its leg when released.

Mr. Harrison F. Lewis, of Yarmouth, Nova Scotia, is another who has accomplished much in the matter of banding the smaller birds. Mr. Lewis told me that when the school children living in the country near him heard of his banding work they all set out to find birds' nests and report them to him. Thus a double end was accomplished — Mr. Lewis was enabled to band dozens of birds without spending much of his own valuable time in looking for nests; and, best of all, the children of the countryside suddenly took a rousing interest in bird life, although perhaps unwittingly. What these children were really keen about was to watch the placing of the tiny aluminum bands on the birds' legs, but to locate the young birds the nests had to be found and in order to find the nests it was necessary to follow the movements and watch the habits of the old birds. It is often difficult to induce children simply to observe things if they think you are trying to make them acquire some knowledge by doing so, but here was a new idea, a material end to be accomplished — something to do. There is no reason why the work of banding birds should not work a similar miracle among

adults — it adds a vigorous interest to bird study; arouses latent interest; or even preserves interest when it tends to wane.

These few cases of the activities of field agents are cited as examples of what hundreds of ornithologists should be doing throughout the continent of North America. Bird banding is not the work of a limited circle but the duty of many, and it is only by extensive banding that results of value can be obtained. Realizing these facts, it has been thought best to welcome the cooperation of all competent bird lovers, regardless of the matter of contributions or annual dues. Any one deemed properly qualified by the Committee may apply for bands and will receive them. On the other hand it is hoped that there are enough people who sufficiently appreciate the value of the work to sustain the necessary financial burden.

A year ago many persons declined to support the work of bird banding on the grounds that not sufficient results had been obtained to establish its practicability. The following return records of banded birds, received within the past twelve months, should rob this objection of its foundation.

On June 7th, 1911, an adult Chimney Swift fluttered down a chimney into the study of Mr. Ernest Harold Baynes in Meriden, New Hampshire, and was promptly banded and released. The band was of the old style and bore the number 6326. At eight o'clock P. M. on June 15, 1912, two Chimney Swifts flew from the chimney into the same room of Mr. Baynes' house where the bird had been caught a year and eight days before. And lo! when these birds were taken in hand and examined one of them proved to be 6326. Remarkable as it may seem, this diminutive creature, less than six inches in length, had travelled hundreds of miles to Central America or elsewhere in the tropics where he spent the winter and then had made the long return journey at the approach of summer and found again the chimney of his choice in a village of far-off New Hampshire. And throughout his journeyings the little aluminum ring had travelled with him and had produced not the least effect on the bird's leg.

Two French Canadians were gunning along a small river near the hamlet of Whitebread in southwestern Ontario, Canada, on August 5, 1912. Blackbirds, their intended booty, were not

numerous and the men were about to return to camp when one suddenly touched the other on the arm and said "You cannot hit him!" In answer to this challenge the second gunner wheeled quickly about and took a difficult chance shot at a fast disappearing Common Tern. There were many terns flying up and down the stream, hovering in the air and plunging for minnows, and it seems strange that the one shot should have borne a band on his leg. The finding of that band resulted in the following letter:

"Dear Friends

As I have never seen you's before but I am writing a few lines to tell you about a ring or piece of tin I found on a sea gull or sea bird. There is thousands of them here but I will not try it again. In examining the bird I found on the left leg 'Notify the Auk or Ark 4590 New York.' So I am doing so to let you know how far this bird travelled. Well I will close. Please write back and let me know if you got this scribbling.

from

August 5th, 1912.

Leo Salois, Box 14, Whitebread, Ont."

On referring to number 4590 among the original banding records it was found that the bird in question had been marked when about two weeks old at Saint Clair Flats Canal, Michigan, on August 13th, 1909, by Mr. S. A. Courtis. By correspondence with Mr. Salois it was learned that the terns were apparently not nesting at Whitebread, Ontario, and it is not unlikely that the birds seen there had bred at Saint Clair Flats and were indulging in a little roving after the nesting season. However this may be, the facts remain that the dead Tern had worn the aluminum anklet for three years minus eight days; had likely made three round trips to the Gulf of Mexico or some other place in the tropics to spend the winter each year since 1909; and was shot but a comparatively short distance from the spot where he was hatched.

A farmer by the name of August Schilling of Evansville, Illinois, was walking across his fields on April 1, 1912, when he frightened a Butcher-bird from a fence post where it had been feeding on what proved to be a Bluebird. On picking up the victim and scrutinizing it Mr. Schilling was astonished to discover that the bird wore a ring on its right leg, and that the ring bore an inscription. He

wrote a letter to 'The Auk,' New York, giving the number of the band, and asked for information, saying:

"Please let me know when the band was put on. There are lots of people would like to know."

This particular Bluebird was one of a brood banded by Dr. R. M. Strong, of the University of Chicago, at West Allis, Wisconsin, on July 5, 1909. The band had been carried for two years and nine months and had apparently caused no inconvenience. It is probable that this Bluebird had made two complete migrations to the south and was about to complete the last lap of a third when he was so unfortunate as to cross the path of *Lanius borealis*.

The letters sent in by persons who have come into possession of banded birds are often intensely interesting, containing information regarding the conditions under which the bird was secured that makes a story of unique character when one goes to the filing cabinet, picks out the banding record and puts the two halves of the tale together. The following is a good example: The owner of a rice plantation on the Lower Cambahee River, Colleton County, South Carolina, sent in word that on November 2, 1912, his 'bird minder' (a man stationed with a gun in the 'rice yard' for the purpose of keeping birds away from the grain) had shot a number of Red-winged Blackbirds and was preparing them for a pot pie when he came upon one wearing a small metal band on its leg. What could be more fraught with interest? The man had, of course, given the number of the band and we at once picked out the card bearing the record of banding and supplied the other end of the story. We found that the bird was banded as a fledgling by Mr. Harry S. Hathaway at Quonochontaug, Charleston, Rhode Island, on June 8, 1912. On being notified of the 'return' Mr. Hathaway wrote:

"I well remember this young Red-wing. I was wading through a small cattail swamp looking for Red-wings' nests when I spied him clinging to a cattail about 2 feet from the water. I made a grab and had him in my hand and a band on in a jiffy. A toss in the air and he awkwardly flew some 20 feet and succeeded in grasping an upright cattail and clung there while I went on."

Who would have supposed that the young Red-wing, reared in a Rhode Island cattail swamp in June, would end his career in a pot pie in South Carolina five months later?

Almost every record that has come in is characterized by some distinguishing feature and would furnish reading matter as interesting as the several returns cited above. Lack of space, however, prevents the publication of these embellishments, although the reader may gather much from the banding and return records in their condensed form at the end of this paper. The percentage of returns, contrary to the predictions of some, has indeed been encouraging; and the point that should be emphasized in connection with these is that they have not in a single instance been due to the handicapping of the birds by the bands. This is proved, firstly, by the fact that the bands have been carried by the birds for such long periods; secondly, by reason of the very conditions attending the taking of each bird; and thirdly, by the fact that the presence of the band on the bird's leg was not in a single case detected until the bird was taken in the hand and examined, and therefore could not possibly have prompted any one to kill the bird for the purpose of recovering the band and satisfying his own curiosity. This sort of thing, by the way, is and should be strongly denounced and discouraged. It is rather the interest in watching for banded birds and even photographing them that should be encouraged.

It would not be wise to spring at conclusions with regard to the significance and meaning of the return records that have thus far been secured. The fact that Mr. Baynes' Chimney Swift returned to its old stand after an absence of nearly a year in the tropics is significant in itself; but before stating that, barring accident, Chimney Swifts invariably return year after year to the same chimney it would be advisable, not to say necessary, to obtain a dozen or even a hundred similar records as corroborative evidence.

Beyond a doubt the greatest progress in the work of banding birds in America has been made during the year just past, but the pace established in that time must be not only maintained but greatly increased. Our interest and enthusiasm must not decline for a moment; the work and aims of the American Bird Banding Association must receive the most zealous support that American ornithologists are capable of imparting.



1. YOUNG MOURNING DOVES, BANDED AT STATEN ISLAND, N. Y. CITY.
2. CHIMNEY SWIFT, BANDED AT MERIDEN, N. H.
3. BARN OWL, BANDED AT STATEN ISLAND, N. Y.



RETURN RECORDS.

(a) The returns in this division are from the old lot of bands issued by Dr. Cole in 1909.

7287. HERRING GULL. *Larus argentatus.*

Banded at Falls Pond, Hamilton County, N. Y., by Francis Harper.

June 27, 1910.

Downy young.

Recovered at Barnegat Inlet, N. J., by William H. Lewis.

September 11, 1911.

Found alive but apparently sick, on the shore.

4590. COMMON TERN. *Sterna hirundo.*

Banded at Saint Clair Flats Canal, Mich., by S. A. Courtis.

August 13, 1909.

About two weeks old. 'On bare sandy island left from dredging of new canals. Birds from one to four weeks of age found there.' S. A. C.

Recovered at Whitebread, Ontario, Canada by Leo Salois.

August 5, 1912.

Shot: birds did not seem to be breeding here and probably wandered over from Saint Clair Flats, after the breeding season.

6625. SPOTTED SANDPIPER. *Actitis macularia.*

Banded at House Is. (Four Bros. Islds.) Lake Champlain, N. Y. by Francis Harper.

July 7, 1910.

Downy young 'caught on July 8 and July 9, examined and found to be in good condition.' F. H.

Recovered at Squantum, Mass., by Hayden Crocker.

September 6, 1910.

Shot among a flock of smaller sandpipers 'on a mudbank in a salt marsh. Did not notice band on leg until I was dressing bird.' H. C.

5557. NORTHERN FLICKER. *Colaptes auratus luteus.*

Banded at Logan Park Cemetery, Sioux City, Ia., by Prof. T. C. Stephens.

June 11, 1910.

Male nestling, one of a brood of seven.

Recovered at Bayard, Kas., by I. Decker.

November 20, 1910.

Captured in a barn; injured in capturing and afterwards killed. Band was not noticed until the bird was dead.

6326. CHIMNEY SWIFT. *Chaetura pelagica.*

Banded at Meriden, Sullivan Co.,
N. H., by Ernest Harold
Baynes.

June 7, 1911.

Adult: 'This bird and another
came down the chimney and
into my study at 8 P. M. It
was almost dark when we liber-
ated them.' E. H. B.

Recovered at Meriden, Sullivan
Co., N. H., by Ernest Harold
Baynes.

June 15, 1912.

Caught in a room. 'The leg
to which the band was at-
tached appeared normal in
every way.' E. H. B.

955. RED-WINGED BLACKBIRD. *Agelaius phœniceus phœniceus.*

Banded at Berwyn, Chester Co.,
Pa., by Leonard S. Pearson.

June 6, 1909.

Fledgling: 'had just left nest.'
L. S. P.

Recovered at Lansdowne, Dela-
ware Co., Pa., by H. L. Henry.
September 1, 1909.

Shot.

5838. FIELD SPARROW. *Spizella pusilla pusilla.*

Banded at Sioux City, Ia., by
Prof. T. C. Stephens.

June 11, 1910.

Fledgling.

Recovered at Sioux City, Ia., by
A. Kirkegaard.

May 23, 1911.

No information as to how it was
obtained.

3429. WESTERN HOUSE WREN. *Troglodytes ædon parkmani.*

Banded at Milwaukee, Ore., by
William L. Finley.

July 31, 1909.

Nestling.

Recovered at Woodburn, Ore., by
Son of J. G. Martzoff.

June 26, 1910.

Found in watering tank. Wood-
burn is about 30 miles south of
Milwaukee.

251. ROBIN. *Planesticus migratorius migratorius.*

Banded at Kingston, R. I. (Or-
chard of Agricultural College)
by Leon J. Cole and Wm. F.
Kirkpatrick.

August 4, 1908.

Half-fledged bird from 'nest
about 10 ft. up in an apple tree.'
L. J. C.

Recovered at Kingston, R. I.
(Poultry plant of Agricultural
College) by Wm. F. Kirk-
patrick.

April 9, 1909.

'Presence of band was unknown
until bird was in the hand.
Specimen taken to aid in
pathological work at station.
Band had caused no abrasion
or other injury to foot.'
L. J. C.

1212. ROBIN. *Planesticus migratorius migratorius.*

Banded at Bangor, Me., by Ora
Willis Knight.

July 8, 1910.

'Young bird found on ground
barely able to fly. Banded
and released.' O. W. K.

Recovered at Nashville, Tenn., by
J. G. Jenkins.

February 21, 1911.

'Captured.'

2376. ROBIN. *Planesticus migratorius migratorius.*

Banded at Westbrook, Cumber-
land Co., Me., by Arthur H.
Norton.

July 21, 1909.

Nestling.

Recovered at Westbrook, Cumber-
land Co., Me., by Arthur H.
Norton.

July 27, 1909.

Killed by a cat at night, bird left
the nest July 27.

1271. ROBIN. *Planesticus migratorius migratorius.*

Banded at Portland, Me., by Ora
Willis Knight.

July 29, 1912.

Fledgling just out of the nest.

Recovered at Portland, Me., by
Chas. E. Foss.

August 3, 1912.

Killed by a cat on a lawn 'two
and a half blocks north of spot
where bird was banded.'
O. W. K.

2816. BLUEBIRD. *Sialia sialis sialis.*

Banded at West Allis, Wis., by Dr.
R. M. Strong.

July 5, 1909.

Nestling; 'one of a brood of sev-
eral.' R. M. S.

Recovered at Evansville, Randolph
Co., Ill., by August Schilling.

April 1, 1912.

Killed by a Northern Shrike,
Lanius borealis.

6302. BLUEBIRD. *Sialia sialis sialis.*

Banded at Meriden, Sullivan Co.,
N. H., by Ernest Harold
Baynes.

June 3, 1911.

About two weeks old 'one of a
family of five in an unpainted
wooden box, on the corner of
an old shed.' E. H. B.

Recovered at Berlin Md., by son of
a millhand in the employ of
Charles W. Tingle.

January 20, 1912.

Shot together with others of a
flock of Bluebirds.

(b) The following have resulted from the new lot of bands
issued in the spring of 1912.

5804. GREAT BLACK-BACKED GULL. *Larus marinus.*
Banded at Lake George, Yorkmouth Co., N. S., by Howard H. Cleaves.
 July 23, 1912.
 Fledgling.
- Recovered at Mavillette, Digby Co., N. S., by Frank S. Doucet.*
 December 18, 1912.
 Caught alive 'Bird seemed half tame, due probably to some ailment. Band moved easily up and down the tarsus.' F. D.
5830. GREAT BLACK-BACKED GULL. *Larus marinus.*
Banded at Lake George, Yorkmouth Co., N. S., by Howard H. Cleaves.
 July 26, 1912.
 Fledgling 'a few of these birds (about three dozen were banded) were seen later from my blind. They paid no attention to the bands.' H. H. C.
- Recovered at Cape Negro Is., Shelburne Co., N. S., by Ashley Smith.*
 October 4, 1912.
 Shot by Mr. Smith when gunning.
5832. GREAT BLACK-BACKED GULL. *Larus marinus.*
Banded at Lake George, Yorkmouth Co., N. S., by Howard H. Cleaves.
 July 27, 1912.
 Fledgling.
- Recovered at Prout's Neck, Cumberland Co., Me., by G. Clifford Libby.*
 December 6, 1912.
 Found dead on the beach.
7115. PIPING PLOVER. *Ægialitis meloda.*
Banded at Katama, Martha's Vineyard, Mass., by Howard H. Cleaves.
 July 3, 1912.
 Three days old, one of a family of three.
- Recovered at South Shore of Martha's Vineyard, Mass.*
 August 2, 1912.
 Shot by a boy.
12. RED-WINGED BLACKBIRD. *Agelaius phæniceus phæniceus.*
Banded at Quonochoutaug, Charleston, R. I., by Harry S. Hathaway.
 June 8, 1912.
 Fledgling, 'caught with the hands and when released alighted on a cattail.' H. S. H.
- Recovered at Green Pond, Colleton Co., S. C., by Thomas Grant.*
 November 2, 1912.
 Shot by a 'bird minder.' ('A small Blackbird known as the Red-winged blackbird, in the fall very destructive to rice.' D. J. Chaplin (owner of plantation).)

6261. PHOEBE. *Sayornis phæbe.*

Banded at Meriden, Sullivan Co.,
 N. H., by Ernest Harold
 Baynes.

June 6, 1912.

Adult, nest in old house in Corbin
 Park.

Recovered at Meriden, N. H., by
 Mrs. Ernest Harold Baynes.

July 14, 1912.

Found dead beneath nest; 'could
 assign no cause for death. As
 far as I could see the presence
 of the band had had nothing to
 do with the case. The bird
 had laid one egg of the second
 set.' E. H. B.

EXPLANATION OF PLATES.

PLATE VII.

FIG. 1. Banding young Black-backed Gulls (*Larus marinus*) in the
 Lake George, Nova Scotia, Colony, July 25, 1912. Photograph by G. K.
 Noble.

FIG. 2. Banded young Black-backed Gull, Lake George, Nova Scotia,
 1912.

PLATE VIII.

FIG. 1. Two young Mourning Doves (*Zenaidura macroura carolinensis*)
 banded at Staten Island, N. Y. City, May, 1912. Game birds or others
 shot for food are most likely to produce return records.

FIG. 2. Chimney Swift (*Chætura pelagica*) banded at Meriden, N. H.,
 in June, 1911, and returned, after wintering in the tropics, to his old chimney
 in New Hampshire, June, 1912. Photograph by Ernest Harold Baynes.

FIG. 3. Old Barn Owl (*Aluco pratincola*) and her five young banded at
 Staten Island, N. Y. City, June, 1912. Only one pair of these birds is
 known to nest each year on the island and banding is likely to cast light
 on the problem of dispersal of the young.

ANATOMICAL NOTES ON SOME GENERA OF PASSERINE
BIRDS.

BY HUBERT LYMAN CLARK.

THERE are many genera of Passerine birds, the relationships of which are still more or less uncertain, largely owing to our lack of knowledge of their anatomy. Thanks to the kindness of Mr. Outram Bangs, and his interest in having our knowledge along these lines extended, some alcoholic material has already been placed in my hands and more is promised, which will enable me to study the anatomy of some of these genera of doubtful affinity. Through the kindness of Dr. C. W. Richmond and the authorities of the United States National Museum, to whom I here express my hearty thanks, representatives of the three following genera have been sent me, and I venture to present here the results of my studies. Such studies can only be carried on with profit, where large collections of skins and alcoholic birds are accessible for comparison, and I am therefore indebted to Mr. Henshaw and Mr. Bangs for the freedom with which I have been permitted to use the collections in the Museum of Comparative Zoölogy.

SALTATOR.

An adult male specimen of *Saltator atriceps* Lesson, from Mexico, lacking wing and tail feathers, but otherwise in good condition, preserved in alcohol, has been carefully studied in comparison with *Pipilo* and *Piranga*. The characters of the bill and feet of *Saltator* are too well known to need any comment from me, while the tongue shows no distinctive character. It is so similar to that of *Pipilo* that the only difference is its slightly greater fleshiness.

Pterylosis. The general pterylosis of *Saltator* is like that of most oscinine birds and reveals no really distinctive feature. The upper cervical tract is long and narrow, only three feathers wide for most of its length, but the dorsal tract has the usual rhomboidal form. Other specimens show that the wing is pointed by the sixth primary, which is nearly equalled by the fifth and

seventh; the fourth is longer than the eighth which is about equal to the third; the second is longer than the ninth which may be either longer or shorter than the first. This arrangement of the primaries is quite different from that shown by *Piranga* but is almost exactly like that found in *Pipilo erythrophthalmus*. The tail is very much graduated and is made up of 12 soft, broad rectrices.

Alimentary Canal. No notable characters are shown by the intestine or stomach, which are not distinguishable from those of *Pipilo*. The intestine measures about 225 mm. in length, or rather less than the total length of the bird, but one and a half times the length of the bird, if the rectrices are not included. The stomach contained seeds and the pit of a small, cherry-like fruit, as well as much undetermined vegetable matter; no insects were noted.

Palatine Region. The palatine processes are long and conspicuous as in the finches and tanagers generally. There is a well-developed "secondary palatine process" on each side much as in *Habia*, although not so long or conspicuous as in that genus. They are rather better developed than in *Piranga*. The maxillo-palatines are not peculiar.

Sternum. There is no trace of an 'osseous bridge' from the anterior margin of the sternum to the manubrium, such as occurs in *Piranga* and *Rhodinocichla*. Back of the anterior margin which is vertically very much thickened there is a bony roof over the small space contained between the anterior margin and the sloping sides of the sternal floor. This bony roof is present in many finches and tanagers but shows great diversity in its extent and appearance. In *Saltator*, it is perforated by a conspicuous, circular, median foramen, posterior to which is a second much smaller opening. There are no openings in this bony roof in *Pipilo* but in *Habia*, there are two as in *Saltator* although they are very much smaller than in that species. In *Piranga*, there are, in the male, two very large foramina side by side and a smaller opening may be seen in the posterior face of the anterior margin; in the female, the large foramina seem to be wanting. Whether this bony roof and these foramina have any special significance I am not prepared to say, but their appearance in *Piranga* (male), *Habia* and *Saltator* is striking.

Conclusions. The resemblance of *Saltator* to *Pipilo* in its ana-

tomical features is striking, while in two details (secondary palatine process and foramen in osseous roof above sternum) in which it differs from that genus it resembles *Habia*. It lacks the 'osseous bridge' of the sternal manubrium so marked in *Piranga* and *Rhodinocichla*. It seems to me therefore that Ridgway is right in placing *Saltator* in the *Fringillidæ*.

CHLOROPHONIA.

An adult male of *Chlorophonia callophrys* (Cabanis) from Costa Rica has been at my disposal. It has been compared chiefly with *Piranga* and *Euphonia*. Unfortunately alcoholic specimens of other *Tanagridæ* have not been available, excepting *Rhodinocichla*. The characters of the bill and tongue need no comments from me but the tarsi show a certain character which does not seem to have been noted hitherto.

Tarsus. Examination of the alcoholic specimen revealed the interesting fact that the tarsi are distinctly booted. The three scales which usually cover the front of the tarsus in tanagers are fused together so that there is hardly a trace of the lines of division. On noting this fact, I examined a large number of skins of *Chlorophonia* (5 species), *Pyrrhuphonia*, and *Euphonia* (10 species) and several genera of more typical tanagers, with the result, which was surprising to me, that a booted tarsus, as perfect as that of a thrush, is by no means rare among these tanagrine birds. I find it occurs in *Pyrrhuphonia* constantly in both sexes and may well be considered one of the generic characters. It is also fairly constant in *Chlorophonia callophrys*, *longipennis*, *viridis*, *frontalis psittacina*, and *occipitalis* but is less frequent in typical *frontalis* and in *pretri*. In all these cases adult males generally have the tarsus booted, but in the females as a rule, and in the young the divisions between the scutes are still to be seen. In *Euphonia affinis*, both sexes are, as a rule, booted but in most species of the genus, the scutes on the front of the tarsus are quite distinct. Booted tarsi are also found, at least in adult males of *Calospiza*, *Pœcilothraupis*, *Hemithraupis*, *Chlorospingus* and *Mitrospingus*. Very probably they will be found in other genera and their occurrence throughout the *Tanagridæ* deserves detailed investigation.

Pterylosis. The general pterylosis of *Chlorophonia* deserves comment because of the noticeable width of the tracts and the density of their feathering. This is particularly true of the upper cervical tract. The dorsal tract ('saddle') is not as broadly rhombic as in most oscines but the outer angles are rounded. The posterior end of the 'saddle' is almost completely separated from the remainder of the dorsal tract, which is at first narrow and with few feathers but becomes broad and well-feathered at the oil-gland. The sternal tracts are abruptly contracted where they pass into the ventrals. There are nine primaries and nine secondaries in the wing; the sixth, seventh and eighth primaries are nearly equal, the seventh a trifle the longest perhaps; the ninth is next, with the fifth, fourth, third, second and first in regular succession. There are twelve rectrices of approximately equal length, though the outer ones are of course (since the tail is nearly square-cut) really the longest.

Alimentary Canal. The stomach is small but quite distinct. One can distinguish a proventriculus about six mm. long and a gizzard of about the same length. The latter has thin walls but the inner surface is hard and corrugated, so there is no reason for refusing to call it a gizzard. Forbes states (P. Z. S. London, 1880, p. 145) that in *Chlorophonia viridis* there is "the same non-development of a gizzard" as in *Euphonia*. It is curious that there should be a noticeable difference on this point within the limits of a single genus, but certainly in *Chlorophonia callophrys* the gizzard is far better developed than in *Euphonia*. The intestine in *Chlorophonia* is extraordinarily long; in the specimen before me it measures 340 mm. or more than $2\frac{1}{2}$ times the total length of the bird. Naturally in its arrangement within the body cavity we find two more folds than is usual among tanagers. The stomach contains seeds and indeterminable vegetable matter and remains of at least one insect.

Palatine Region. The bony palate is remarkable for the very short palatine processes. They are as short and blunt or rounded as in many *Mniotiltidæ*, so that the palate is not at all tanagrine in appearance. There is no secondary palatine process and the maxillo-palatine bones show no peculiarities. The vomer is noticeably broad and thick, with the anterior margin not deeply notched.

Sternum. There is no trace of the osseous bridge nor of foramina

in the bony roof of the space back of the anterior margin of the sternum. In all particulars, the sternum appears to be typically fringilline.

Conclusions. The details of anatomy here given throw very little light on the affinities of Chlorophonia but there is no special relationship to the tanagers shown. The palatine structure and the peculiarities of the alimentary canal both tend to separate it from that group.

EUPHONIA.

An adult male of *Euphonia minuta* from Costa Rica has been available for study and comparisons have been made chiefly with Chlorophonia. The bill and feet need no discussion here; the character of the tarsal covering in Euphonia has been described above under Chlorophonia.

Tongue. The tongue of Euphonia is strikingly different from that of Chlorophonia or any of the tanagrine birds I have examined and resembles that of some of the Cœrebidæ. It is almost tubular, the sides being rolled inward but not quite meeting. The tip is brushy.

Pterylosis. The general plan of the pterylosis is not peculiar. The dorsal saddle is more nearly rhombic than in Chlorophonia and the other tracts are not so broad nor so densely feathered as in that genus. The arrangement of the nine primaries is essentially the same, but the eighth is slightly the longest and the ninth is a trifle longer than the sixth. There are twelve nearly equal rectrices.

Alimentary Canal. The genus Euphonia has long been noted for the apparent absence of a stomach. The specimen at hand does not seem to differ essentially from the one figured by Forbes (l. c.). The intestine is very long, about 180 mm., or twice the total length of the bird, and is much convoluted, as in Chlorophonia.

Palatine Region. The palate of Euphonia has been figured by Parker (Trans. Zool. Soc. London, vol. 10, pl. 46, fig. 3) and the specimen before me agrees well with that figure except for the apparent absence of maxillo-palatines. Parker indicates these bones rather indefinitely and I have found nothing that seems to

me to correspond with them. The palatine processes are remarkably long and pointed, a very characteristic feature of the skull and strikingly different from the condition found in *Chlorophonia*. The vomer is deeply divided anteriorly as Parker has shown and thus is quite different from that of *Chlorophonia*.

Sternum. The sternum shows none of the tanagrine peculiarities of *Piranga* but is almost exactly similar to that of *Chlorophonia*.

Conclusions. The differences between *Euphonia* and *Chlorophonia* in the tongue and palate are so marked as to make one hesitate before asserting that the two genera are nearly allied. Differences in the alimentary canal and in the feet also, may not be ignored. In all of these features *Euphonia* approaches some of the *Cœrebidæ* and the possibility of its relationship to some members of that family should not be ignored. It is however possible that *Euphonia minuta* is not representative of the genus and that some other species may show more tanagrine affinities.

GENERAL NOTES.

Holbøll's Grebe in Concord, Mass.— On December 15, 1912, Bate-man's Pond froze over with black ice, but a thaw and rain resulted on the 17th in covering the ice with nearly an inch of water. During the moon-light night that followed a Holbøll's Grebe (*Colymbus holbølli*) attempted to light in the pond and I believe settling on the ice and was unable again to take wing. On the following morning, it having turned cold during the night, the bird was found with its breast feathers frozen in the ice. The wrists of its wings were badly lacerated by beating against the ice to free itself, but in other respects the bird was uninjured. After much piteous squawking, its feathers were cut from the ice and the bird liberated. Its wings, however, were injured so badly that it was killed and is now preserved in this Museum.— R. HEBER HOWE, Jr., *Thoreau Museum, Concord, Mass.*

Additional Notes on the Harlequin Duck in Wyoming.— In 'The Auk' for⁹ January, 1913, pp. 106-107, I recorded two male specimens of the Harlequin Duck which I saw at Teton Lodge (Moran Post Office), in Jackson Hole last September, and which were supposed to have been

killed in May, 1908. Efforts were made at the time to obtain further details in regard to the capture of the specimens but without success. Since the appearance of the note a letter has been received from Mr. B. D. Sheffield, of Moran, Wyoming, the owner of the birds, who states that they were killed on April 20, 1907. He adds that there were but two of these ducks which appeared during the latter part of March and were seen every day as they stayed on Snake River in front of the Lodge just below the outlet of Jackson Lake. He has never seen any since. In view of the rarity of the Harlequin Duck in this part of its range, it seems desirable to correct the supposed date and to place on record the exact date of capture—T. S. PALMER, *Washington, D. C.*

White Ibis (*Guara alba*) in Missouri.—On July 10, 1910, two White Ibises were killed at Old Monroe, Mo., a town in Lincoln County, fifty-two miles north of St. Louis, by a well known St. Louis banker. The two birds taken were in adult plumage out of a flock of about one hundred. The birds were mounted by Mr. J. Kirk Keller, a St. Louis taxidermist, and one of the specimens now adorns the "Old Monroe Club."

This I believe is the first record of the White Ibis in Missouri. Mr. Otto Widmann, in his book 'A Preliminary Catalog of the Birds of Missouri,' states that two specimens in immature plumage were killed near Quincy, Ill., but gives no instance of the bird being identified in Missouri.—H. C. WILLIAMS, *St. Louis, Mo.*

Glossy Ibis (*Plegadis autumnalis*) in Eastern Cuba; a New Record.—On January 25, 1913, I took an adult male of *Plegadis autumnalis* (Linn.) in winter plumage in the lagoon at 'Manati' on Guantanamo Bay, Oriente Province, Cuba. There were a pair of this Ibis feeding together with Little Blue, Louisiana, and Great Blue Herons, on small fish, in a nearly dry puddle of the lagoon.

This is the first record for Eastern Cuba for this species; the only other records for Cuba are those of Dr. Gundlach from 'La Cienaga de Zapata' and a lagoon (unnamed) near Cardenas, in Matanzas Province.

I had seen a specimen some five years ago flying over the bay near 'Manati,' but was unable to secure it; since then none have been seen till this year.—CHAS. T. RAMSDEN, *Guantanamo, Cuba.*

Bittern Breeding in New Jersey.—To the few breeding records of the Bittern (*Botaurus lentiginosus*) in New Jersey, I desire to add two more. A set of four far incubated eggs is now in my collection, taken near the coast in Atlantic County on June 11, 1911, and on June 29, 1912, I examined a nest of this bird containing four full fledged young. It was placed flat on the ground, poorly concealed and was built of a mass of reeds and sedges.—RICHARD C. HARLOW, *State College, Penna.*

Nesting of the Black Rail (*Circus jamaicensis*) in New Jersey.—

The Black Rail has been recorded as nesting in southern New Jersey in 1810, 1877 and 1886, and judging from these data and the secretive habits of the bird, it always seemed to me probable that it bred regularly in suitable localities where original conditions had not been altered. Inquiries among friends who do considerable gunning along the coast between Cape May and Asbury Park brought forth the fact that at least two of them had shot Black Rail in the fall, and one told me that he had seen young birds at rare intervals on the salt meadows.

I requested him to make a special search for the bird during the breeding season of 1912, and on June 22 I was rewarded with a letter, announcing the discovery of a nest containing seven eggs on the edge of the marshes back of Brigantine, which he had collected for me on June 20. On the 29th I visited the nest from which the set had been taken. It was built in a low marshy meadow, overgrown with salt grass and sedge and very skilfully concealed in a thick mass of mixed green and dead grass, so that it was completely hidden from above. In composition, it was better built and deeper cupped than the nests of the Virginia, Sora, King and Clapper Rails that I have seen. In size the nest was little larger than the average structure of the Robin, but deeper-cupped and built entirely of the dry, yellowish stalks of the sedges, and there in the lining, clung several black feathers. Thinking that there might be other nests in the vicinity we began searching every thick clump of marsh grass that we saw, and presently came upon another also containing seven eggs. It was placed among thick clumps of marsh grass and was quite invisible until the grass was parted from above. It was an inch above the salt meadow and was interwoven on all sides with the surrounding stalks. We tried hard to flush the birds but without success, although I once heard a prolonged call or succession of short quick notes, 'kie, kie, kie, kie, kie.' The first set of eggs was partly incubated while the second was fresh. It is possible both were laid by the same pair of birds. The eggs show great similarity and in each set one is peculiar being discolored with a yellowish stain. This points to their being laid by the same bird but the short space of time, nine days, seems too short a period for the building of a new nest and the laying of seven eggs.

The ground color of the eggs is creamy white, well sprinkled with fine dots of reddish brown and a few larger spots. The speckling is nearly like that seen in certain types of eggs of the Meadowlark, but the ground color is entirely different. In size they are noticeably smaller and less pointed than any of our other Rails' eggs, averaging 1.02 by .78 ins.—RICHARD C. HARLOW, *State College, Penna.*

A Recent Capture of the Eskimo Curlew.— I wish to place on record the capture of an Eskimo Curlew (*Numenius borealis*), taken at Fox Lake, Dodge county, Wisconsin, ten miles northwest of my home, on September 10, 1912. Sex, male, adult, fat and in good plumage. Number 7660, collection of W. E. Snyder.

I was away from home for the day, following a threshing crew. The day had been a hot one, and returning to my home about 9 o'clock my wife greeted me thus: "I've got a rare bird for you now I know." Unwrapping the bird the reader can imagine my feelings when I saw the prize. It had been left for me by a party who has repeatedly refused to give me any information as to who shot it, fearing to do so because it had been killed out of season — nor can I learn anything as to whether the bird was alone, flying over decoys, on lake shore, or anything further than that it was shot at Fox Lake. Being about worn out by the hard and hot day's work I could not muster enough courage to mount the bird, so hurriedly I skinned it and that night drove to town and left the skin, duly packed for shipment, with a friend, with orders to mail it on the early morning train, to my friend, the skilled Chicago taxidermist, Mr. Karl W. Kahmann, who has done an artist's job on the bird.

I have carefully compared the bird with descriptions of the species as given in the works of Coues, Ridgway and many other ornithologists. The culmen measures 2.50 inches, wing 9 inches, tarsus 2.62, neck and breast marked evenly and densely with dusky streaks, primaries uniform dusky.— W. E. SNYDER, *Beaver Dam, Wis.*

Hudsonian Curlew on Long Island in Winter.— On the evening of December 24, 1912, during a heavy snow and wind storm, a Hudsonian Curlew (*Numenius hudsonicus*) was found in an exhausted condition in the backyard of an apartment house at Rockaway Beach, Long Island. After spending the night in a basket it recovered sufficiently to fly away at seven-thirty o'clock the following morning. The owner of the house who discovered the bird would not allow it to be taken but it was identified beyond question.

I have not been able to find any previous record of the occurrence of *Numenius hudsonicus* at this time of the year on Long Island.— CHARLOTTE BOGARDUS, *Coxsackie, New York.*

A Peculiar Hudsonian Curlew.— I had supposed that a Curlew with a bill less than 3 inches in length might safely be put down as an Eskimo, but it seems that this is not the case. A bird was shot at Northeast Harbor, Me., September 5, 1912, by Mr. Lynford Biddle of Philadelphia, which was supposed by several persons who saw it in the taxidermist's shop to be an Eskimo Curlew. Upon writing to Mr. Biddle for information he very kindly presented the specimen to the Academy of Natural Sciences of Philadelphia. It proved, as he himself had determined it, to be a Hudsonian Curlew (*Numenius hudsonicus*) but with the bill, which appeared perfectly normal in other respects, only 2.25 inches in length. This is three quarters of an inch shorter than the minimum given in Ridgway's 'Manual,' and exactly equals the minimum for the Eskimo Curlew. This incident emphasizes the importance of making a careful ex-

amination of supposed Eskimo Curlews and not depending too much upon bill measurements.—WITMER STONE, *Academy of Natural Sciences, Philadelphia.*

Hudsonian Godwit on the Magdalen Islands.—The Hudsonian Godwit (*Limosa hæmastica*) is becoming so rare that every occurrence is worth publishing, particularly as it seems to be following the Eskimo Curlew into oblivion.

On the 18th of February, 1911, a hunter got after a flock of six birds, presumably all of the same species, and of these he secured four. Three of these were eaten but the fourth was mailed to me by my friend Mr. J. B. Boutillier with the above information. It was a new bird to him and was also new to my collection.

The specimen is now No. 2570 in my cabinet.—W. E. SAUNDERS, *London, Ont.*

The Golden Plover (*Charadrius dominicus dominicus*) Again on the Coast of South Carolina.—In 'The Auk,' Vol. XXIX, 1912, p. 101, I recorded a specimen of this bird taken by me on November 4, 1911. I now wish to announce the capture by the writer of two birds taken on November 27, 1912, on Oakland plantation, Christ Church Parish.

According to Prof. Wells W. Cooke (Distribution and Migration of North American Shore Birds, Bull. No. 35, Biological Survey, 1910) this date of capture is the latest for the United States. Since I obtained the first specimen in December, 1880 (Birds of South Carolina, 1910, p. 59) only four more have been seen, three of which I secured.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

On the Occurrence of *Columba squamosa* (Bonnaterre) in Cuba.—During the first days of December, 1912, I was advised by a native that there was good 'Torcaza' shooting on the 'Sierra del Maquey' Range five miles to the east of the 'San Carlos' Sugar Estate near Guantanamo. I was unable to get away till the 10th, by which time the natives had had a good ten days' start, having shot probably an average of 300 pigeons a day. Still I found plenty of pigeons, *Columba squamosa* (Bonn.), and got 69 specimens in a few hours, unfortunately very few were worth keeping as great quantities of feathers were knocked off by the branches while falling. In fact only one specimen turned out really good. The pigeons, were feeding on the berries of 'Come-Cara' and 'Juan Perez'. By keeping still I could hear the berries dropping through the leaves to the ground when they slipped from the pigeon's bill, as also their soft, low 'cooing,' thus indicating where to find them.

During their stay on the 'Sierra del Maquey' — some three weeks — I can safely say that over 5000 pigeons were shot by natives for eating and selling. The custom is to cut out the breasts, fry them slightly and put them away packed in lard in earthenware vessels when they will 'keep'

indefinitely, or if the cash is needed, as it often is, the pigeons are strung through the nostrils with wire to be peddled about the streets, this latter was done last December to such a degree that the butchers of Guantanamo complained that the consumption of beef decreased.

This pigeon has the habit of moving about the country in search of food, which when once found they will not abandon for any amount of shooting so long as the supply of food lasts. During May of each year they congregate in huge numbers at certain places on the coast, where they nest on the Mangroves in colonies known as 'Pueblos'; and where unfortunately they are shot by the thousand, very often before the young are able to take care of themselves, and therefore must perish. Fortunately some of their nesting colonies are in inaccessible swamps, where they are safe, for the present at least.—CHAS. T. RAMSDEN, *Guantanamo, Cuba*.

The Marsh Hawk Nesting in New Jersey.— During the past twenty years, the impression seems to have steadily increased that the Marsh Hawk (*Circus hudsonius*) is a rare breeder in the state of New Jersey. This is not in accordance with my experience. It is true, that not many nests have been found, but during a number of trips taken to various points in Cape May, Atlantic, Burlington and Ocean Counties during the last five years I have always noted this bird as present during the breeding season. It is never as common in one place as such birds as the Fish Crow or Green Heron, but not many hawks are. On the 29th of June, 1912, I examined a Marsh Hawk's nest with five young and saw another pair of birds undoubtedly nesting, not far from Atlantic City.—RICHARD C. HARLOW, *State College, Penna.*

The Sharp-shinned Hawk again in Maine in Winter.— I saw a Sharp-shinned Hawk (*Accipiter velox*), apparently a male, circling at a height of about seventy-five yards over upper Spring Street, Portland, on the morning of January 27, 1913. The bird has thus been five times recorded¹ as a winter visitor in Maine after relatively little observation.—NATHAN CLIFFORD BROWN, *Portland, Maine*.

First Michigan Specimen of the Three-toed Woodpecker.— While enroute to the northern peninsula on the Shires Expedition to the Whitefish Point Region, Michigan, the writer examined a collection of mounted birds in the high school at Sault Ste. Marie. In this collection there is a specimen of *Picoides americanus americanus* labeled "Soo, October 1, 1910; C. E. Richmond, collector. Although Mr. Richmond has not been located, Mr. M. J. Walsh, Superintendent of Schools, Sault Ste. Marie, states that Mr. Richmond was at that time instructor in biology in the high school, and that there can be no reasonable doubt of the correctness of the locality record.

¹ Auk, XXVIII, p. 265.

This is apparently the only Michigan specimen of this species that has been preserved. It should be pointed out that at Sault Ste. Marie the northern peninsula is only separated from Canada by the width of the Saint Mary's River, so that northern forms may enter our limits most easily at this place.—NORMAN A. WOOD, *Museum of Natural History, University of Michigan.*

Arkansas Kingbird (*Tyrannus verticalis*) in Delaware.—On December 31, 1912, while on a collecting trip with Mr. Charles J. Pennock at Rehoboth, Delaware, we fell in with four individuals of this species, two of which were secured. The birds were apparently engaged in catching some kind of small insect near the ground over an old corn field, darting down from the tops of the stripped stalks and returning to the same perch in the regular Kingbird manner. They were rather wild and difficult to approach. On examination the stomach was found to contain numerous fragments of some small beetle-like insect. The specimens secured were an immature male and female. The occurrence of this species so far to the east of its normal range is further attested by the specimen captured by Mr. F. H. Kennard on October 20, 1912, at Monomoy Island, Chatham, Mass., "just off the heel of Cape Cod" (*The Auk*, Vol. XXX, Jan. 1913, p. 112). All of these individuals were thus close to the sea, our birds being just back of the beach, with a strip of salt marsh and narrow tangle of green-brier intervening.

It seems reasonable to believe that these were all birds that had bred or been raised in the northern portion of the species' range, possibly somewhere in the Saskatchewan region, and that they went adrift in some westerly gale far to the southeast of their regular track at the outset of the fall migration, reaching the coast of New England and moving to the southward along the shore, lingering, without doubt, on the prairie-like stretches of the Coastal Plain in Long Island and New Jersey.—SPENCER TROTTER, *Swarthmore College, Penna.*

The Wood Pewee as a Foster Parent.—The past season a pair of Kingbirds reared a brood of young in a burr oak standing near my parlor window. In my yard all summer long a lone Wood Pewee took up its headquarters. This latter bird, so far as I could learn, was not breeding—at least there was no nest within a half mile of the house. Early in July we had a severe wind and electrical storm. A few days later I failed to find the parent Kingbirds, though three young, just from nest were about the yard, very noisy all the while. On July 20, when within 100 feet of them, I saw a lone Wood Pewee feeding these young Kingbirds—and was an interested spectator of the act for a full half hour—and the same thing was observed daily for about ten days, when the Kingbirds left for other quarters.—W. E. SNYDER, *Beaver Dam, Wis.*

Two Flycatchers of the Genus Empidonax New to the Fauna of South Carolina.—Since my 'Birds of South Carolina' was published in

1910, I have identified two Flycatcher's near Mount Pleasant which I wish to place on record. On October 8, 1912, a young female Yellow-bellied Flycatcher (*Empidonax flaviventris*) was taken in a large deciduous swamp, which is the first specimen I have ever seen or taken during the past 30 years of almost uninterrupted observations. When first seen I, of course, supposed the bird to be an example of the Green-crested Flycatcher (*E. virescens*) and, as it was 16 days later than I had ever detected the latter species, I concluded to obtain it. Upon securing the specimen I realized at once that I had a prize and thoroughly explored the entire swamp with the hope of finding others. But in this quest I was disappointed, as no Flycatcher of this genus was seen after that date.

In 'Birds of South Carolina' I listed the Alder Flycatcher (*E. t. alnorum*) as the form which occurs here in late summer and autumn. Upon looking over some of these Flycatcher's, which I had packed away ever since 1900, I came across a very brownish bird that I secured on September 14, 1900. In comparing it with an example of *E. trailli trailli* from British Columbia, kindly loaned to me by Dr. Louis B. Bishop, I found no difference between them, while all the other specimens I have are apparently true *alnorum* for they agree with birds from North Dakota sent to me by Dr. Bishop.

This specimen of *Empidonax trailli trailli* evidently migrated from Ohio or Illinois.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

A Baltimore Oriole in Winter.—On January 15, 1913, I observed a male Baltimore Oriole (*Icterus galbula*) in first year plumage, at the home of H. D. Rymer, a farmer living near Columbiana, Ohio.

The Oriole first appeared a few days before Christmas and has been feeding there regularly ever since. While I was observing him, he went from the suet to an orchard where he was eating apples that remained on the trees. Mr. Rymer informs me that when he first appeared his feathers were ruffled, and he did not seem to be in nearly as good condition as at the present time. I am inclined to think the bird was disabled at migration time and could not leave for its usual winter home with the other migrants. I judge this from the fact that the left wing appeared to be about an inch lower than the right when the bird was perching with the wings folded to his body.—GEO. L. FORDYCE, *Youngstown, Ohio.*

Starlings and Turkey Vultures Migrating.—On January 3, 1912, the weather became bitter cold—following an open winter to that date, and January 4 found a flock of Starlings in Warwick Co., Va., January 6, there was a heavy snow for this section, and on the 8th a large flock was seen again in Warwick Co., while birds were killed by local gunners in Elizabeth City and Norfolk Counties. Cold weather continued until January 24 when a bright warm day induced a big flight of Turkey Vultures to recross James River at a point opposite my house—their numbers being in the hundreds. The night of March 5 it snowed again, and on the 6th a small

flock of Starlings was noticed. From that time until the present writing I have seen no Starlings in this section. During the cold spell they were also taken near Richmond, Va.—HAROLD H. BAILEY, *Newport News, Virginia*.

The Evening Grosbeak in Wisconsin.—On October 21, 1912, my mother, entering her poultry yard to feed her flock, found an adult female Evening Grosbeak (*Hesperiphona vespertina vespertina*) lying dead on the ground. On skinning the bird for my collection I found it to be in good condition of flesh, with a few moult feathers on head and neck, but could find no trace of any injury sustained, nor discover any clew whatever as to the cause of its death. I had previously seen none others here this season, and at the present date, December 16, it is my only record for 1912.—W. E. SNYDER, *Beaver Dam, Wis.*

The Snow Bunting (*Plectrophenax nivalis nivalis*) in Chicago and Vicinity during the Fall and Winter of 1912.—On account of the irregular occurrence of this bird so far south, the following records, showing its status in Chicago and vicinity, as I have observed it during the fall and winter of 1912, may be of interest. It is the more interesting because 'Bird-Lore's' Christmas census for 1912 (Bird-Lore 15:20-45. 1913) seems to indicate an absence of boreal species in the Middle States, the Snow Bunting not being recorded outside of Canada, except in the eastern states of Vermont, Massachusetts and New York.

October 23 one was seen about the beach at Jackson Park. This bird arrived three days earlier than any previously reported from this region (W. W. Cooke, 'The Migration of North American Sparrows.' Bird-Lore 15:17. 1913). October 24 there were two in the same locality. November 2 twelve were seen feeding on grass seed on the beach at Lincoln Park. November 30 two were seen flying along the beach at Miller, Indiana. December 20, ten were seen about the rocks forming the breakwater where land was being filled in at Lincoln Park. Frequent excursions after December 20 failed to reveal any more of the birds, and they probably migrated still farther south.

All the birds observed were tame, allowing a close approach, thus making their identification a very easy matter.—EDWIN D. HULL, *Chicago, Illinois*.

A Strange Sparrow Roost.—Early in the fall of 1912 the European Sparrows in the City of Utica, N. Y., established a roost in the tops of the elms in the yard of a church in the most busy part of the City. At dusk every evening they assembled to the number of several hundred to spend the night in these unprotected trees. Early in January, Mr. James O. Roberts, a young observer called my attention to the fact that there were some strange birds among the sparrows, and after some difficulty in identification it was discovered that they consisted of a Starling (*Sturnus*

vulgaris) — a new record for central New York — and a number of Cow-birds (*Molothrus ater ater*); as many as ten being seen at one time. These are strange birds for mid winter in this locality. The winter had been very mild up to this date and there was very little snow at the time.— EGBERT BAGG, *Utica, N. Y.*

Towhee in Winter near Steubenville, Ohio.— While taking an all day walk on December 26 I was surprised to find a flock of from fifteen to twenty Towhees (*Pipilo erythrophthalmus*). There were both males and females in the flock. There were several inches of snow on the ground with the thermometer at about 60° F., and a strong sun. As this is a late date for this species I thought it worth reporting. The birds were seen three or four miles south of this city on the West Virginia shore.— KENYON ROPER, *Steubenville, Ohio.*

Barn Swallow in South Carolina in Winter.— The Barn Swallow (*Hirundo erythrogaster*) is an abundant migrant in the coast region of South Carolina, occurring regularly through the middle of October. Mr. Arthur T. Wayne (Birds of South Carolina, p. 139) says, "a belated specimen was observed on Oct. 29, 1906." On Dec. 17, 1912, while passing through the Navy Yard at Charleston, S. C., I had a glimpse of a Swallow which I recognized at once as belonging to this species. Hoping to get a closer view, I waited. The bird soon reappeared and passed low over my head several times, showing distinctly its color and its deeply forked tail. The correctness of the identification is, therefore, beyond question. As the use of firearms is prohibited within the limits of the Navy Yard, I was not prepared to secure the specimen.— FRANCIS M. WESTON, JR., *Charleston, S. C.*

Notes on the Loggerhead Shrike at Barachias, Montgomery Co., Ala.— On Jan. 10, 1912, the men felled a tree in the grove and in sawing it into three foot lengths turned out quite a number of large, white, blue-bellied grubs. Most of these were placed upon one of the 'cuts' but a few were left upon the ground and soon attracted the attention of a Shrike (*Lanius ludovicianus ludovicianus*). I seated myself beside the stump only six feet from the grubs on the ground, but the Shrike came and fearlessly removed them, one by one, paying little attention to my presence, so I decided to try a photograph. Securing my camera I focused it at six feet upon the grubs on one of the 'cuts,' while I sat upon another, but soon I had worked the instrument up within eighteen inches of them and still the Shrike came with very little hesitation and removed the very last one, regardless of the click of the shutter, while I still sat there. The grubs were impaled upon the thorns of several different trees. After hastily snatching one the Shrike nearly always alighted upon some nearby branch to get a firmer grip upon the grub before flying away to impale it.

Jan. 16, 1912, everything was frozen hard and the bright sun did not

seem to relieve matters. I was returning from a visit to a trap in the grove when my attention was attracted by the cries of a bird in the broom sedge near me. Advancing cautiously I discovered a Shrike throttling a Mockingbird which it had pinned down on its back on the ground. I watched until the Mockingbird was killed and then noticed another hovering about with drooping wings, but it made no attempt to drive the Shrike away. I picked up the dead bird then and found that its neck was broken and a large patch of skin missing from its occiput. Evidently it was killed by its neck being broken, which the Shrike accomplished by repeated blows with its hooked beak. I squatted perfectly still and held the dead bird in my right hand, which was gloved, and the Shrike came and endeavored to take it from me, alighting on it and tugging at its head with all its might. Putting the bird down I returned to the house for my camera but when I got back I found the Mockingbird disemboweled and the Shrike nowhere in sight. The entrails were removed through a small hole in the bird's back, about over the kidneys. The measurements of the dead Mockingbird exceeded those given in Coues' 'Key' for the Shrike, although I judge that it was a young one. It is my opinion that the Shrike attacked such a large bird only under stress of hunger, everything being frozen. I am almost sure that this is the same bird I photographed Jan. 10.—
ERNEST G. HOLT, *Baruchias, Ala.*

Wintering of the Blue-headed Vireo (*Lanivireo solitarius solitarius*) at Aiken, South Carolina.— On January 28, 1913, I saw a Blue-headed Vireo (*Lanivireo solitarius solitarius*). The bird was flitting about in the branches of a long-needled pine (*Pinus palustris*) in company with two Brown-headed Nuthatches, two Brown Creepers, and a Golden-crowned Kinglet. The bird was tame, allowing me to approach within a few feet before paying any attention to me.

As this species is not credited with wintering as far north as this point, I consider it a note worth recording.— JOHN DRYDEN KUSER, *Bernardsville, New Jersey.*

The Magnolia Warbler (*Dendroica magnolia*): an Addition to the Fauna of the Coast Region of South Carolina.— On September 29, 1912, I shot on Oakland plantation, Christ Church Parish, a superb young male of this species. There was a tremendous migration that morning and, although Sunday, I thought I would take a short walk and see if there were any *rarae aves* among the thousands of Warbler's which had arrived. When first seen I was satisfied that the bird was a young male Cape May Warbler (*Dendroica tigrina*), as the morning was dark without sunlight, and it was not until I had the bird in my hand that I realized I had made a mistake and had taken a bird that I had never seen before. One shot was fired, but it brought to me a new bird for the coast of South Carolina.

Dr. Eugene Edmund Murphy has taken this species in the autumn at Augusta, Georgia, but he has found it excessively rare there.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Cape May Warbler (*Dendroica tigrina*) Taken in the Spring on the Coast of South Carolina.— Dr. Louis B. Bishop, while paying me a visit in the spring of 1912, shot two Cape May Warblers — a male and a female — on April 23, 1912, and, on the same day and at the same place, I took three of these birds. The Cape May Warbler has not been seen or taken in the spring by the writer in the past thirty years and he is indebted to Dr. Bishop, who took the first specimen, for finding the birds.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Catbird and Brown Thrasher in Winter in Massachusetts.— On Christmas Day, 1911, in the Arnold Arboretum at Jamaica Plain, Massachusetts, I saw a Catbird (*Dumetella carolinensis*) in some shrubbery about three hundred yards from the museum. It was quite lively though silent and rather shy. Twenty days later, on January 14, 1912, I again saw what was probably the same bird. This time it was apparently sunning itself in the vines on the museum. After allowing a rather near approach it flew across the road into some bushes, where it remained still seeking the sunshine and as before, silent. The weather was clear and cold with a minimum temperature of one degree below zero and the Catbird acted, as it well might, as if it was half frozen. The bird was not observed after this date and as shortly afterwards some Catbird feathers were seen strewn around about the museum it probably came to an untimely end.

While walking in the Arboretum on the morning of December 22, 1912, I saw a Brown Thrasher (*Toxostoma rufum*) on the ground very busily at work poking among the leaves with its bill. The bird was very tame and I approached to within four feet of it, hardly any notice being taken of me. It did not utter a note of any kind neither did it leave the ground while I was there. It has not been seen since, the snowstorm of Christmas Eve probably driving it southward.— HAROLD L. BARRETT, *Jamaica Plain, Mass.*

Brown Thrasher Wintering near St. Louis, Mo.— The winter of 1912-13 has been remarkably mild with very little precipitation. The ground has not been completely covered with snow this winter in the brush-covered portions of the bottomlands, and the lowest temperature was four above zero, on February 1.

On Feb. 2, 1913, at Creve Coeur Lake, in a well sheltered area of thick underbrush in the Missouri River bottomlands fourteen miles north of St. Louis, I had the good fortune to observe at close range a Brown Thrasher (*Toxostoma rufum*). It was the day after our coldest weather and a light snow was falling. The bird was scratching in the dead leaves in search of food and from all appearances was in excellent condition. It flew from bush to bush as I pursued it and seemed very much at home in its surroundings. Mr. Widmann gives no record of the bird wintering near St. Louis and gives March 13, 1882, as the earliest date of spring arrival.— H. C. WILLIAMS, *St. Louis, Mo.*

Random Notes from Easton, Pa.—*Ceryle alcyon alcyon*. BELTED KINGFISHER.—I saw a Kingfisher flying along Bushkill Creek calling lustily on January 4, 1911.

***Colaptes auratus luteus*.** NORTHERN FLICKER.—One was seen on February 13, 1909. This is the first and only winter record I have for the species.

***Archilochus colubris*.** RUBY-THROATED HUMMINGBIRD.—A female or a bird of the year was seen in an orchard here on October 3, 1908. The Hummingbird usually leaves more than a week earlier.

***Loxia curvirostra minor*.** CROSSBILL.—On April 13, 1912, I saw two Crossbills in a small maple tree, apparently feeding on the buds. They were quite fearless; so I was able to approach very near to them.

***Spizella pusilla pusilla*.** FIELD SPARROW.—On November 27, 1908, two Field Sparrows were seen in a tangled briar thicket. Another one was observed on January 9, 1909.

***Compothlypis americana usneæ*.** NORTHERN PARULA WARBLER.—In 1907 I saw this warbler on October 17; while in the following year one was seen on October 10. These are late dates.

***Dendroica virens*.** BLACK-THROATED GREEN WARBLER.—An immature bird was seen as late as October 31, 1907.

***Setophaga ruticilla*.** REDSTART.—Either a female or an immature bird was observed along the edge of a woods on October 27, 1909. This species breeds here occasionally. On June 8, 1907, an occupied nest was discovered above twenty feet above the ground in an upright crotch of a vine, pendant on a tree. At the time the female was on the nest.

***Sitta canadensis*.** RED-BREASTED NUTHATCH.—This bird is a very erratic visitant here. During the fall of 1906 it was very abundant from September 25 until October 30, when the last one was noted. In 1907 but one individual was observed. Then the species disappeared from here and for three years none was seen. But on October 11, 1911, a solitary bird was noted; while on October 17 and 18, 1912, several were observed.

***Regulus calendula calendula*.** RUBY-CROWNED KINGLET.—On February 27, 1911, a male Ruby-crowned Kinglet was seen and positively identified. The bird was flitting about in the undergrowth of a woods giving its wren-like call. This is not the first winter record for this locality, for during January and March, 1908, this species was observed several times. (Cassinia, 1908, p. 64.)

***Hylocichla guttata pallasi*.** HERMIT THRUSH.—Again I wish to report the presence of this species here in winter (Auk, Vol. XXIX, p. 250). On December 25, 1912, I saw an individual of the species in the undergrowth of a woods on a sunny hillside. The bird was watched some time and closely observed. Its call, habit of nervously jerking the tail up and down with an accompanying flap of the wings, and the coloration, which was characteristic of the Hermit Thrush, left no doubt as to the true identity of the bird.—EDWARD J. F. MARX, *Easton, Pa.*

A few South Dakota Records of some Western Birds.—A short time ago I went over the bird skins in the museum here and sent a number which promised to be of interest to the Biological Survey for identification by H. C. Oberholser. In a letter recently received from Wells W. Cooke he states that, among others, the following records are extensions of previously established ranges. It is therefore thought that the publication of the known data concerning these records would be desirable. The Grebe was collected by H. E. Lee of Rapid City, the Savannah, Grasshopper and Tree Sparrows by E. H. Sweet of Sturgis and the remaining numbers by the writer.

***Aechmophorus occidentalis*.** WESTERN GREBE.—Hamlin County, northeastern S. D., Nov. 10, 1911, immature. (Mr. Lee states that he has found nests of this species and seen young in all stages upon Lake Norden in that county.)

***Otus asio maxwelliæ*.** ROCKY MOUNTAIN SCREECH OWL.—Oelrichs, Fall River County, southwestern S. D., Aug. 5, 1911. Considered by Cooke to be a notable extension of range.

***Dryobates pubescens homorus*.** BATCHELDER'S WOODPECKER.—Willet, Harding County, northwestern S. D., Sept. 4, 1912.

***Myiochanes richardsoni*.** WESTERN WOOD PEWEE.—Fall River County July 27, 1911, Lawrence County, northern Black Hills, July 25, Harding County, Sept. 4, 1912. (Abundant in the pine forested areas of western S. D.)

***Cyanocephalus cyanocephalus*.** PINYON JAY.—Buffalo Gap, Fall River County, July 24, 1911. (Quite frequent in the coniferous regions especially the Black Hills, Cabe Hills and Pine Ridge.)

***Poœcetes gramineus confinis*.** WESTERN VESPER SPARROW.—Forestburg, Sanborn County, southeast-central S. D. July 15, 1906.

***Passerculus sandwichensis alaudinus*.** WESTERN SAVANNAH SPARROW.—Menno, Hutchinson County, southeast-central S. D., Apr. 28, 1902.

***Ammodramus bairdi*.** BAIRD'S SPARROW.—Harding County, July 12, 1910, Sept. 3, 1912. (Breeds quite abundantly in the extreme northwestern corner of the state.)

***Ammodramus savannarum bimaculatus*.** WESTERN GRASSHOPPER SPARROW.—Menno, Hutchinson County, Aug. 15, 1900.

***Spizella monticola ochracea*.** WESTERN TREE SPARROW.—Hutchinson County, Dec. 27, 1900.

***Spizella passerina arizonæ*.** WESTERN CHIPPING SPARROW.—Oelrichs, Fall River County, Aug. 4, 1911.

***Guiraca cærulea lazula*.** WESTERN BLUE GROSBEEK.—Carter, Tripp County, south-central S. D., Aug. 16, 1911, immature. Breeds frequently in the Pine Ridge country as far east as the 100° of longitude.

***Myadestes townsendi*.** TOWNSEND'S SOLITAIRE.—Minnekahta, Fall River County, July 27, 1911, a fledgling. Breeds regularly and plentifully in all sections of the Black Hills. A straggler noted at Vermilion, extreme southeastern S. D., Jan. 9, 1911, (see 'The Auk', April, 1911, p. 270.)—S. S. VISHER, *State University, Vermilion, S. D.*

Additions to a list of the Birds of Harding County, Northwestern South Dakota, II.— In 'The Auk' for January, 1911, pages 5-16, I gave a partial list of the birds of this county. In 'The Auk' for January, 1912, page 110-111, was a first list (10 species) of additions. During the summer of 1912 I revisited in August and September, practically all parts of the county under the auspices of the South Dakota State Survey and collected a number of birds. Species added to the list at this time are marked by an asterisk.

Ardea herodias. GREAT BLUE HERON.— Though reported by Grinnell and by Catron, I met with no individuals during 1910 or 1911. In 1912, however, several were seen along the Little Missouri River early in September.

Dryobates pubescens homorus. BATCHELDER'S WOODPECKER.— A specimen collected September 4, was identified by Oberholser as belonging to the Rocky Mountain subspecies. In my list the Downy Woodpeckers were reported as *D. p. medianus*.

***Porzana carolina.** SORA.— One individual was seen September 7, in a small reed-filled slump-marsh in the East Short Pines.

Ammodramus bairdi. BAIRD'S SPARROW.— This was an abundant species early in September. Specimens collected at that time as well as the breeding male shot July 14, 1912, have been identified by Oberholser.

Melospiza melodia juddi. DAKOTA SONG SPARROW.— A breeding Song Sparrow collected by me in the sand hills of southern South Dakota (Bennet County) has been referred by Oberholser to this subspecies. Cooke writes as though all the Song Sparrows of western South Dakota must therefore belong to *M. m. juddi* (instead of *M. m. melodia* as I reported in my list.)

***Melospiza lincolni lincolni.** LINCOLN'S SPARROW.— One collected September 7, in the East Short Pine Hills (identified by Biological Survey.)

Representatives of various other species were collected and specimens of a number were submitted to the Biological Survey, but since they merely substantiate earlier field identifications, and require no corrections it is not thought necessary to mention them.—S. S. VISHER, *University of South Dakota, Vermilion, S. Dak.*

Birds at Sea.— On December 8, 1912, a live female Eider Duck (*Somateria dresseri*) was brought to me. It had been captured on the deck of the steamship 'Juniata,' off Cape Cod, Mass., December 5, having come aboard in a dense fog. It lived for ten days on celery tops — all other food refused — at the end of which time it died, and is now in my collection.

On about October 16, 1911, two young Duck Hawks were captured on a tramp steamer coming to this port for bunker coal. The mate informed me they were about one hundred miles off Hatteras when the birds were taken. An Osprey also came aboard the same day, and all were easily captured as they were utterly exhausted. There had been a bad storm the day previous. These birds were examined by both my father and me

and pronounced young of the year. We were unable to purchase them from the sailors.— HAROLD H. BAILEY, *Newport News, Va.*

Two Ornithological Fables from Louisiana.— While in Avoyelles Parish, La., recently, the writer heard two interesting bird stories. One concerns the Wood Ibis (*Mycteria americana*). A man told me: "I have heard from my father, and my grandfather, and have heard all my life, that a flock of these birds will alight in shallow water and set to scratching their heads. After all have been doing this a short time, the fish in the place rise and float on the surface stupefied, thus falling an easy prey to the birds."

Although this tale is a great tax upon credulity the writer gave it the benefit of the doubt to the extent of testing the fundamental assertion scientifically. Some minnows were kept in a small aquarium with a good quantity of scaly scurf from the head and neck of a Wood Ibis. The minnows showed no signs of discomfort (during 24 hours) and in fact ate some of the scales. A friend has suggested that if there is anything at all in the story, the probability is that scales being scratched off might attract small fishes in search of food.

The other fable, admittedly a morality tale,¹ I have put in the following form: It is related that one day of the days a dove espied an ant struggling in the water. Moved to compassion, the dove plucked a leaf and laid it on the water near to the ant. The ant climbing thereon was saved from drowning and a favorable breeze springing up, was wafted to shore and his hold on life made sure. At a later time, the dove sitting quietly on a branch of a tree, was drowsily enjoying the beauty of the day. A wicked boy, gun in hand, stealthily approached, and having taken deliberate aim was about to fire. In this extremity the ant, witnessing the turn of events, quickly climbed to the boy's neck and, ere he could pull trigger bit him shrewdly on the ear. The lad disconcerted by the sharp pain, let fall his gun, and with an exclamation, roughly brushed his hurt. All this hubbub aroused the dove who made off in safety.

Moral: Befriend, and you may be befriended.— W. L. MCATEE, *Washington, D. C.*

¹ This evidently old story appears in a different guise in the ² *Marvels of Ant Life.* W. F. Kirby, 1898.

RECENT LITERATURE.

Scharff's 'Distribution and Origin of Life in America.'¹ — Dr. Scharff's 'Distribution and Origin of Life in America' is of extreme interest and of great value to every student of the profound and fascinating problems discussed, whether or not his conclusions meet with the reader's acceptance. To the investigator it is extremely welcome for its bibliographical citations and summaries of fact and opinion put forth by his predecessors in the same field. To the layman it may be misleading if too great importance is given to the author's interpretations and inferences.

A striking feature is the confidence the author manifests in his conclusions, regardless in many instances of the present inadequacy of our knowledge of the biology and the geological history of the greater part of the areas he discusses, as though our present information regarding these subjects was to be looked upon as practically final. Climatic conditions as barriers to the distribution of life and the former wide distribution of ancestral types from which their present modified representatives have necessarily descended, appear to receive very little consideration. Resemblances through convergence of characters due to environment between groups geographically widely separated are rarely given serious consideration, and a tendency is evident to belittle the influence of tides, currents, and other fortuitous means of dispersion. The fact that what we do not know of the fossil content and the geological history of vast areas of South America and of other parts of the world that require consideration in the author's theme, is simply immense in comparison with the known, is rarely recognized in the present work. Neither does the paucity of our knowledge of the existing plant and animal life of Central and South America appear to have received due recognition. Among the birds and mammals of these great regions, new species, and often new genera, are discovered in every new collection that reaches the hands of the expert, while the range of many forms long known to science is greatly and often most unexpectedly extended whenever a collector trained in modern methods of field work enters tropical America. As it is safe to say that the mammals and birds of South America and Central America are far better known than the representatives of any other class, it seems not rash to claim that our knowledge of obscure and not easily observed forms of invertebrate life is far too imperfect to warrant dogmatism in treating of their origin and

¹ Distribution and Origin of Life in America | By | Robert Francis Scharff | Ph. D., B. Sc. | Author of "European Animals, their Geological History and Geographical Distribution." | Corresponding Member of the Academy of Natural Sciences, Philadelphia; | of the Senckenberg Natural History Society, Frankfurt am Main; | of the Linnean Society of Bordeaux; and of the Anthropological Society of Paris | New York | The Macmillan Company | 1912 — Svo, pp. xvi + 497, 16 map. \$3.00 net.

distribution. Yet the author discusses many such questions with an assurance that only a much greater knowledge of the facts in the case than is at present available would warrant.

It must be said, however, that the author has overlooked but little of the available information bearing upon his subject, and that he has used it effectively in so far as it favors his side of the argument. No one author, however, can in these days bring to all the varied facts and problems of such a broad subject the equipment of an expert, and he is thus prone to give to the literature he cites its full face value; especially when it seems favorable to his hypotheses. Slightly differentiated forms, considered not worthy of nomenclatural recognition by the majority of authorities, are usually cited as full species, and groups proposed as subgenera are commonly cited as full genera, although in various instances they are not currently recognized as having even subgeneric value. In the case of the muskox and his ancestry, he has accepted the baseless conclusions of a recent writer on the subject at the author's own estimate, and thus introduced into his work grave errors that it will now be difficult to eradicate from semi-popular sources of information. In some cases, however, he has overlooked information having an important bearing on points considered, as where in his discussion of the evidences in favor of a mid-Atlantic land bridge between the West Indies and Africa (p. 280 and fig. 14) during the early Tertiary, he cites the seals of the genus *Monachus* as evidence of such a connection, which genus he says occurs only in the Mediterranean and Antillean regions, overlooking the fact that a species (*Monachus schauinslandi* Matschie), very closely related to the other two, has been described from Laysan Island in the mid-Pacific! This, it is true, is a comparatively recent discovery,¹ but serves all the more to show the imperfection of present knowledge of the distribution of important types of even mammalian life.

In his discussion of Antillean life the rice-rats (*Oryzomys*) are said to have a "very wide and discontinuous range in North and South America," suggesting an ancient origin. Few groups of American mammals, it is true, range more widely — from southern United States to Terra del Fuego — nor has any a more continuous or unbroken distribution. This is a small error in comparison with the misstatement that one species (*O. antillarum*), known from only a few specimens, collected some thirty years ago, was formerly "so abundant in Jamaica, and did such damage to crops, that the mongoose, a small carnivore, was imported from India for its destruction," the fact being that the destructive rats of Jamaica and neighboring islands are introduced Old World species of the genus *Mus* (= *Epimys*).

In his discussion of the fauna and flora of Florida, Lower California, and Labrador, the author shows a surprising disregard of the controlling influence of temperature and other climatic conditions upon the range of

¹ Matschie, P. Sitzungsab. Gesell. Nat. Freunde, 1905, pp. 254-262.

plants and animals. In referring to the distribution of Florida plants with West Indian affinities, he says: "If birds had any special influence in the transport of seeds, not the southern portion of Florida but the northern one should show affinities in the flora with the West Indies." In other words, if birds had carried seeds during their migrations to northern Florida, the vegetation of this portion of the state should show affinities with the flora of the West Indies, regardless of climatic barriers that we know would prevent their growth. This is only one of many illustrations that might be cited to show the author's disregard of climatic conditions as a factor in determining on a large scale the present restrictions of range of plant and animal life.

In reference to crocodiles and alligators, which are found in both Asia and America, the author says: "The generally accepted theory, I believe, is that some ancestors of the American alligator has travelled northward, and succeeded in crossing the former land bridge across Bering Strait to northeastern Asia, thence wandering southward to China. We possess no fossil evidence for such a belief. All we know is that the rather generalized alligator *Diplocynodon* lived already at the very commencement of the Tertiary Era both in North America and in Europe, and that it persisted in Europe until Miocene times." Of the crocodile he says: "An equally remarkable fact is that the true crocodile has succeeded in obtaining a footing on the North America continent in one single small area, namely, . . . in southern Florida." Yet he cites the occurrence of their fossil remains in the Eocene of Wyoming, but makes no admission of the possibility of their occurrence in Tertiary times at intermediate points between Wyoming and India, in vast regions now palæontologically very little known, or absolutely unknown. On the contrary, he says "it seems surprising that they have not spread more widely in America." He admits that "only a land connection between America and the Old World in early Tertiary times can explain its [crocodile's] present geographical distribution," but he prefers a land bridge across the north Pacific between western North America and eastern Asia to the commonly accepted Bering Strait bridge.

He contends that ten land bridges are necessary to account for the present distribution of animal life in America. These may be listed as follows:

1. A North Atlantic land bridge between Scotland, Greenland, and Labrador during recent geological times.
2. A North Pacific land bridge at Bering Strait, coincident in time with the North Atlantic bridge.
3. A Mid Atlantic bridge between southern Europe and the West Indies.
4. A Mid Atlantic bridge between Europe and southeastern North America.
5. A South Atlantic bridge between eastern South America and West Africa.
6. A South Atlantic bridge between Patagonia, South Africa, and Madagascar, of which he says: "We can gather from all these expressions of opinion by different authors as to the past geological history of South America that there is comparatively little agreement on this subject."

7. A North Pacific land belt between western North America and eastern Asia.

8. A Pacific land belt between North and South America westward of Central America.

9. An Antarctic bridge between Patagonia, Chile, Australia and New Zealand.

10. An Atlantic bridge between Bermuda and the West Indies, Bermuda being part of a continent that extended northward from the West Indies and joined the mainland of North America somewhere near Massachusetts.

The author takes up his subject geographically in fifteen chapters, beginning with Greenland and passing southward to Argentina and Chile, discussing these in succession from the viewpoint of their biology and geological history, with special consideration of their faunistic affinities. It would therefore have been a great convenience to the reader if he had given a topical résumé of the evidence for the ten land bridges he advocates disconnectedly in the course of the book, summarizing the pros and cons for each in a connected way, defining also their presumed extent and continental connections, and their probable geological age and duration. Former supposed land areas and their connections offer a fascinating topic for speculation, but the evidence at present is so meager and conflicting that the conclusions reached are apt to depend upon the temperamental characteristics of the author.

Dr. Scharff has certainly presented us with a work of unusual interest, and one which will stimulate to further investigation of the problems he has so elaborately discussed.—J. A. A.

Brabourne and Chubb: 'The Birds of South America.'¹—The appearance of the first volume of this monumental work will be welcomed by ornithologists the world over. Even though it be merely a list similar in style to Sharpe's 'Hand-List,'—a framework as it were upon which the main structure is to be built up—it is nevertheless of the greatest assistance to students of the neotropical avifauna, as the writer has already had occasion to prove. It is forty years since Selater and Salvin published their 'Nomenclator Avium Neotropicalium' and we have had no general work on South American birds since. It is moreover a great advance over Sharpe's 'Hand-List' since the references are given in full with type localities and the nomenclature has been made to conform largely with the International Code. Binomials are used, as the authors explain, merely as a matter of convenience, the intention being to work out the relationship of species and subspecies and adopt trinomials in the body of the work.

¹The Birds of South America by Lord Brabourne, F. Z. S., M. B. O. U., and Charles Chubb, F. Z. S., M. B. O. U. (Zoological Department, British Museum). Vol. 1. London: R. H. Porter, 7 Princes Street, Cavendish Square, W. John Wheldon & Co., 38 Great Queen Street, W. C. Taylor & Francis, Red Lion Court, Fleet Street, E. C. [1912] royal 8vo, pp. i-xix + 1-504 with colored map.

No less than 4561 forms are given in the list, one thousand more than are contained in the Selater and Salvin list and that included Mexico, Central America and the Galapagos all of which are omitted in the work before us. Each species is accompanied by an English name which will be of great assistance to the museum curator in preparing exhibition labels. Some of these names however are unduly cumbersome while others conflict with the names of common North American birds as the use of 'Pewee' for the species of *Empidonax*, of 'Marsh Wren' for *Thryophilus*, etc., we fully appreciate, however, the difficulty of finding English names for over four thousand birds.

One matter of detail, which will of course be corrected in the synonymy, is the failure to quote the name as originally published, so that one cannot ascertain under what generic name a species was described until the reference is consulted. There are also occasional lapses in stating the distributions, for having recently been working over a Venezuelan collection, we note a number of instances where this country is omitted in the ranges of species which are well known to occur there. These are however trifling matters, which should not be seriously charged against a list admittedly only preliminary and which is so excellent and helpful in other respects.

We note a number of changes in names. Some of those which affect North American species are *Columbina* for *Chamepelia*, *Podiceps* for *Colymbus*, *Catharacta* for *Megalestris*, *Pluvialis* for *Charadrius*, *Charadrius* for *Aegialitis* + *Oxyechus* + *Ochthodromus*, *Tringa* for *Helodromas*, *Canutus* for *Tringa*, *Nyroca* for *Marila*, *Oxyura* for *Erismatura*, *Merganser* for *Mergus*, and *Caprimulgus* for *Antrostomus*. *Falco* is divided, *Cerchneis* being used for the Sparrow Hawks; while *Pisobia* is split into *Pisobia* and *Heteropygia*. We note also the use of *Sula dactylatra* Lesson 1837 in place of *S. cyanops*, and *Egretta thula* Molina 1782 for the Snowy Heron, while the Black Vulture, at least so far as South America is concerned, stands as *Catharista fætans*. Some of these changes are undoubtedly necessary but in other cases we think the A. O. U. Check-List is correct.

Ornithologists everywhere will look forward with interest to the succeeding parts of this long needed work.—W. S.

Oberholser's 'A Revision of the Forms of the Great Blue Heron.'¹

—In this carefully prepared monograph, Mr. Oberholser treats the Great Blue Heron as he has previously discussed the Green Heron. Plumages are described in detail and there are numerous tables of measurements and lists of localities from which specimens have been examined.

The races recognized are as follows with approximate breeding ranges: *A. herodias herodias*, eastern North America exclusive of Lower Austral zone; *A. h. wardi*, southeastern U. S., mainly Lower Austral zone; *A. h. adoza* subsp. nov., Bahamas and West Indies; *A. h. treganzai*, western U. S.

¹ A Revision of the Forms of the Great Blue Heron. *Ardea herodias* Linnæus. Proc. U. S. Nat. Mus., Vol. 43, pp. 531-559. December 12, 1912.

north to the Transition zone, east of the coast district; *A. h. sanctiluceae*, southern Lower California; *A. h. cognata* Galapagos Islands, *A. h. hyperonca* subsp. nov., Pacific coast region of U. S.; *A. h. oligista* subsp. nov., Santa Barbara Islands, California; *A. h. fannini*, Pacific coast of north-western North America; *A. h. lessonii*, Mexico to northern South America.—W. S.

Torrey's 'Field-Days in California.'¹—Our pleasure in turning the pages of this last volume of Bradford Torrey is mingled with sadness at the thought that the pen, which for so many years depicted for us the ever-changing face of nature, is forever stilled.

This little book treats of the experiences of the last few years of his life, which were spent in California; and it is particularly interesting to those bird-lovers who are familiar only with the Atlantic slope as it depicts so vividly the easterner's impressions of the birds of 'the coast.'

There is a frontispiece portrait of the author and eight plates illustrating localities treated in the book, in two of which Mr. Torrey himself appears. The Chapter headings are, A California Beach; In the Estero; An Exciting Forenoon; A Long Procession; A Visitation of Swans; My First Condor; My First Water-Ouzels; An Unsuccessful Hunt; Yellow-billed Magpies; Some Rock-haunting Birds; Under the Redwoods; In the Santa Cruz Mountains; Reading a Check-List; On Foot in the Yosemite; A Bird-Gazer at the Grand Cañon.

The Chapter on the A. O. U. Check-List will be read with much interest and the Committee we feel sure will be gratified with Mr. Torrey's opinion of this volume, that 'there's plenty of good reading in the Check-List,' while they will be surprised to see what inspiration he derives from its pages.

'Field Days in California' will take its place as the fitting completion of a series of nature studies which will continue in the future, as they have in the past, to delight all lovers of the great out doors, to sharpen our powers of observation and to help us the better to appreciate what we see.—W. S.

Nelson on Two New Birds from Panama.²—The specimens here described are from the rich collections made by Mr. E. A. Goldman on the Smithsonian Survey of Panama. Mr. Nelson names them *Capito maculicoronatus pirrensis*, the Mount Pirri Barbet, and *Pseudotriccus pelselni berlepschi*, the Berlepsch Flycatcher.—W. S.

Bent on a New Crossbill from Newfoundland.³—A series of eleven Crossbills obtained by Dr. L. C. Sanford in Newfoundland prove to be

¹ Field-Days in California | By | Bradford Torrey | With Illustrations from Photographs | [vignette] | Boston and New York | Houghton Mifflin Company | The Riverside Press, Cambridge | 1913. 12mo, pp. 1-235. Frontispiece portrait and eight half-tone plates. \$1.50 net.

² Two New Species of Birds from the Slopes of Mount Pirri, Eastern Panama. Smithsonian. Misc. Collec., Vol. 60, No. 21, pp. 1-2. February 26, 1913.

³ A New Subspecies of Crossbill from Newfoundland. By A. C. Bent. Smithsonian. Misc. Collec., Vol. 60, No. 15, pp. 1-3. December 12, 1912.

larger and deeper colored than *Loxia curvirostra minor* with a larger and heavier bill. Mr. Bent proposes to separate them as a distinct race under the name of *Loxia c. perca*.— W. S.

Mearns on a New African Grass Warbler.¹— To the several new forms of *Cisticola* recently described by Dr. Mearns he now adds another *C. prinoides wambugensis* from Wambugu, British East Africa, obtained in 1909 on the Smithsonian Africa Expedition.— W. S.

Ornithology in the Smithsonian Report for 1911.— Among the reprinted articles which form part of the Annual Report of the Smithsonian Institution for 1911 four deal with birds. These are 'A History of Certain Great Horned Owls,' by Charles R. Keyes, from 'The Condor,' 1911; 'The passenger Pigeon,' accounts by Pehr Kalm, from 'The Auk,' 1911 and by J. J. Audubon, (Ornithological Biography, Vol. 1); 'On the Position Assumed by Birds in Flight,' By Bentley Beetham, from 'British Birds,' 1911; and 'Note on the Iridescent Colors of Birds and Insects,' By A. Mallock, 'Proceedings of the Royal Society,' London, 1911.— W. S.

Horsbrugh's Game-Birds and Water-Fowl of South Africa.²— The concluding part of this attractive work is now before us and it fully maintains the high standard of the earlier parts. Fifteen species of Anatidæ and the Hadada Ibis are figured and described. The last Major Horsbrugh tells us "not really a game bird but is most excellent eating and is always a welcome addition to the bag." The index, preface and title page accompany this installment and it is to be regretted that there is not an abstract of the laws of South Africa defining and protecting gamebirds.— W. S.

Hellmayr on Birds from the Mouth of the Amazon.³— This valuable contribution to Brazilian Ornithology is prepared with the same skill and carefulness that characterizes the work of the author and further illustrates his broad knowledge of the neotropical avifauna.

The paper is divided into six parts.

I. 'A review of the birds collected in the Para district'; a fully annotated list of 179 species, with discussion of ranges and relationship with allied forms.

¹ Description of a New African Grass-Warbler of the Genus *Cisticola*. By Edgar A. Mearns. *Smithson. Misc. Collec.*, Vol. 60, No. 20, pp. 1-2. February 14, 1913.

² The Game-Birds and Water Fowl of South Africa by Major Boyd Horsbrugh, with Colored Plates by Sergeant C. G. Davies, Part 4. London. Witherby & Co., 326 High Holburn. December 11, 1912.

³ *Zoologische Ergebnisse einer Reise in das Mündungsgebiet des Amazonas* herausgegeben von Lorenz Müller. II. Vogel von C. E. Hellmayr. *Abh. Königl. Bayern. Akad. Wiss.* XXVI, 2. pp. 1-142. November 15, 1912.

II. 'A revision of the Avifauna of the Para district,' comprising a list of collectors, localities, a bibliography and a systematic list of 379 species with localities from which specimens have been recorded. *Dysithamnus mentalis emilae* is described as new from San Antonio do Prata

III. 'Report on the birds collected on the Island of Mexiana' annotated list of 39 species.

IV. 'Revision of the birds of Mexiana Island' 157 species listed.

V. Report on the birds collected on the Island of Marajo'; annotated list of 40 species.

VI. 'Zoogeographic consideration of the Avifauna of the region about the mouth of the Amazon.'

Such contributions as this are bringing our knowledge of the avifauna of South America nearer and nearer to that state of accuracy which characterizes the ornithology of North America, and this paper of Mr. Hellmayr's will prove of great assistance to investigators of the bird life not only of the Para district but of other more or less contiguous areas.— W. S.

McAtee's 'Index to U. S. Department of Agriculture Publications on the Food of Birds.'¹— So numerous are the publications of the U. S. Department of Agriculture, dealing with the food habits of birds, that an index such as Mr. McAtee has prepared is a practical necessity if we are to readily find the information that we seek. The index covers 131 documents, referring to the economic status of no less than 401 species of native birds and 59 foreign or introduced species. A bibliography precedes the index proper and the latter is remarkably full, with an abundance of sub-headings under each species giving the various items of food and other details, which greatly aid the economist in finding just the information he desires.— W. S.

Craig's Studies of Bird Behavior.²— Mr. Craig describes in detail the hatching of two young doves (*Turtur risorius*). The birds made a series of strong movements with several seconds rest between; each movement seemed to consist of (1) a pushing lengthwise, (2) a thrusting of the bill through the shell, or sometimes only bulging it, (3) a turning round a few degrees which brought each bill thrust a little beyond the last. Mr. Craig finds only two recorded instances of the observation of the hatching of wild birds *i. e.* by W. H. Hudson, 'The Naturalist in La Plata' and R. T. Moore, 'The Auk' 1912, p. 218, dealing with the Jacana and Least Sandpiper respectively. It would seem therefore that there was opportunity

¹ Index to Papers Relating to the Food of Birds by Members of the Biological Survey in Publications of the United States Department of Agriculture, 1885-1911. By W. L. McAtee. U. S. Dept. Agr., Biological Survey, Bull No. 4. Washington, 1913. pp. 1-69.

² Behavior of the Young Bird in Breaking out of the Egg. By Wallace Craig, Jour. Animal Behavior, July-August, 1912, pp. 296-298.

Observations on Doves Learning to Drink, *do.*, pp. 273-279.

here for some valuable observations and it is strange that a field which lies open to every student of bird life has been so universally neglected.

In another paper the same author discusses young doves learning to drink and concludes that the first drinking is an involuntary reflex act when the bill becomes accidentally submerged and the inside of the mouth is moistened. The difference in the method of drinking in pigeons and domestic fowls is emphasized.—W. S.

Tschusi zu Schmidhoffen on Austrian Ornithological Literature for 1911.¹—A bibliography of about 400 titles, many of them local and popular, and many from journals not readily accessible in America. The list is carefully prepared and forms a valuable paper of reference while it impresses one with the enormous amount of ornithological literature that is being put forth in the world today.—W. S.

Mrs. Myers' 'The Birds' Convention.'²—This³ attractively printed little book is designed to interest young folk in birds and bird protection. For very little children a book of this sort, in which the birds are personified, will no doubt prove attractive, but as they grow older boys and girls, we think, soon prefer something that is not quite so obviously intended for the young. The half-tones with which the work is illustrated are excellent.—W. S.

Grinnell on Conserving the Band-tailed Pigeon as a Game Bird.³—Mr. Grinnell treats at length of the distribution, food, nesting, economic status etc., of this valuable bird in California. He concludes from the evidence collected that though widely scattered in the breeding season, in winter all the individuals inhabiting the Pacific coast gather in the valleys and foot hills of west, central and southern California. It is obviously during the latter season that the species is in danger of extermination and Mr. Grinnell considers that the decimation has gone so far that a close season of five years is the only way to bring the birds back to a status that will warrant an annual open season. Up to the present time the Band-tailed Pigeon has been left practically unprotected and its slow rate of increase—only one young being reared by each pair—has failed to keep pace with the winter slaughter, which in 1911-12 was very heavy.

¹ Ornithologische Literatur Österreich, Bosniens, und der Herzegowina, 1911. Von Viktor Ritter von Tschusi zu Schmidhoffen. Verhandl. der k. k. zool.-botan. Gesellsch. in Wien. 1912. pp. 260-289.

² The Bird's Convention. By Harriet Williams Myers, Secretary California Audubon Society, with Illustrations from Photographs by the Author. Western Publishing Co., Los Angeles, Cal., 1912. pp. 1-81. 75 cents, postage 6 cts.

³ The Outlook for Conserving the Band-tailed Pigeon as a Game Bird of California. The Condor, January, 1913. pp. 25-40.

California should take heed of Mr. Grinnell's timely warning and not repeat on the Pacific slope the ever-to-be-regretted folly that was perpetrated in the case of the Passenger Pigeon in the east.— W. S.

Henshaw's 'Fifty Common Birds of Farm and Orchard.'¹— This admirable publication is designed as an 'Educational Leaflet' to aid people, especially in the more remote parts of the country, to become familiar with their more important bird friends. It will undoubtedly reach hundreds of persons who are quite out of touch with more general works on ornithology and do a world of good.

The great desideratum in such a pamphlet *i. e.* colored illustrations which will render unnecessary the tedious and bulky printed description, has been met by fifty excellent color figures from paintings by Fuertes, which are run into the text, two on a page, somewhat after the style of Reed's 'Bird Guide.' The accompanying text which is of necessity very limited is admirably compiled. The length of the bird is given, sometimes with a line or two on color or form; and then come two paragraphs covering 'Range' and 'Habits and Economic Status,' with frequent reference to other publications of the Biological Survey. An introduction of six pages covers forcibly the principles of economic ornithology.

Taken in its entirety we doubt if so much sound ornithology has ever been presented in such a small space and the pamphlet should not only enlist a multitude of recruits in the cause of bird protection but it should develop a number of ornithologists as well. It is to be hoped that this 'Bulletin' will not be allowed to go 'out of print.' Perhaps by coöperation between the Agricultural Department and the Audubon Societies it might be kept always available.— W. S.

Three Important Economic Reports.— In this annual report as Chief of the Biological Survey, Mr. H. W. Henshaw² presents the usual interesting summary of the work of this important division of the Department of Agriculture. The relation of birds to the Alfalfa and Boll Weevils, and the Chestnut-bark Disease, have been investigated, and publications continued on the food habits of various common birds. The bird-life of Porto Rico and Alabama has been studied as well as the status of the English Sparrow and European Starling and means of trapping the former.

Under importations it is interesting to know that upwards of 457,000 live birds were brought into the United States during the year 1912, of which 362,604 were canaries, 50,086 were game birds and 44,387 non-game birds other than Canaries.

The California Associated Societies for the Conservation of Wild Life³ have issued a pamphlet entitled 'Western Wild Life Call' which contains

¹ Fifty Common Birds of Farm and Orchard. Farmer's Bulletin 513, U. S. Dept. Agriculture, 1913: pp. 1-31.

² Report of the Chief of the Bureau of Biological Survey for 1912. By Henry W. Henshaw. Annual Reports of the Dept. of Agriculture, 1912. pp. 1-24.

³ Western Wild Life Call. Published by the California Associated Societies for the Conservation of Wild Life. Feb. 7, 1913. pp. 1-16.

strong articles from the leaders in this movement and direct appeals for the passage of desirable legislation now before the state law-makers. The illustrations and diagrams are striking and convincing.

Mr. E. H. Forbush¹ in his fourth annual report as state ornithologist of Massachusetts, considers bird boxes, English Sparrow traps and the economic importance of certain species of native birds. Most interesting however is the account of the presence of a flight of White Egrets in the state during parts of July and August. Four of the birds were shot and three of the shooters were arrested. With increased protection in the south these visitations should soon be of annual occurrence.—W. S.

Economic Ornithology in Recent Entomological Publications.—

Since the first investigations of the gypsy moth in the United States birds have been given a greater or less share of the blame for the continued spread of the pest. The evidence that has been brought forward is reviewed by A. F. Burgess in his recent bulletin² on 'The Dispersion of the Gypsy Moth' and in summing up he concludes that birds are practically guiltless.

Mr. Burgess takes about the same view of the experimental evidence that birds may distribute gypsy moth eggs, as that expressed by the reviewer in the April, 1911, *Auk* (pp. 285-286). With regard to Collins' experiments on English Sparrows and pigeon he says: "These experiments indicate the extreme improbability of either of these birds selecting gypsy moth eggs for food, and the chances of the insect being disseminated in this way appear very slight" (p. 13). With regard to Reiff's experiments Mr. Burgess says: the "conclusions seem too sweeping because of the large percentage of the eggs [that had passed through the digestive tracts of the birds] that failed to hatch, and when the conditions under which the birds were fed is considered it is doubtful whether comparable result would be secured under natural conditions" (p. 14).

The chances of the dispersion of the moth through the dropping of caterpillars picked up and carried to a distance by birds are considered very remote. Of all the suggested modes of distribution by birds, the only one held at all probable is the carrying of twigs bearing egg clusters, by crows, hawks and other large birds, and the opinion is expressed that although "this may happen in some cases . . . it would result in local rather than long distance dispersion." The final conclusion is that "the evidence is wholly inadequate to prove that birds were responsible for distributing the gypsy moth to the large area which was annually becoming infested" (p. 15). The chief means of the dispersion is the wind which carries about the young larvae. The latter are provided with aerostatic hairs.

Wild birds receive much credit as enemies of locusts in the Philippines.

¹ Fourth Annual Report of the State Ornithologist. By Edward Howe Forbush. Fifty-ninth Annual Rept. State Board of Agriculture. [Mass.] 1912 pp. 1-32.

² Bull. 119, U. S. Bureau of Entomology. 1913. 62 pp.

Messrs. Jones and Mackie, writing of the locust pest in *The Philippine Agricultural Review*¹ (Vol. VI, No. 1, Jan. 1913) say that the migratory locust is, and for many years has been, the worst destructive insect pest of the Philippines, and that their enemies the wild birds "are of more importance than is generally believed for they, from the very first appearance of the young locusts as they issue from the ground, wage a continuous warfare upon the swarm." (pp. 18-19.) The chief locust destroyers are the Luzon Shrike (*Otomela lucionensis*), Carabao Bird (*Bubulcus coromandus*), two species of kingfishers, Variegated Curlew (*Numenius variegatus*), Golden plover (*Charadrius fulvus*), two species of quails, the Jungle Fowl (*Gallus gallus*), Roller (*Eurystomus orientalis*) and two species of bee eaters.

In an account of the insect enemies of cacao, P. L. Guppy says:² "it would seem that all birds are useful to the cacao planter, especially those of the woodpecker type, even though some of the latter do occasionally make holes in pods." The King-of-the-Woods (*Momotus swainsonii*) also accused of eating pods, is shown to be chiefly insectivorous and to be an enemy of the cacao beetle, the plant's most serious insect pest. "Birds and lizards" says the author "are the planter's best friends." — W. L. M.

More Economic Papers by Bryant. A Correction.—Mr. H. C. Bryant's activity in his capacity as a research assistant, under the auspices of the California State Fish and Game Commission, has been so great and the results so promising, that ornithologists will regret to learn of the discontinuance of the work. Two papers incidental to the investigation of the food of the western meadowlark have recently appeared. These are: "The number of insects destroyed by western meadowlarks"³ and "Some insects and other arthropods in the diet of the western meadowlark."⁴ In the first it is shown that western meadowlarks in certain localities in California consumed on the average 10 cutworms or 10 grasshoppers per meal, exclusive of other food. Thus each bird at the lowest estimate was destroying from 40 to 80 of one or the other of these groups of insects per day throughout the summer, and according to Mr. Bryant such cases prove that birds "play a much more important part as checks on the numbers of insects than many people have hitherto believed."

In the second paper the author gives a general review of the arthropods found in stomachs of the western meadowlark. "The ordinary articles of diet are ground beetles (Carabidæ, Tenebrionidæ) grasshoppers, crickets, cutworms, wireworms, plant bugs (Pentatomidæ) certain bees, wasps and ichneumon flies and ants. The extraordinary articles of diet can be summed up as: centipedes, millipedes, scorpions, certain crustacea, snails, spiders, and protected and stinging insects." It should be noted that the

¹ Review of preliminary paper in *Auk*. 28. Oct., 1911, p. 506.

² *West Indian Bulletin*. XII, No. 3, 1912, p. 311.

³ *Science*, N. S. 36, pp. 873-875, Dec. 20, 1912.

⁴ *Pomona College Journal of Entomology*. Vol. 4, No. 3, Nov. 1912, pp. 807-809.

last two classes named are by no means distinct categories from the preceding items of the list, as Carabidæ, Tenebrionidæ, Pentatomidæ, bees, wasps, ichneumon flies, ants, centipedes, millipedes, scorpions and spiders (11 out of 15 categories) are themselves classed by the Poulton school as protected insects. If all of the so-called protected classes of insects were really protected from the attacks of birds, the latter certainly would be hard put to it to find a living. But they do live and feed, I may safely say, without prolonged consideration of the theoretically protected condition of so much of their prey. The special instances of supposedly protected insects being eaten that are pointed out by Mr. Bryant, are the following: "millipedes . . . usually considered to be well protected . . . by certain secretions which produce a pungent odor"; cow killers (Mutillidæ); and the very hairy larva of *Ewanessa antiopa*.

In a review in the last number of 'The Auk' of one of Mr. Bryant's papers, the writer thoughtlessly did an injustice by contrasting one of Mr. Bryant's statements about conditions in California with conclusions drawn entirely from Eastern experience. This was in regard to food supply being in the last analysis the most important factor limiting the numbers of birds. In the humid east there is no doubt that food supply is *not* of primary importance in determining the numbers of at least the *seed-eating* birds. Regarding a climate where long and continued droughts prevail, a different conclusion is no doubt justifiable. Especially if a drought begins early in the summer after most of the seeds have sprouted, and new ones are not yet formed, the crop of seeds for that and the succeeding year will be very greatly reduced. Under such circumstances it is conceivable that seed-eating birds if present in abundance might have difficulty in finding sufficient food. We know that in Australia where droughts and rainy seasons endure for series of years, that almost the whole bird population shifts from place to place and that with many species, reproduction is carried on only in the rainy districts where food is plentiful.

The reviewer regrets his careless comment on this point, and hopes the present explanation will make clear that his purpose at least is to stick as close to facts as possible.—W. L. M.

Relation of the Turkey-buzzard to Diseases of Live-stock.—In the past few years wide currency in the South has been given to the accusation that Turkey-buzzards spread such diseases of live-stock as hog-cholera, black-leg and anthrax. This scavenger therefore has been threatened with persecution in the land where heretofore it has received the most zealous protection. It is of great interest that the results of a scientific study of "Anthrax of animals in Panama, with a note on its probable mode of transmission by buzzards"¹ show that the transmission of the disease probably never occurs in the way ordinarily supposed, *i. e.* by the voiding of live bacilli in the feces of buzzards. The authors, Drs. S. T. Darling and L. B. Bates, describe their results as follows, beginning with observations on the

¹ Amer. Vet. Rev. 42, No. 1, Oct., 1912, pp. 70-75.

habits of buzzards when feeding on carrion: "They congregate about a dying animal, plucking out the eyes and tearing off soft parts even before death. Thus they pick away the mucosa of the anterior nares, pluck out the eyes and the soft parts around the anus and sheath. As decomposition advances and the tissues soften, the birds crowd into and upon the carcass, literally smearing the decomposed material over their plumage. In the case of an animal dying of anthrax, the tissues contain enormous numbers of bacilli. These in contact with air on the plumage of the bird go into spore formation, and buzzards most certainly act as carriers of infection, by transporting anthrax bacilli and spores from one place to another in this way. Some personal (immediate) contact with animals or pastures would be necessary in this case for infection. If, however, the spores of anthrax bacilli pass intact through the intestinal tract of buzzards, pastures might be infected from the droppings of birds that had fed on animals dying of anthrax.

"The following experiments were carried out to determine the likelihood of that possibility. Three Turkey-buzzards were selected from a lot supplied through the kindness of the Health Officer, Panama, and the Sanitary Inspector at Empire. The buzzards were kept in an isolated room and were given a plentiful supply of drinking water and chopped meat. This meat was thoroughly soaked and mixed with a saline emulsion of anthrax bacilli and spores grown on agar plates. On account of the filthy habits of the birds, it was impracticable to obtain specimens of feces in which food contamination could be ruled out except by holding the birds and inserting a swab or catheter into the cloaca. Abundant material was obtained in this way. Specimens were taken at approximately 12, 36, 60 and 84 hours after feeding. Numerous agar plates were immediately made, but in none was the anthrax bacillus present.

"In order to introduce a maximum number of the bacilli, the experiment was repeated with the following variation: Instead of mixing food and cultures a rubber catheter was introduced into the gullet of the buzzard and about 20 c. c. of a very heavy saline emulsion of anthrax bacilli and spores were injected through a catheter into the stomach by a Luer syringe. The buzzards were watched to see that they did not regurgitate or otherwise unlawfully dispose of the dose. Agar plates were made as before, and anthrax bacilli were found to be absent. Shortly after these experiments were completed the birds were killed and cultures taken from various portions of the intestinal tract. Anthrax bacilli were absent.

"We conclude from this experiment that pastures and other locations cannot be infected by buzzards through the agency of droppings, but require more intimate contact.

"The experiment just outlined illustrates the very powerful digestive mechanism of buzzards for bacteria, and when we consider that the food of carrion birds is sometimes almost wholly bacteria and bacterial products, we are not surprised at the facility with which they appear to destroy all bacterial species" (pp. 74-75).

From the above experiments it is clear that the possibility of buzzards

transmitting anthrax is small. Drs. Darling and Bates show that it is practically impossible by agency of the dejections of the birds, and it is obvious that the other possible mode requiring actual bodily contact of the buzzards with live-stock is not likely to be in operation often.

An investigation of "Carrion feeders as disseminators of Anthrax or Charbon,"¹ by Dr. Harry Morris, of the Louisiana Agricultural Experiment Station, confirms the findings of Drs. Darling and Bates with regard to the destruction of the disease bacilli by the digestive processes of the buzzard. Dr. Morris says "no anthrax was found in the posterior part of the digestive tract, none being found beyond the stomach, and but little in that organ. These experiments show quite conclusively that the anthrax bacteria do not pass through the digestive tract of the buzzard and consequently are not disseminated in the droppings of these scavengers." (p. 6.)

It was found that anthrax bacilli remain alive upon the beaks and feet of buzzards for at least 48 hours. The author therefore thinks that pasturage and water might be contaminated in this way, and thus become sources of infection. He says anthrax spores will live in water for years without decrease in virulence. Fortunately Dr. Morris included other carrion feeders in his experiments. It was found that (1) "Anthrax spores are not destroyed in the digestive tract of the dog. They were found in the feces six days after anthrax had been fed." (2) "The feces of the hog contained anthrax for a period of five days after eating the spores." (3) "Anthrax was found in the feces of the cat for a period of four days after eating anthrax spores." (4) "Anthrax is not destroyed in the digestive tract of the opossum." (5) "We were unable to produce anthrax in chickens, but the spores were not destroyed in the digestive tract. The feces contained anthrax for a period of forty-eight hours after eating spores." (6) "Anthrax is present on the bodies and feet and the excrement of flies that have been feeding on infected carcasses." (p. 16.) "What is the importance of this fact? Cobb has shown that a fly will defecate on an average of once every five minutes, or twelve times an hour. If anthrax spores are excreted for a period of ten hours — and it has been proven that they are carried for a much longer time — in that time the fly will defecate one hundred and twenty times. The fly after feeding on an infected carcass would doubtless deposit these germ-laden "specks" over a considerable area and may start a number of centers of infection." . . .

"Knowing that the fly carries anthrax in the digestive tract and on its body, it is possible that it is one of the chief causes of our severe outbreaks of anthrax. Quite often carcasses are allowed to remain where the animals die, and in these cases the flies eat on the anthrax material, spreading the infection over considerable areas." (p. 13-14.)

It would appear, therefore, that the buzzard has much the best record of any of the carrion feeders studied, as it is the only one that does not, distribute anthrax bacilli in its feces. Some of the other animals, as the dog,

¹ Bull. 136, La. Agr. Exp. Sta., Nov. 1912, 16 pp.

opossum and swine are just as apt to contaminate water as the buzzard (pasturage also in the case of hogs), and the dog and chickens are far more likely to carry infection by bodily contact with other domestic animals than the buzzard. It seems evident therefore that at the same time that steps are being taken to greatly reduce or exterminate a wild bird — the buzzard — which may possibly play a minor part in the transmission of anthrax, farmers are harboring several domestic animals that have far greater possibilities as spreaders of the disease. The fact that the disease may be carried by flies is more than sufficient to explain the most severe epidemics.

However, the real fault lies with none of these animals, but with man himself. Dr. Morris says "we believe that the neglect to properly dispose of anthrax carcasses is, without doubt, the factor most responsible for the continuance and spread of anthrax." (p. 16.) In accordance with the most primitive ideas of sanitation, the cleaning up of all kinds of matter likely to become the source of disease, has too long been left to the buzzard, opossum and the domestic scavengers in the South. It is inexcusable to wage warfare upon a bird which cannot harm us unless we give it the opportunity by our own criminal negligence. Let the farmers bury deeply all animals dying on their premises, doing this as promptly as possible after death, and there will soon be no reason for laying blame for the transmission of stock-diseases upon any animal, wild or domestic.—
W. L. M.

Cassinia, 1912.¹ — Under the new regime 'Cassinia' remains the same interesting yearbook of an ornithological club that evidently is very much alive. We note that Mr. Stone, the former editor, is the principal contributor, three articles being credited to him. One is a sympathetic sketch of the life of General George A. McCall, who was one of the chief aids to Cassin in the preparation of his book on the 'Birds of California and Texas.' Mr. Stone presents also the customary summary of observations on the migration of birds in the vicinity of Philadelphia. A slightly larger number of migrants arrived later than the average date of arrival than earlier. Attention is called to the greater variation in this respect of the earlier migrants. Two striking features pointed out are the scarcity of Bluebirds and the unusual abundance of Goldfinches in April.

Another article on migration, by Professor W. W. Cooke, contrasts the dates of arrival in 1791 as recorded by Dr. Benjamin S. Barton with the average dates for recent years. There is no significant variation in the lists at opposite extremes of more than a centenary period. Barton's publication contains the earliest record of the Swallow-tailed Kite for Pennsylvania, one of the very few records of the Carolina Parakeet for that state and the only one for New York.

Mr. Julian K. Potter contributes a 'Preliminary Report on Roosting Habits of the Purple Grackle in the Delaware Valley.' He finds that no

¹ Cassinia. A Bird Annual. Vol. XVI. Philadelphia, 1912, 72 pp.

particular type of growth is favored for a roosting place, that the same roosts are resorted to year after year, and that persecution, other than the destruction of trees does not affect roost stability. The number of birds in the roosts constantly increases up to the last of September and the main body of the birds leaves about the last week of October.

This volume of 'Cassinia' contains also a reprint of a newspaper article relating to a great nesting of Passenger Pigeons in Forest and Warren Counties, Pa., in 1886; a collection of reminiscences of Philadelphia collections and collectors, by Dr. Spencer Trotter; a bibliography of Pennsylvania ornithology for 1912; a list of members and the proceedings of the Delaware Valley Ornithological Club. The average attendance of the 15 club meetings during the year was 22, and it is stated that only once in 15 years has the average fallen below 19. This is a record of which any local ornithological club might well be proud.—W. L. M.

The Ornithological Journals.

Bird-Lore. Vol. XV, No. 1. January-February, 1913.

The Duck Hawks of Taughannoek Gorge. By A. A. Allen and H. K. Knight. With excellent illustrations.

Local Decrease in Bluebirds. By W. W. Cooke.—Affected area lies just north of the regular winter range.

Notes from Labrador. By A. C. Bent.

The Migration of North American Sparrows. By W. W. Cooke.—The Snow Buntings. Plumage notes by Chapman and color plate by Fuertes. Bird-Lore's Thirteenth Bird Census.—199 lists are published.

The Hudsonian Curlew by A. C. Bent and the Ruffed Grouse by Geo. Bird Grinnell are the 'Educational Leaflets.'

The Condor. Vol. XIV, No. 6. November-December, 1912.

Study of the Eggs of the Meleagridæ. By R. W. Shufeldt.

Nesting of the Rocky Mountain Nuthatch. By F. C. Willard.

A Horseback Trip across Montana. By Aretas A. Saunders.

Nesting Habits of the Western Bluebird. By Harriet W. Myers.

W. L. Sclater presents a reply to W. W. Cooke on his 'Birds of Colorado.'

The Condor. Vol. XV, No. 1. January-February, 1913.

A Glimpse of Surf-Birds. By W. L. Dawson.—Illustrated by a series of remarkable photographs.

Concealing and Revealing Coloration of Animals. By Junius Henderson — A general review of the problem.

Swallows and Bed-bugs. By Edw. R. Warren.—Need of more data on bird parasites emphasized.

Notes on Some Fresno County Birds. By John G. Tyler.—Six species discussed.

Bird Notes from the Coast of Northern Lower California. By George Willett.—Annotated list of 98 species.

The Outlook for Conserving the Band-tailed Pigeon as a Game Bird of California. By Joseph Grinnell. (See p. 291.)

The Oölogist. Vol. XXIX, No. 11. November 15, 1912.

The Pine Siskin breeding in Pennsylvania. By R. B. Simpson.

An Orange County [Fla.] Wood Ibis Rookery. By Donald J. Nicholson.

The Oölogist. Vol. XXX, No. 1. January 15, 1913.

Two Weeks Collecting in the High Sierras. By H. W. Carriger.

The Wilson Bulletin. Vol. XXIV, No. 4. December, 1912.

Prothonotary Warblers nesting at Riverside, Illinois. By Orpheus M. Schantz.

Food of Herons and Ibises. By Oscar E. Baynard.

A Robin's Roost. By A. J. Stover.

The Birds of Pelee Island, Ontario, Canada. By Lynds Jones.

The Brown Thrasher East and West. By Althea R. Sherman.

The Ibis. X Series. Vol. I, No. 1. January, 1913.

On a rare Species of Touracou (*Turacus ruspolii*). By T. Salvadori.—
A colored plate and detailed description of the unique specimen in the
Museum of Genoa, obtained by Prince Ruspoli near Abai Lake, Abyssinia.

A Third Contribution to the Ornithology of Cyprus. By John A.
Bucknill.—A summary of the author's studies during a residence of some
years, which has just terminated. A good map is presented, together with
a discussion of the game and game laws, and notes on a number of species.

Note on a new Species of Pueras Pheasant found in the Province of
Anhwei or Ngan Hwei, China. By Rev. F. Courtois.—Colored figure of
Pucrasia jontiana and a key to the species of the genus.

The Birds of Hong Kong, Macao, and the West River or Si Kiang in
South-East China, with special reference to their Nidification and Seasonal
Movements. By R. E. Vaughan and K. H. Jones.—The first instalment
covers 102 species, the habits of many of which are treated at considerable
length. The paper is based upon the authors' field experience covering a
number of years.

Notes on the Birds collected by the B. O. U. Expedition to Dutch New
Guinea. By W. R. Ogilvie-Grant.—Reprinted "with a few additional
notes and slight alterations" from Mr. Wollaston's 'Pygmies and Papuans,'
with a full bibliography.

Commentary on the 'Hand-list of British Birds.' By P. L. Sclater.—
This consists of a history of the adoption of the Stricklandian Code and a
plea for its use rather than the International Code in preparing a British
list. The names of the new 'Hand-list' and the old 'B. O. U. List' are
given in parallel columns showing that 200 out of the 376 have been changed
to a greater or less extent. Dr. Sclater presents no new arguments, but
reiterates his opposition to changes of any kind and to the use of tautonyms
and the tenth edition of Linnæus.

Solander as an Ornithologist. By Tom Iredale.—An interesting account
of Solander and Banks and the rediscovered manuscripts on the *Procellari-*
dæ of Cook's first Voyage.

British Birds. Vol. VI, No. 7. December, 1912.

Migration Notes from Holy Island, Northumberland, Autumn, 1912.

By H. F. Witherby.—Records of species rare or new to the county. Numerous records of recovered marked birds are given in this number.

British Birds. Vol. VI, No. 8. January, 1913.

Notes on the Bird Life of South-west Iceland. By Rev. F. C. R. Jourdain.

William Bernhard Tegetmeier. By F. W. Smalley.

Recovery of marked birds.

British Birds. Vol. VI, No. 9. February, 1913.

Field-Notes on a Pair of Stone-Curlews. By F. G. Penrose.—Observations from a photographer's tent, which led Dr. Penrose to surmise that these birds had some sense of smell which led them to be suspicious of his presence. He attributes a sense of smell only to ducks and possibly to certain waders. The paper is illustrated by a color plate taken direct from a Lumière autochrome.

The British Black Grouse (*Lyrurus tetrix britannicus*, subsp. nov.) By H. F. Witherby and Einar Lönnberg.

Barrow's Golden-eye and the Common Golden-eye. By H. F. Witherby.—Difference in scapular-feathers illustrated and described, also difference in frontal bone.

The Avicultural Magazine. Vol. IV, No. 2. December, 1912.

Successful Breeding of the Grand Eclectus Parrot. By Miss Drummond.

Breeding of the Hooded Siskin (*Chrysomitris cucullata*.) By Dr. M. Arnsler.

Evidence afforded by Captive Birds. By Dr. Arthur G. Butler.—Discusses some of the points raised by Mr. W. L. McAtee in his recent paper on 'Warning and Cryptic Colors.'

The Plumage Question and Aviculture. By J. Lewis Bonhote.—A discussion of the Egret problem and the possibility of rearing them in captivity. A French firm has offered a prize of \$2000 for the first Egret farm established on French territory with no result as yet. As is pointed out the experiment would involve a far greater expenditure than this, and even so, the practicability of the venture seems extremely doubtful.

The Avicultural Magazine. Vol. IV, No. 3. January, 1913.

Articles on Breeding of the Hooded Parakeet, and on Bengalese Rice Birds and Nuthatches in captivity.

Some Spontaneous Variations in Mallard and Muscovy Ducks. By Frank Finn. (Continued in February.)

The Bird Show at Horticultural Hall. By Herbert Goodchild.

The Avicultural Magazine. Vol. IV, No. 4. February, 1913.

The Mexican Pied Ground Thrush (*Geocichla* [= *Ridgwayia*] *pinicola*.) By Hubert D. Astley.—Habits in captivity with a colored plate of the male and female.

The Whinchat as a Song-bird. By W. E. Teschemaker.

Hooded and Golden-shouldered Parrakeets. By Hubert D. Astley.—Discusses relationship of *Psephotus cucullatus* and *P. dissimilis*.

Other articles on *Columba albicularis* and Cranes.

Bulletin British Ornithologists' Club. No. CLXXXII, November 29, 1912.

New species described: *Acrocephalus tangorum* La Fouché, Chin-wang-tao, China; *Luscinola pryeri sinensis* Witherby, Hankow, China; *Grallaria guatemalensis aripoensis* Hellmayr and Seilern, Trinidad; *Geotrygon linearis trinitatis* Hellmayr and Seilern, Trinidad; *Æthiopsar cristatellus formosanus* Hartert, Formosa; *Phasianus strauchi chonensis* Ogilvie Grant, Tau River, Kansu; *Polioptila elgonensis* Ogilvie Grant, Mt. Elgon, British East Africa; *Campophaga martini* Jackson, Uganda.

Mr. Erwin Stresemann spoke on some parrots obtained on the second 'Freiburger Molukken-Expedition.' *Eos semilarvata* the habitat of which was unknown, was found at a high elevation in Ceram.

Mr. Ogilvie Grant discussed the differences in the scapular feathers of *Clangula* as a means of distinguishing the species.

Bulletin British Ornithologists' Club. CLXXXIII. December 27, 1912.

D. Seth Smith exhibited the downy young of *Larus hemprichi* which is pale buffy white, unspotted.

Hon. Walter Rothschild described *Fondia omissa* sp. n. from Madagascar.

Erwin Stresemann described *Abrornis sakaorum* sp. n. from the Malay Peninsula.

Bulletin British Ornithologists' Club. CLXXXIV. January 25, 1912.

Col. Stephenson Clarke gives an account of a trip to the Lorian, British East Africa, *Heterhyphantes golangi* (Mombasa) and *Laniarius quadricolor nigricauda* (Takaunga) are described as new.

D. A. Bannerman described *Hæmatopus niger meade-waldoi* subsp. n. from the eastern Canaries.

Stuart Baker described *Acanthopneuste trochiloides harterti* subsp. n. Assam Hills.

Tyto alba detorta subsp. n. from the Cape Verde Islands was described by Dr. Hartert.

The Emu. Report of the Twelfth Congress of the Royal Australasian Ornithologists' Union with the address of the new president, Mr. John White Mellor.

Mr. Mellor and Capt. S. A. White also present an account of a 'Camp-out' held on Cape Barren and Flinders Islands at the close of the session. Sixty-five species were observed, and *Falco melonotus*, *Megalurus flindersi* and *Sericornis flindersi* are described as new from the latter island. The authors appear to be in a quandary as to how to name subspecies, since resolutions were adopted by the Congress abolishing trinomials in the official Check List. So while binomial names are used in each of the above descriptions, the first is termed a 'sp. nov.' while the others are 'subsp. nov.' although of what they are subspecies we are not informed.

Other novelties named in the same way are *Cacomantis lineatus* sp. nov. by Alan P. Dodd, from Nelson; *Amytornis merrotsyi* sp. nov. by J. W.

Mellor, from Lake Torrens; *Acanthiza pygmaea* 'subsp. nov.' by A. W. Milligan, from the Mallee district of Victoria. Of only one of these six new forms is a type specimen mentioned. Even if trinomials are tabooed, we fail to see why our Australian confreres should not follow the modern custom of designating definite type specimens for each new form described. If this is not done it will occasion a great deal of trouble later on especially when we consider how rapidly new birds are being discovered.

Field Notes on the Emu Wren (*Stipiturus malachurus*). By Miss J. A. Fletcher.

Occurrence of *Cisticola* in Tasmania. By Miss J. A. Fletcher.

Notes on the Cassowary (*Casuarius australis*). By H. L. White.
— A Valuable series of field notes with excellent half-tones of the nest and habitat.

Field Ornithology in South Australia. By Capt. S. A. White.

Birds of Port Germain, South Australia. By J. W. Mellor.

In 'Stray Feathers,' among various short notes, is a description by A. J. Campbell of a new bird, *Eopsaltria coomooboolaroo*, from the Dawson River district of Queensland.

At the close of the number is a Note on *Epthianura lovensis* Ashly. By Gregory M. Mathews with a colored frontispiece plate of this recently described bird. The author in the course of his remarks proposes to divide the genus *Epthianura* into four genera, of which *Parepthianura* for *E. tricolor*, and *Aurepthianura* for *E. aurifrons* and *E. tricolor*, are proposed as new.

The Austral Avian Record. Vol. I, No. 5. December 24, 1912.

Fourteen new subspecies of Australian birds and fifty-one new genera are proposed by Mr. Mathews. He also discusses the relationship of the avifauna of Lord Howe Island, regarding it as more closely related to New Caledonia than to New Zealand as had been recently claimed by W. R. B. Oliver; and contributes two short notes on a new Snipe for Australia and the use of the name *Coturnix ypsilophorus* for *C. australis*.

Prof. L. Brasil and Tom Iredale discuss the generic names *Antigone* and *Mathewsia*.

Robin Kemp describes three new subspecies of New Zealand Birds.

The Austral Avian Record. Vol. I, No. 6-7. February 28, 1913.

A List of the species of Australian Birds described by John Gould with the Location of the Type Specimens. By Witmer Stone, in conjunction with Gregory M. Mathews — This paper occupies the entire double number. It includes a brief history of the Gould Collection and aims to designate an individual type specimen for every new species described by Gould. The collection being at Philadelphia is inaccessible to the Australian Ornithologists and this catalogue will place at their disposal the more important data regarding the type specimens.

Revue Francaise d'Ornithologie. Vol. IV, No. 44. December 7, 1912.

European Birds of the Genus *Cyanecula*. By Dr. A. Dubois — Recognizes five forms.

- Common Buzzards in Captivity. By Maurice de la Fuye.
- Catalogue of Birds of Montlucon. By R. Villatte des Prugnes.— Includes dates of arrival and departure for 16 years.
- Revue Francaise d'Ornithologie.** Vol. V, No. 45. January 7, 1913.
- Ornithological Notes on the 'Alpilles' Region. By R. Deleuil.
- Protection of Birds in Madagascar. By L. Monnier.
- Revue Francaise d'Ornithologie.** Vol. V, No. 46. February 7, 1913.
- Remarks on the Nesting of the Coot (*Fulica atra*). By Paul Petitclerc.
- Wild Duck (*Anas boschas*) in male Plumage. By Eug. Lamoureux.
- Euthedia olivacea* in captivity. By A. Decoux.
- Journal für Ornithologie.** January, 1913. Vol. 61, No. 1.
- On the Ornithology of Northwestern Mesopotamia and Interior Syria (concluded). By Hugo Weigold.
- A Contribution to the Distribution of Sea Birds. By R. Paefslor.
- The Significance of Egg Shell Structure for the Systematist. By A. Szrelasko.— A microscopical study of the egg shells of European birds with excellent plates illustrating the several types of structure, accompanied by a discussion of the variability of measurements, and the type of shell structure for 54 species, based upon the examination of large series of each. An illustration of what 'oölogy' may lead to if studied scientifically.
- Aeronautical Experiments on the Height Limit of Flying Birds. By F. von Lucanus.
- On the Avifauna of South-eastern German East Africa (continued). By H. Grote.
- On the Avifauna of East and West Prussia. By H. G. von Schweppen-
burg.— List of 134 species.
- A Contribution to the Biology of *Urinator arcticus*. By O. Graf Zedlitz.
- Ornithologische Monatsberichte.** November, 1912.
- On the Geographical Distribution of the Birds of Russian Altai. By P. P. Suschkin.
- A New Flycatcher from the Island of Formosa. By A. Laubmann.—
Abrornis albigularis formosana subsp. nov.
- Dr. J. von Madarasz describes three new African forms; *Pinarochroa rudolphi*, Kilimanjaro; *Cisticola kmunkei*, Elgon; and *Bradypterus elgonensis*, Elgon.
- Is *Haliaeetus leucocephalus* ever seen in Europe? By H. Krohu.— Reviews alleged occurrences.
- Ornithologische Monatsberichte.** December, 1912.
- Circus approximans* Peale in Samoa. By J. Henniger.
- Ornithologische Monatsberichte.** January, 1913.
- Fighting House Sparrows. By R. Biedermann Imhoof.
- Two New Birds from Africa. By J. von Madarasz. *Cisticola elgonensis* Mt. Elgon and *Turtur electus* Maraquo, Abyssinia.
- Remarks on *Carduelis caniceps parapanisi* Koll. By P. Kolliday.
- Upupa waibeli* n. sp. By A. Reichenow — From Camaroon.
- Lamprotornis corrusca* Nordm. an Older Name for *Lamprotornis melano-*
gaster Swains. By Oscar Neumann.

The names *Corvus sinensis* and *Corvus sibiricus*. By E. Stresemann — *C.* [= *Dendrocitta*] *sinensis* Lath. nec Gmel. is renamed *Dendrocitta formosæ sinica*. *C. corax sibiricus* Tacz. nec *C. sibiricus* Gmel. becomes *C. c. ussurianus* Tacz.

Ornithologische Monatsberichte. February, 1913.

On the Biology of *Totanus fuscus*. By W. Hagen.

New Birds from Colombia. By J. von Madarasz.

Synallaxis fuscifrons and *Donacobius brachypterus* both from Aracatuca.

How is *Falco lanarius* Linne 1758 to be determined? By E. Lönnberg.

On the generic names, *Graucalus*, *Coracina*, *Calvifrons* and *Stoparola*. By E. Stresemann.

Sylvia undata corsa subsp. nov. By A. Laubmann.—From Corsica.

Ornithologisches Jahrbuch. XXIII Jargang. Heft 5, 6. September–December, 1912.

Ornithological Observations on Hiddensøe Island during May and June, 1912. By C. Lindner.

Bird-life of the Gschnetztal at Steinach, Tirol. By Otto von Wettstein. Aviariae variae.—Biological Notes and Suggestions. By Dr. B. Plaezek. On the Wood Jays at Vienna in 1911–12. By Alfred Mintus.

Arrival and Departure Dates at Mariahof, 1911. By Jos. Noggler.

On Some Palaearctic Forms. By Viktor Ritter von Tschusi zu Schmidhoffen.

Riparia riparia fuscocollaris subsp. nov. Castelnuovo, South Dalmatia;

Locustella fluviatilis obscura subsp. nov. Liman. Bosn. Gradiska;

Loxia curvirostra corsicana subsp. nov. Corsica and *Coturnix coturnix corsicana* subsp. nov. Corsica.

The Canary Islands. By R. von Thanner.

The Appearance of *Vultur monachus* in Switzerland. By Alb. Hess.

Ornithologische Monatsschrift. Vol. 37, No. 11 and 12. November and December, 1912.

No. 11. On the Songs of our Flycatchers. By B. Hoffmann.

No. 12. The spring Migration of the Stork and the Swallow.

Ardea. Vol. I, No. 3–4. December, 1912.

The Crested Lark at Ede. By J. L. F. De Meyere.

Varia oologica et nidologica. By A. A. van Pelt Lechner.

On the Rhinoceros Hornbill. By L. Baron van Heeckeren tot Waliën.

Some Observations on *Cygnus cygnus* L. By Dr. C. Kerbert.

Account of Ornithological Observations during a Seven Days' Residence on board the Lightship "Maas." By W. C. van Heurn.

Ornithological Observations in Netherland. By Dr. E. D. van Oort.

What Birds one would see on a Voyage to South America. By W. C. van Heurn.

Ornithological Articles in Other Journals.

Stubbs, F. J. A Contribution towards a Solution of the Problem of Migration. (The Zoölogist, No. 858, December 15, 1912) — Argues that "the present balance of life on the earth is made possible by the existence of a mobile mass of animal life flowing twice yearly from hemisphere to hemisphere."

Patten, C. J. Robins [English] on Migration, Observed at the Tuskar Rock Lighthouse (The Zoölogist, No. 859, January 15, 1913.)

Dewar, J. M. Further Observations on the Feeding Habits of the Oystercatcher (*Hæmatopus ostralegus*) (The Zoölogist, No. 860, February 15, 1913.)

Selous, Edmund. A Diary of Ornithological Observations made in Iceland during June and July, 1912. (The Zoölogist, No. 860, February 15, 1913.)

Criddle, N. New or Rare Bird Records from Manitoba, 1912 (The Ottawa Naturalist, January, 1913) — *Sayornis saya* taken at Aweme, April 23.

Saunders, W. E. Lincoln's Sparrow Nesting in Bruce County, Ontario (The Ottawa Naturalist, February, 1913.)

Brock, S. S. The Tufted Duck (*Fuligula cristata*) in the Nesting Season (The Scottish Naturalist, December, 1912.)

Clarke, W. Eagle and the Duchess of Bedford. Notes on Migratory Birds Observed at Fair Isle, 1912. (The Scottish Naturalist, January and February, 1912.)

Thomson, A. L. Aberdeen University Bird-Migration Inquiry (1909-12). (The Scottish Naturalist, 19).— Many records of recapture of marked birds.

Seth-Smith, D. Exhibition of a female *Aix sponsa* which had partly assumed the plumage of the male (Abst. Proc. Zoöl. Soc. London, No. 115. February 4, 1913).

Rothschild, W. and Hartert, E. List of a Collection of Birds made by Mr. Albert Meek on the Kumusi River, N. E. British New Guinea (Novitates Zoöl. XIX, No. 2, 1912. pp. 187-206) — 119 species of which *Pitta mackloti oblita*, *Machaerirhynchus flaviventer novus*, *Coracina papuensis meekiana* and *Pinarolestes megarhynchus superfluous* are described as new.

Rothschild, W. and Hartert, E. List of Birds Collected by Mr. A. S. Meek at Haidana, N. E. British New Guinea (Nov. Zoöl. XIX, No. 2, pp. 207-209).— 33 species.

Hellmayr, C. E. Description of Two New Birds from the Timor Group of Islands. (Nov. Zoöl. XIX, No. 2, pp. 210-211) — *Dicaeum hanieli*, Bonleo, Timor and *Neopsittacus iris wetterensis*, Wetter Island.

Ingram, C. The Birds of Yunan. (Nov. Zoöl. XIX, No. 2, pp. 269-310)— 352 species of which, *Eudynamis orientalis harterti*, is described as new.

Stresemann, E. Ornithological Miscellany on the Indo-Australian Region (Nov. Zoöl. XIX, No. 2, pp. 311-351).— Includes reviews of (I)

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CORRESPONDENCE.

The Concealing Coloration Question.

EDITOR OF 'THE AUK':

Dear Sir:— I rise to a question of personal privilege. In the last number of 'The Auk' you as Editor and two correspondents take exception to certain expressions and certain statements contained in my paper on the Concealing Coloration question in the issue for October, 1912. Such of my language as is declared unparliamentary I gladly withdraw, and for it I tender my formal apologies. As a matter of fact, I did not realize that I was employing a different kind of language from what had been used by others in this discussion. The Editor of 'The Auk,' to be sure, cannot be held responsible in any way for Mr. Roosevelt's paper, which was published elsewhere, but at least one passage in that of Drs. Barbour and Phillips seems to me much more exceptionable than anything that my paper contained. However, bad examples are best not followed, and it would have been better to leave the facts to speak for themselves.

Dismissing the question of the objectionable expressions,— which, of course, I must regret since they have given offense to men whose good opinion I value highly,— I will take up the more serious counter-charges which have been made against me in defense of Mr. Roosevelt. And first I must plead guilty to an error of judgment in grouping 'misquotations,' etc., with 'pieces of faulty reasoning.' Never having had any notion of accusing Mr. Roosevelt of *intentional* misquotation, I carried all these things in my own mind as instances of carelessness and the like and assigned to each class an approximately equal degree of importance. I supposed that I was not including anything debatable in this category, but that the points I made would be instantly seen. In this it seems I was mistaken, and perhaps I gave my readers credit for a fuller knowledge of Mr. Thayer's views than they possessed. I now see my error in including two radically different classes of criticisms in the same category, and regret it exceedingly since it has apparently made a false impression on some readers. As a matter of fact, that sentence might quite as well have been omitted entirely, for I was willing to rest my case on the particular instances I cited.

And now I propose to prove to your entire satisfaction that the two examples of misquotation, or misapprehension, which you say 'cannot be so regarded' are actually what I have asserted them to be. You say: "Mr. Roosevelt was in the first instance not quoting Mr. Thayer verbatim regarding the crouching hare, and merely put in quotation marks some of Mr. Thayer's expressions. What Mr. Roosevelt was pointing out was that in one statement Mr. Thayer regards the running hare as obliterated in the sight of creeping animals, which have their eyes below the level of the hare's tail, while in another statement he regards the crouching hare as boldly conspicuous in the sight of the same class of animals, and this is surely what Mr. Thayer says." Now, I think that if any unbiased person will

read carefully the legend to Fig. 103 of Mr. Thayer's book and the text on page 153, which seem to be the only places in the book pertinent to the matter in hand, he will agree with me that this is a very ingenious explanation but hardly tenable. To assist readers in pursuit of the real facts in the case, I will point out that the words 'quadruped pursuer' do not occur on page 153, while they do occur in the legend to Fig. 103, only a few lines away from the statement in regard to the conspicuousness of the crouching hare 'when seen from the position of a mouse or cricket,' but in connection with the white rump of the leaping hare, and, so far as I can see, in no other place in the whole book. Now one can see in this proximity a very natural explanation of how a careless reader could read one expression in place of the other. If this explanation is incorrect, why, I ask, did Mr. Roosevelt use quotation marks for the expression 'quadruped pursuer'? It is commonplace enough in itself, and no one would think of putting it inside quotation marks except for some special purpose. Is it not obvious that Mr. Roosevelt thought he was virtually quoting Mr. Thayer's entire statement about the crouching hare? If he deliberately substituted the words 'quadruped pursuer' for 'mouse or cricket,' why did he not indicate that he was only drawing an inference, not making a quotation or even a paraphrase from Mr. Thayer, and why did he not use the term 'terrestrial enemies,' which he found ready to hand on page 153? But that Mr. Roosevelt has misread Mr. Thayer on this point is proved beyond peradventure, it seems to me, by the fact that he goes on to say, "If a sitting rabbit is 'boldly conspicuous' to an animal on a level with it, then all of Mr. Thayer's theories go by the board at once, and all animals are always 'boldly conspicuous,' to their foes." Now Mr. Thayer did not say that the crouching hare was conspicuous to an animal, 'on a level with it' but 'from the position of a mouse or cricket,' which animals, of course, would look up at the hare and not view it from the same level. Mr. Roosevelt's attempt to show here that Mr. Thayer is inconsistent is surely a conspicuous failure, is it not? The trouble is that Mr. Roosevelt has in this and the other instance of misquotation, or misapprehension,—to which I shall proceed forthwith,—shown a signal lack of understanding of Mr. Thayer's contentions. If he had approached the book with a reasonable desire to find what there was of good in it, he would never have entertained the notion that Mr. Thayer regarded any crouching animal as conspicuous (in the long run) to its foes,—as if it were necessary for an animal to stand up in order to be obliterated. The whole argument of Mr. Thayer's book is in the opposite direction. It seems plain that Mr. Roosevelt not only misquoted Thayer's words in this instance but failed entirely to grasp the larger meaning of his book.

Now as to the other misreading of which I accuse Mr. Roosevelt, I must admit that, *as you put the case*, I may seem to have misjudged him. You will notice, however, on referring again to the passage you quote from Mr. Roosevelt, that though your footnote asserts that it is quoted verbatim, *you have omitted the very clause against which my criticism was directed!* That you are not unacquainted with the custom of inserting points to

indicate omissions is shown by the quotation thus abridged on the following page, and you must also be aware that it is not permissible to omit any vital part of a quotation, even though the omission be so indicated. (otherwise the points might be substituted for such a word as 'not,' for instance, and the quotation be made to read very differently from the original). This failure to quote the passage actually verbatim, since it has resulted in a serious misrepresentation of my side of the case, must be regretted, I am sure, as much by you as by me. What Mr. Roosevelt really says in the passage referred to — which you will find correctly quoted in my paper — is, "Mr. Thayer insists that the animal escapes observation, *not because its colors match its surroundings*, or because it sits motionless like a stump," etc. You omitted the words I have italicized and, as I have said, these were the very words I attacked. The omission was purely accidental, of course, for I am far from agreeing with Mr. Thomas Barbour that 'a misquotation would probably be wilful' (Auk, XXX, 82), but it was certainly unfortunate.

I think that you will now admit that my point against Mr. Roosevelt in this matter was well taken, but I will seize this opportunity to make the point so clear that no reader can fail to see it. To that end I will quote the same passage from Mr. Thayer's book which you quoted, condensed in the same way, but will italicize only certain words in it instead of the entire passage: "The reader . . . is now in a position to perceive the fallacy of the statement prevalent in former years and still made by certain writers, that a *protectively colored* animal of the type described above escapes detection because being of a dull brown color like the ground and the bushes, it looks when it sits motionless like a clod or a stump or some such inanimate thing. . . . The *protectively colored* animal, on the other hand, is as it were obliterated by its [= his] countergradation of shades. . . . If these animals were *merely* brown or gray like clods or stumps they would not be concealed, because their structural forms are too distinct, and the eyes of enemies are keen to detect their characteristic modelling and outlines. On the other hand, a perfect shade gradation, even of some rankly brilliant color, *would go far toward* concealing an animal." That is what Mr. Thayer says. Now, what does Mr. Roosevelt say? I will quote him again, verbatim, as I did in my paper, but italicizing the crucial portions: "Mr. Thayer insists that the animal escapes observation, *not because its colors match its surroundings*, or because it sits motionless like a stump, or clod, or some such inanimate thing, but *purely* because of its shading, which he says is rendered oblitative by the counter-gradation of shades." I might be content to let these two passages stand in the form of a 'deadly parallel', but experience teaches me that it is safer to make assurance doubly sure. I will draw attention again, therefore, to the fact that it is the *protectively colored* animal that is, according to Mr. Thayer, obliterated by its counter-shading, and other animals achieve only an approximation to that condition, for 'going far toward' concealment is by no means the same as reaching it. And it cannot be contended that in employing the words

'protectively colored' Mr. Thayer was writing loosely and had reference to the countershading itself. Mr. Thayer's book is not written in a loose way. It is a closely written book, on the contrary, and the words are chosen carefully. Mr. Thayer was laying stress on the office of countershading in the passage quoted. It doubtless never occurred to him that it would be necessary to argue for the efficacy of color-matching in concealment, nor could he have foreseen that he would be accused of ignoring it. If he had been arguing with any one who had the notion as to the all-powerfulness of countershading that Mr. Roosevelt has accused him of, he would doubtless have turned his statement about and have said that the countershaded animal is obliterated by its protective coloration, and that even without the countershading the background-matching 'would go far toward concealing an animal.'

You took an unusual course, Mr. Editor, in undertaking to apologize editorially for these two charges of mine against Mr. Roosevelt. Was it really so necessary? If you had been as intent on understanding Mr. Thayer as you have been on defending Mr. Roosevelt, might you not have reached a different conclusion as to the justice of my charges?

As to Mr. Chapman's communication, it seems to me that he is unnecessarily alarmed for the reputation of the bird-photographers. When I ventured the opinion that "the birds in most photographs do not appear at all as they would under average conditions in their natural surroundings," I had reference solely to this matter of conspicuousness. In general I think that bird photographs are of inestimable value to the student, since they show him some things which he could not possibly learn without them, and nothing could have been farther from my thoughts than to charge photographers with doing violence to nature in order to prove a point or make a pretty picture. It needs no extended argument, however, to prove that a bird in a picture, where the observer's eye is inevitably directed towards it, is in the nature of things much more easily to be seen than in the landscape out of doors,—as a general thing, I mean, for there are doubtless exceptions. Mr. Chapman himself says that "no doubt many bird photographs are made with the object of displaying their subject to the best advantage." I think he might have said 'most' instead of 'many' and still have kept within the bounds of truth, for is not that really the aim of most bird photographs,—to show the bird in its natural surroundings as clearly and completely as possible? And such photographs are so far from being 'lacking in scientific value' that their scientific value depends in great measure on their clearness in detail. When I said that the photographer avoided subjects that were obscured, I meant, of course, when he had before him a choice of individuals of the particular species he was desirous of photographing, and doubtless such choice is often unconscious. (Exception should perhaps be made of some of those "puzzle pictures" referred to by Mr. Chapman, where the definite object is to show the inconspicuousness of the bird.) I believe that photographers regard it as legitimate to cut away interfering twigs, etc., in order to reveal a

nesting bird, and this practice cannot be objected to, provided a statement is made that this was done; and yet in those cases the bird is undoubtedly rendered more conspicuous than it is under entirely natural conditions. So also with any bird that nests in the open, away from grass and foliage, the necessary nearness of the camera makes the bird inevitably more conspicuous, does it not? than it would be at a little distance. Now my contention — and I still think it a sound one — is that while some birds (as the woodcock) may be inconspicuous even under the disadvantage of occupying a comparatively large proportion of the field of view in a photograph, it is not sound reasoning to assert that all birds which are conspicuous in photographs are therefore necessarily so in nature. I see, however, that I shall have to acquit Mr. Roosevelt of any unusual degree of inaccuracy in this connection, since so distinguished a field ornithologist as Mr. Chapman supports him. As a matter of fact, though Mr. Chapman has appropriated my words 'inaccurate' and 'slap-dash' exclusively to the single instance of the photographs, this was but one of a number of cases which I thought showed these qualities in the aggregate. It stood first in the list because it came first in Mr. Roosevelt's paper.

Please understand that I am not now saying that Gannets, Murres, Guillemots, etc., are inconspicuous in the field, but simply that photographs alone cannot prove their conspicuousness. For one thing, it appears to me very probable that birds of large, bold patterns, such as most of these rock-nesting birds wear, need a greater distance to make operative whatever concealing power their coloration may have, and that birds that would appear conspicuous from the point of view of the camera might be by no means conspicuous at a greater, though not a great distance.

I have read with interest Mr. Thomas Barbour's latest contribution to this subject of *Concealing Coloration* (*Auk*, XXX, 81-91) and I am glad to see that he thinks he can distinguish common sense from superstition. I dare say, however, that many superstitious persons have been equally sure of their own common sense. The chief difficulty with Mr. Barbour appears to be that he does not perceive that common sense is a subjective quality and that it makes all the difference in the world whose common sense it is — whether that of a well-informed person like himself or Mr. Darwin (whom I quoted on the subject) or that of many a worthy day laborer who does n't know the meaning of the word 'science.' He does not, however, dispute my contention that something besides common sense is needed in discussing scientific questions and that there is such a thing as trusting it too implicitly, which after all was the only point I wished to make.

Now, taking up Mr. Barbour's criticisms seriatim and dealing with them as briefly as possible, after passing over the matter of the 'fifty instances,' etc., in which I have already confessed myself at fault in a certain measure, I come first to his statement that "a bird can be conspicuous in shape by being like a Scissor-tailed Flycatcher," which is certainly begging the question with a vengeance. I freely confess I have never seen a

Scissor-tailed Flycatcher in life, and I should very much appreciate it if Mr. Barbour, who has enjoyed that inestimable advantage, would take pity on my "ignorance," — of just how one of these birds looks in its native haunts, — which is, of course, profound, and explain what makes it so conspicuous to him. I strongly mistrust that he is thinking of his own interest in seeing a bird of so *unusual* a shape rather than of the actual conspicuousness of the bird as a mere bird, an article of food for a predatory animal. For all I know, the Scissor-tailed Flycatcher may be a conspicuous bird in the field, but I venture to guess that if that is the case the reason will be found in its coloration and not in its form. As to the case of the cross fox, I am not now prepared to dispute Mr. Barbour's statement and I will therefore concede him and Mr. Roosevelt that one point! I think I can afford to, and still retain the best of the argument on these disputed cases. As to the possibility of any two species living under precisely the same conditions, I emphatically disagree with Mr. Barbour. Will he deny specifically that a difference in habit constitutes a difference in conditions? As to my opinion of the all-powerfulness of natural selection, he is certainly drawing on his imagination, for nowhere in my paper will he find any such opinion, expressed or implied. He has doubtless forgotten that at one point I argued for sexual selection and that I referred to Mr. Beebe's experiments, which have proved that moisture can virtually turn one species into another. I have no doubt, too, that species have occasionally arisen from mutations. The theorem of Le Chatelier, also, may be applicable, as the chemist W. D. Bancroft has suggested. I am willing, however, to rest on natural selection as the *chief* factor in speciation until a more plausible substitute is offered than has yet appeared.

As a parting fling, Mr. Barbour attributes to me a "desire to simply bolster up the arguments of a friend." In reply to this I must refer the reader to my already fully stated explanations of the object of my paper, and add that, though I should be proud to call Mr. Thayer my friend, my personal acquaintance with him is really very slight, and if I had followed the calls of friendship only, I should have been led in quite another direction. The paper was written entirely of my own motion, without consultation with Mr. Thayer, who never saw it till after it was published, and I alone am responsible for it.

Of the eight counts of my indictment against Mr. Roosevelt, two remain undisputed, and of the other six I think the present letter makes good my claims for all but a single and relatively unimportant one. I should also like to call attention to the fact that of the nineteen pages of my paper only four are devoted to adverse criticism of Mr. Roosevelt.

I am speaking to a question of personal privilege, and though on many accounts I should like to say something more on the larger and infinitely more important question of Concealing Coloration, I shall not stray from the point except to ask your indulgence for a few closing words of an impersonal nature addressed directly to the floor. I beg American ornithologists to study and experiment along these lines for themselves. I feel

very strongly that, whatever the final judgment upon Mr. Thayer's theories may be,— if there ever is a final judgment! — it will not be hastened by ignoring his work or by refusing to listen to his evidence. You will have to give up some preconceived ideas, well fortified behind 'common sense' though they may appear to be. You will have to admit among other things that, as the sky overhead is blue, the skyshine on the snow is blue, that the sky is lighter at the horizon than at the zenith, and that on a moonless night the sky is the lightest and therefore the whitest object to be seen. When you have examined Mr. Thayer's evidence impartially and understandingly, and have accepted the most of it, as I am sure you will do, then you will be in a much better position to arrive at a proper conclusion in regard to his theories than some of his most active critics are now in. I thank you, Mr. Editor and gentlemen.

Yours very truly,

FRANCIS H. ALLEN.

West Roxbury, Mass.

Feb. 14, 1913.

[The editor regrets exceedingly that in going through the press the clause, referred to was accidentally omitted from one of his quotations. He feels however that it in no way affects the point he was trying to make clear, i. e., that the one statement could not be called a misquotation of the other. Indeed in as much as the omission makes the two quotations *less* alike, it really weakens his contention.

As the discussion on Concealing Coloration has already been unduly prolonged it seems desirable to close it at this point.

WITMER STONE.]

NOTES AND NEWS.

On the 27th of January last the Union suffered the loss of one of its most distinguished and universally beloved foreign representatives. There passed away upon that date Professor Robert Collett, the Director of the Natural History Museum of Christiania, Norway, an author of many works, and a Corresponding Fellow of the American Ornithologists' Union since 1883.

Prof. Collett was born in Christiania on the 2d of December, 1842, and consequently he was, at the time of his death, in his 71st year. He was connected with many distinguished people of his own country, being the oldest son of Professor P. J. Collett and the widely known authoress Camilla Collett.

From his earliest boyhood his entire nature exhibited the unmistakable evidences of the coming naturalist, and, although never of a robust physique, or of the strenuous type, he won his title to fame through his supreme gentleness of manner and bearing, as well as through his nobleness of character and sterling qualities.

Academically, he received his education at the University of Christiania, while upon the other hand his ever increasing fund of knowledge was directly attributable to the tuition of that teacher of all teachers of every naturalist — Mother Nature.

His early attainments soon won position for him; in 1871 he became assistant curator of the Zoölogical Museum of Christiania, and three years later full curator of that institution. His country, too, was quick to recognize the marked value of his first contributions to the literature of zoölogical science, and, as his various works were published — chiefly on the Norwegian fauna — honors, in the way of medals and degrees, were frequently bestowed upon him.

He became Director of the Zoölogical Museum of Christiania in 1882, and two years thereafter Professor of Zoölogy at the University.

Collett's first published paper dealt with the avifauna of the region in which the city of Christiania is situated, and this, as time went on, was followed by numerous and substantial contributions to almost every department of zoölogy, including the science of morphology. One of his best known achievements in the latter direction was a monograph upon the structure of the external parts of the ears of the *Strigida*. Professor Collett also gave us a number of excellent popular works upon Norwegian ornithology, and was a constant contributor to the zoölogical periodicals of his own and other countries.

Prof. Collett built up a superb and well stocked museum at Norway's capital. He published only recently an elegant volume on the Mammalia of his country, and at the time of his death was engaged upon the Reptilia; indeed, it was his intention to so treat the entire vertebrate fauna of Norway.— R. W. S.

IN the death of Chester A. Reed of Worcester, Mass., on December 16, 1912, the Union lost an Associate of much promise. While only thirty-six years of age Mr. Reed had already attained a wide reputation by his publications on popular bird study. He early conceived the idea that colored illustrations were the surest means of obtaining a familiarity with birds and in all his works, the furnishing of adequate illustrations was the chief aim.

In the use both of the camera and the brush he had acquired great skill and his efforts have contributed not a little to the spread of the popular knowledge of bird life which has marked the past few years. His most notable publications have been his 'Bird Guide'; 'Flower Guide'; 'North American Birds' Eggs'; 'Birds of Eastern North America'; 'Nature Studies in Field and Wood'; and 'Camera Studies of Wild Birds.'

WILLIAM BERNHARD TEGETMEIER, the English ornithologist, died on November 20, 1912, at the age of 96 years. He was born in Buckinghamshire, November 4, 1816, and was noted for his investigations on the breeding of Pigeons, Poultry and Pheasants. He was a correspondent of Darwin and furnished him with much information derived from his experiments in breeding and variation.

At the 30th annual meeting of the American Ornithologists' Union, held in Cambridge, Mass., November 11, 1912, it was voted to publish an index to the volumes of 'The Auk' from 1901-1910, inclusive, and the appointment of a committee to undertake the work was authorized. The President has appointed Dr. T. S. Palmer as Chairman with authority to select the members of the committee. Dr. Palmer informs us that the Index Committee as at present organized comprises:

Dr. T. S. Palmer, Chairman; Prof. W. W. Cooke, Secretary; Dr. A. K. Fisher, N. Hollister, A. B. Howell, A. H. Howell, D. E. Lantz, H. H. T. Jackson, W. L. McAtee, Gerrit S. Miller, Jr., E. A. Preble, J. H. Riley, and John G. Tyler. The work, he states, has been divided so that ten of the members will do the actual indexing and the other three will prepare the copy for the press. The plan of this index is the same as that of the 25-year index published in 1907. It is expected that the same high standard of completeness and accuracy will be maintained and with much less labor than was necessary in the preparation of the larger work. The Biological Survey already has the material for a 10-year index on cards prepared by Prof. Cooke. These cards have been divided among the indexers, the entries for one volume being given each member to check with the text and make any necessary additions or corrections. The cards are then to be returned to the secretary who will rearrange them in a single alphabet and prepare the final copy for the printer. This copy will then be divided into 10 equal parts and given to the indexers a second time before being sent to press. In this way much of the arduous labor of writing cards can be avoided and the entries checked twice with a minimum of effort.

The work is already well under way and one fourth of the cards have been returned to the secretary. It is expected that all will be returned by May 1 and that the final copy can be prepared, verified, and made ready for the press before the next annual meeting.

An editorial in a recent number of the 'Wilson Bulletin' contemplates the organization of an Ornithological Society — or rather the extension of the existing Wilson Club — to cover the Interior states and to hold annual meetings for the purpose of bringing the members into close personal touch. It seems to us that such a movement cannot be too strongly commended, the one weak point in the organization of the Wilson Club has always seemed to be this lack of personal contact, which is all important in stimulating ornithological activity.

The geographic arrangement of Ornithological Societies mentioned in the closing paragraph does not, however, seem to us a very happy one, *i. e.* "The Cooper Club on the Pacific side, the A. O. U. on the Atlantic, and the Wilson Club in the Interior." The A. O. U. is in no sense local in its activities and it draws its strength from the Pacific and Interior states as well as from the Atlantic coast. The holding of its meetings in the east has been because the great majority of active ornithologists are located there and almost all the invitations for holding the annual meetings have come from eastern cities. Moreover the burden imposed upon the local members on such occasions is unfortunately considerable and makes it difficult to entertain the Union except in cities where there are a large number of resident members.

A better grouping would we think be: "The Cooper Club on the Pacific side, the Wilson Club in the Interior and the Nuttall and Delaware Valley Clubs in the east; with the A. O. U. covering all three districts and meeting now in one and now in another, according to the invitations received and the number of active ornithologists who could be guaranteed to be in attendance. For some time to come the A. O. U. meetings will probably be held mainly in the east for the reasons already cited, but the proposed activity of the Wilson Club would we feel sure, soon result in invitations to meet somewhere in the interior which would, we have no doubt, be promptly accepted. The Cooper Club has already successfully managed one A. O. U. meeting on 'the coast' and bids fair to duplicate it in the near future.

Meanwhile an Annual meeting of the Wilson Club will undoubtedly draw the ornithologists of the interior states into close association and, if held at a time other than that of the A. O. U. meeting will ensure them an opportunity for personal contact without conflicting with the more general gathering. The movement will also concentrate their energies and resources so that an A. O. U. meeting in one of the Interior states will we trust, be an event of the near future.

MESSRS. F. M. Chapman and Louis Agassiz Fuertes with four assistants, sailed for Colombia on January 8, to continue their explorations of the avifauna of that country in the interests of the American Museum of Natural History. They expect to make collections in the vicinity of Bogota and then cross the mountains to the east and descend into the headwaters of the Orinoco, thus connecting their previous work in western Colombia with that now being prosecuted by another party in the Orinoco drainage, and making as it were an ornithological cross section of the country.

UNUSUAL activity in game legislation has been manifest this winter and Dr. T. S. Palmer of the U. S. Biological Survey has sent us the following summary of this work:— Since the beginning of the year Congress and the legislatures of 41 States have been in session, and the total number of game bills under consideration is probably between 400 and 500. The average of 10 such bills per State is reduced to one in some cases and in others as in Connecticut increased to nearly 60, and in California to 93. The fate of many of these measures is still uncertain. At this date, March 15, Congress and the legislatures of Indiana, Oregon, South Carolina, South Dakota, Vermont, West Virginia, and Wyoming have adjourned and their record is closed.

The great event of the year is the passage of the Federal migratory bird bill as an amendment to the Agricultural Appropriation bill on the last day of the session. This measure has been before Congress for more than eight years, and during the past year a campaign for its enactment unequalled in the history of game legislation has been waged by the American Game Protective Association, the National Association of Audubon Societies, and other friends of wild life conservation. As finally enacted it differs but slightly from the bill originally introduced by Hon. George Shiras, 3d, in December, 1904, and authorizes the Department of Agriculture to fix seasons for migratory game and insectivorous birds, and imposes a maximum penalty of \$100 fine or 90 days imprisonment for killing such birds out of season. On March 3, the day before his retirement, President Taft signed an order making the Aleutian Islands, Alaska, a reservation in charge of the Departments of Agriculture and Commerce. This reservation, the 61st in the list of National Bird Refuges and one of the largest, includes all the islands from Unimak west to Attu. Congress has been preparing for new tariff legislation and during the hearings before the Ways and Means Committee of the House on January 30, Dr. W. T. Hornaday, representing the New York Zoological Society, Mr. T. Gilbert Pearson, Secretary of the National Association of Audubon Societies, and Dr. George W. Field, Chairman of the Massachusetts Fish and Game Commission, urged the amendment of Schedule N so as to prohibit the importation into the United States of the plumage of wild birds. The result of their efforts is still uncertain as the bill will not be reported until the special session in April.

In the State legislatures plumage bills similar to the New York Shea

law have been introduced in Indiana and Pennsylvania (S. 46) and have passed one branch of the legislature with a fair chance of enactment in spite of the active opposition of the millinery interests. Among other measures of special interest to ornithologists may be mentioned the Tennessee law removing the Robin from the game list, the Pennsylvania bill (S. 45) protecting the Dove, Killdeer and Blackbird throughout the year which had passed, the California bill placing Wild pigeons, Doves, and all *Limicolæ* on the nongame list (S. 1190), the bills in Connecticut (H. 222) and New Jersey (A. 206) removing protection from the Starling, and the effort in Connecticut to restore the provision for issuing permits for scientific collecting. Oregon has established several important State game preserves and revised her entire game law, Vermont has likewise adopted an entirely new game code, and Wyoming has stopped spring shooting of ducks and geese (S. F. 11).

The usual number of bills permitting spring shooting has been introduced especially in Connecticut, New York, and Colorado, but in Wisconsin the measure met a decisive defeat in the Assembly Committee. Texas is considering the withdrawal of protection from pelicans and certain other fish-eating birds. Connecticut, Massachusetts, Michigan, Ohio, and South Dakota are struggling with the question of reorganization of their game departments, and California has under consideration several freak bills, one of which (A. 287) proposes to divide the State into 58 game districts, one for each county, and another (A. 1992) to make every member of the legislature a game warden who shall serve without compensation.

WE learn from the Press Bulletin of the Canadian Department of Mines that the Victoria Memorial Museum has just received a fine collection of several hundred Canadian birds, the gift of Mr. J. H. Fleming. The specimens are said to constitute one of the best mounted collections in Canada.

A CIRCULAR issued by the editor of 'British Birds' states that the readers of this magazine have placed over 32,000 rings on wild birds of various kinds. The most striking of the numerous 'return records' that have been received is that of a Swallow, banded by Mr. J. R. B. Masefield at Rosehill Cheadle, Staffordshire, England, May 6, 1911, and found near Utrecht, Natal, South Africa, on December 23, 1912.

AT the annual meeting of the Royal Australasian Ornithologists' Union the Check List Committee, which has for some years been engaged in preparing a list of Australian birds, presented its report. The facts that trinomials are rejected, and that the principle of priority is not carried farther back than the dates contained in the works of John Gould, will demonstrate how absolutely this list will differ from the recent list published by Mr. Gregory M. Mathews.

We fear that Australian Ornithologists are not advancing the interests

of systematic ornithology by adopting such rules as the above. We are already seeing evidence of the dilemma in which the rejection of trinomials has placed them, when we find in their latest publications some new binomial names denoted as species and others as subspecies! The publication of the Check List will be looked forward to with much interest.

THE twenty-third annual meeting of the Delaware Valley Ornithological Club was held at the Academy of Natural Sciences, Philadelphia, on January 2, 1913. The officers elected for the ensuing year were: President, Stewardson Brown; Vice-President, Henry W. Fowler; Secretary, J. Fletcher Street and Treasurer, Samuel C. Palmer; Robert T. Moore continues as editor of *Cassinia*.

Some of the more important communications presented before the Club during the year were: A Trip to the Magdalen Islands, by W. L. Baily; A Trip to Ecuador with Special Reference to the Tierra Templada, by Samuel N. Rhoads; The Classification of Birds, by Spencer Trotter, M. D.; Summer Birds of McKenzie Pond, Adirondaeks, by E. L. Poole; and The Embryology of a Bird, by Samuel C. Palmer.

THE J. P. Bell Co., Lynchburg, Va., announces the early publication of a work on 'The Breeding Birds of Virginia,' by Mr. Harold H. Bailey. The volume will comprise about 300 pages of text with 14 colored plates and one hundred half-tones. The edition will be limited and orders should be sent to H. H. Bailey, Newport News, Va., Price, exclusive of postage \$3.

MESSRS. WITHERBY & Co. are shortly publishing for Mr. H. Kirke Swann 'A Dictionary of English and Folk-Names of British Birds,' which will contain some five thousand names with their meanings and localities as well as much information on the Folk-Lore, Weather-Lore, and Legends connected with birds.

JUST as we go to press we have received a copy of Mr. Robert Ridgway's long expected Color Book under the title 'Color Standards and Color Nomenclature.' Washington, D. C. Published by the Author. \$8. (cash with order), postage extra, registered 20 cts.

The work consists of forty-three pages of text and fifty-three colored plates depicting 1115 named colors! Besides furnishing an indispensable standard of colors for naturalists and others who have to deal with fine gradations of tints it constitutes a thoroughly scientific presentation of the entire subject of colors and their relationship.

DR. J. A. ALLEN of the American Museum of Natural History, formerly editor of 'The Auk,' sailed for Europe last month as one of the American delegates to the Ninth International Zoological Congress, to be held at

Monaco, March 25-29. One of the most important questions likely to be brought before the Congress for discussion, and one in which Dr. Allen is deeply interested, is the proposition to depart from the rule of absolute priority in regard to generic and specific names. We trust that no change in the rules bearing upon this matter will be authorized and that the painstaking work of the Commission toward a uniform standard nomenclature may be allowed to proceed unhampered.

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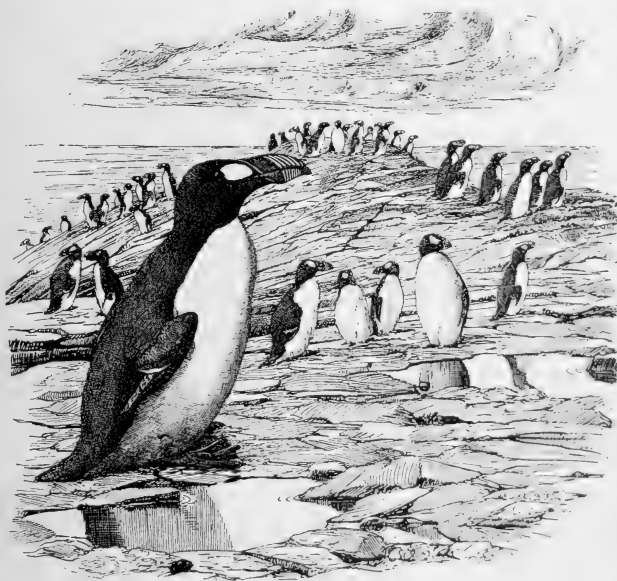
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Vol. XXX

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Manuscripts for general articles should reach the editor at least six weeks before the date of the number for which they are intended, and manuscripts for 'General Notes' and 'Recent Literature' not later than the first of the month preceding the date of the number in which it is desired they shall appear.





Will. Bartram

From Welch's Engraving of the Portrait by Peale.

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JULY, 1913.

No. 3

BIRD MIGRATION RECORDS OF WILLIAM BARTRAM.

1802-1822.

BY WITMER STONE.

Plates IX, X, and XI.

THERE is preserved in the library of the Academy of Natural Sciences of Philadelphia a well worn manuscript volume with pages about four by six inches and a pasteboard cover upon which is inscribed in almost illegible characters "Calendar of Natural History, Memorable Events &c" while page one bears the heading "Calendar for the Year of our Lord 1802."

There follows a daily record of the state of the weather, the blooming of plants and trees and the appearance of birds, insects and other forms of animal life, after the manner of Gilbert White's Calendar in his Natural History of Selborne.

An insert informs us that this is the manuscript diary of William Bartram during the years 1802 to 1822, kept at the old Bartram homestead on the Schuylkill in Kingsessing, now a part of the city of Philadelphia, though at that time several miles out in the country.

The Bartram place established by John Bartram, father of William, and like him a famous botanist, is now preserved as a city park under the name of Bartram's Garden. Here one can still see the old house built by the elder Bartram with his own hands, and can walk along the box-bordered paths and admire the various trees, shrubs and herbs brought by the Bartrams from various

parts of the Middle and Southern states, or raised from seeds obtained in exchange from more remote countries.¹

What is more interesting to the ornithologist is the fact that to this same garden came Alexander Wilson the Scottish schoolmaster, from his little county school house which stood near by, and largely under the influence of William Bartram and the famous garden, he developed into Alexander Wilson the American Ornithologist.

The diary begins with the very year that Wilson came to Kingessing and had Bartram only seen fit to record his impressions of the young schoolmaster and his subsequent activities, what an historical storehouse this little volume would be! He kept it strictly a 'Calendar of Nature' however, and so far as we can gather from its pages such a man as Alexander Wilson might never have lived.

But there is a mine of information in these closely written pages and the data on bird migration constitute, we believe, the oldest record, covering a series of years, that we have for any part of North America. The record is by no means complete and every year one or more common birds are omitted, while we must remember that Bartram was familiar with only a portion of our native birds and made no pretense of being an 'ornithologist.'

The diary is not continuous and the writer, like many another keeper of journals found that it was easier to start on New Year's than it was to continue the record day after day. It runs from January 1, 1802 to September 20, 1808 missing here and there a few days or once or twice as much as a month, and always more detailed in winter and spring than later in the year. Then there is a gap until January 1, 1814 and another from February 13, 1814 to January 1, 1818, from which point it continues until December 31, 1822, about seven months before the death of the writer, whose increasing feebleness is reflected in the wavering lines of the handwriting. Eleven spring seasons are thus included, but only the most familiar birds are noted every year. Bartram was sixty-three years of age at the opening of the calendar and eighty-four

¹ cf. William Bartram, By George Spencer Morris. 'Cassinia', 1906, p. 1. The illustrations used in this biographical sketch are reproduced in 'The Auk' through the courtesy of the Delaware Valley Ornithological Club.

at the close, but his constant out door life and the favorable situation of the gardens offset any lack of ability due to age and make it probable that he recorded the common species as soon as they came about his house.

I have recently read the journal through and have copied out every reference to birds. These I have arranged systematically and now through the courtesy of Dr. Edward J. Nolan, librarian of the Academy of Natural Sciences of Philadelphia, I am able to present them to the readers of 'The Auk' with such comments as seem pertinent.

As these data, separated from the botanical and meteorological information with which they were originally associated, give one no idea of the character of the daily entries, I have reproduced verbatim the greater part of the record for January, 1802, and the more important zoological data for the remainder of that year.

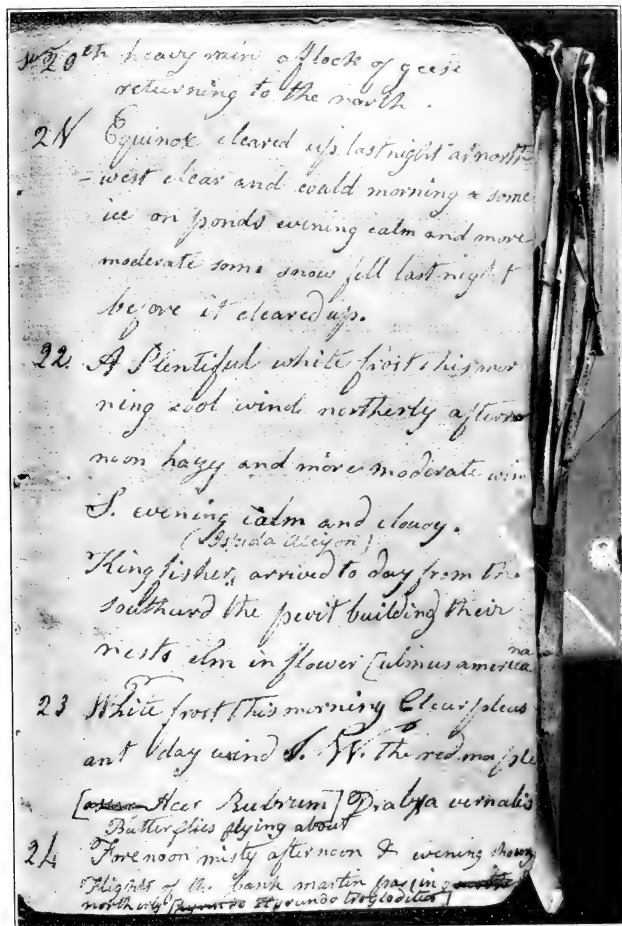
From these the reader will be brought into sympathy with the writer and will be enabled to picture the gentle old man, looking after his farm and pottering about his beautiful garden on the river shore and each evening by candle light jotting down in his little book the events of the day that stood out most prominently in his simple life.

Following this will be found the systematic compilation of bird migration data and a comparison of the average dates of arrival for certain species with the average dates of arrival at Philadelphia one hundred years later.

CALENDAR FOR THE YEAR OF OUR LORD 1802.

- Jan'y. 1. The weather serene and as warm as in the month of May after a white frost in the morning. The fields and gardings green with growing vegetables, several species in flower and abundance of insects darting in the air and birds singing as in the spring of the year, frogs lively in the springs. Wind south east.
2. Slight white frost, the day exceedingly warm and pleasant as yesterday, Wind S. W. Spiders darting their webs wasps flying about (*Vespa anularis*) the blewbird sings (*Motacilla Sialis*). Evening calm and warm.

- 5 Slight frost this morning, midday warm, wind Northerly evening calm and serene, wind S. W. Mockbird Not yet left us on his passage to the south (*Turdus polyglottos*)
- 6 White frost this morning and some ice but midday very warm and pleasant. Afternoon cloudy evening hazy, warm and thawy, wind E. Birds numerous, Snow Birds, sparrows, woodpeckers, golden crowned ren, titmice (*parus atricapillus*, *P. cristatus*) Nut hatch (*Sitta canadensis*), Crows numerous, Hawks of various species. Blue bird, Robins (*Turdus migratorius*) and an endless variety of insects
- 7 Last night plentiful showers of rain, air warm, cleared up in the afternoon, the wind S. W. evening serene and warm. Frogs whistle, the sparrow hawk scream (*Falco sparverius*).
- 11 Clear with high westerly winds and pritty coald, the wind setted at the north west with strong winds & very coald.
- 15 Clear and warm as May day, no ice to be seen in the river, the bees out till evening flying about. Sparrow hawk & Blew bird. Crocus verna, Narcissus, snow-drops, Tulip Above ground. Hamamelis is full bloom. Wind S. W.
- 17 Some frost this morning moderately cool but pleasant all the day, evening hazy, wind southwardly Ducks on Schoulskill
- 19 A Beautiful white frost this morning, a fine clear warm day, the river Schuykill exhibits very little signs of winter and the corn fields green as in the month of may. Wind S. W.
- 23 Chilly and cloudy Cleared up before sunset evening serene moderately cool, wind N. E. Blue birds, Fringilla Tristis (Yellow Bird), Fringilla Purpurea (Purple finch)
- 25 Coald and freesing, some snow Seen to fall tho the wind was S., cleared up before sunset, the wind N. W., evening serene and cool. the owl screamed last night.



A PAGE OF THE BARTRAM 'CALENDAR.'

- 27 Large flights of Crows to the southward (*Corvus frugivorus*)
- 31 Clear pleasant and moderate weather, no frost, the fields and pasture green as in the spring. Grass and grain growing night and day. Spring Aconite (*heleborus*) in flower in the garden. Large flocks of ducks in the river Schuilkill. The face of the earth exhibits more the appearance of spring than winter

- February
- 1 A large flight of blew birds past by from the southward.
 - 2. Seeds of vegetables vegetate in the garden such as radish, larkspur and many other kinds; many in flower as primula, Daphne, mezrium &c
 - 10 Bees are out of the hives seeking for flowers
 - 14 A small flock of red-wings (*Oriolus phoenicia*), the Blew birds begin to pair
 - 15 Peach buds swell
 - 16 Wood Cock (*Scolopax rufa*) Arrived from the southard Filbert in flower.
 - 17. The ground Squirrel came out of their winter quarters frisking about in the warm sun. The Crow Blackbird (*Gracula Barita*) arrived from the southard The alder in blossom
 - 21. A fine warm day. large flights of red wings. People swimming the Schuilkill afternoon
 - 22. Began to snow this morning before light and continued increasing all day the air extremely cold.
 - 23 Blue Birds flying about

- March
- 2. Flights of red-wing passing from the southard and flocks of Cedarbirds.
 - 3. Flights of Redwings and ducks passing from the southard
 - 5. Wild Geese passing northerly.
 - 10 The Killdear (*Charadrius vociferus*); Dwarf Dafodill and snowdrops in flower
 - 11 Spring frogs whistle, flocks of various kinds of ducks in Schuilkill from the southard.

- 12 The crossbill passing Northerly.
 15. Blew birds build their nests.
 16. Sun set very red last night. *Crocus verna* in full flower; shad frog.
 17. Flocks of Birds of Passag flying northerly.
 18. Smoky sun, warm growing weather. Pewit and Cowpen bird arrived from the south ward. Wind S.
 20. Heavy rain, a flock of geese returning to the north.
 22. Kingfisher (*Ispida alcyon*) arrived today from the southard, the pewit building their nests; elm in flower (*ulmus americana*)
 - 23 The red maple (*Acer Rubrum*), *Draba vernalis* in flower. Butterflies flying about
 - 24 Flights of the bank martin passing morthery (*Hyrundo trogloditus*)
 26. Snow lies three inches deep and the trees loaded with it
 27. Most of the snow disappeared
 30. Turtle Dove Cooing (*Columba Carolinaensis*)
 31. Cloudy, warm growing weather. Spice Wood (*Laurus Benzoin*), Rock Saxifrage (*Saxifraga rupestris*), Rock Cress (*Arabis lyrata*), Skunk Cabage (*Dracontium foetidum*) in flower. This last plant has been in flower five or six weeks.
- April 2 The little grey fly-catcher (*Muscicapa grisea*) arrived from the Southward. The Aspen tree *Populus heterophylla* in flower. The glow worm sparkle in the grass
4. Peach trees beginning to bloom
 - 7 The house swallow arrived (*hirundo domestica*)
 11. Fox-coloured thrush (*turdus rufus*) arrived
 12. Fishing hawk (*Falco piscatorius*) and Woodthrush (*Turdus minor*) arrived from the south.
 13. Blue Violet and *Claytonia virginica* in flower
 - 14 The turtle Dove Coos (*Columba carolinensis*)
 15. Quaw bird (*Ardea Nycticorax*) arrived
 17. Ice seen this morning. Peaches and cherries suffered by the frost last night
 19. Chewink (*Fringilla Erythropalma*), Pine creeper (*Parus pinus*), arrived. Wild Tulips (*Erythronium*), *Viola*

- pedata, Anamone nemorosa. Least wood Thrush (Turdus trogladitus)
- 20 White frost this morning. Sasafrass in flower. Yellow Butterfly (Pappillio)
21. A little white frost this morning. Warm pleasant Day Garden Ren (Motasilla familiaris), Summer Yellow Bird Motasilla estivalis. Plumbs, Currrens, Rasperrys full in Bloom. Aplles beginning to flower. Sweet firn, Liquidamber perigrinum in bloom and swarming with bees sucking honey from the flowers
22. Cat Bird. (Lucar.)
- 25 Wipoor will (Caprimulgus Virginica) arrived.
- 26 Maryland Yellow-throat, (Motasilla —) the little olive Coloured warbler (Motasilla olivacia). Tree frog Rana —.
- 28 Hanging bird, (Oryolus Baltimora) & O. spuria hummingbird (Trochilus colubris). Lylac (Syringa communis) Water leaf (Orontium aquaticum)
29. Elm seed ripe
- May 2. Redstart (Motasilla rutasilla).
 The Apple tree in full flower. The borer Bee out visiting thee flowers.
3. Read head (Picus eriocephalus), Chimney Swallow (Hirundo pelagia), May Bird (Alauda calandra), Marsh Sparrow (Fringilla palustris) Arrived. Rye in ears, Dogwood (Cornus florida). Tumble turf (Scarabius) and Several species of Butterflies
4. Yellow-breasted chat (Motesilla trochilus). A great variety of small birds of the genus of Motacilla and Parus. Nearly all the Summer passerger birds Arrived.
5. A Bull frog swallowed a large mole instantly
6. Male rice bird (Emberiza oryzivora) arived
7. Blew linnet (Emberiza cyanea) Arrived. Various species of the Dragonfly (Libellula). Wasp begin to build their nests.
9. Crested flycatcher (Muscicapa Crinita)
- 20 Cool for the season. this has been heatherto the coolest spring, the work of vegetation almost suspended,

esculent vines such as cucumbers, mellons, squashes etc that have come up are mostly destroyed by the cool rains and chilling air and all other kitchen Garden vegetables much injured by the Coald.

21. The lightning fly sparkles in the night (Cantharus —)
 22. Ardea virescens, Green bittern, Muscicapa rapax wood pewit arrived. Wheat just begining to ear appears to be blasted in many instances, young birds drownded in their nest on the ground by the heavy rains.
 27. Cool. The fire-side is agreable morning and evening.
 31. Early cherries and strawberries begining to ripen young birds leave their nests such as blue birds, robins, crow blackbirds.
- June 22. Warmest day that we have had this summer
- 29 A male bird of Loxia Oryzivora found dead under a tree about five mile from philadelphia, supposed to have escaped from a cage Grain harvest has begun
 30. A luminous Northern light this evening. (Aurora borealis)
- July 9. Morning clear and cool, evening cool enough to sit comfortably by the fireside
21. Apples ripe. Oat harvest. Some cases of yellow fever in the city.
 23. Liliun superbum in flower we have a plant now in the Garden the stem of which is upwards of eleven feet high terminating in a pyramed, at top composed of 32 perfect Flowers and exhibits a truly superb spectacle.
 25. Sow Buckwheat. Whistling Cricket (Tetigonia) in the Evening and Night. Cicada.
 - 28 Fire Flies abundant.
- August 7. Malignous Fever rages in Philadelphia and Baltimore, The inhabitants on recommendation of the Board of Health are moving out onto the Country.
- September 6. Whip-or-will crys this evening they are now on their passage to the South.
- [lapse until Dec. 1.]
- December 2. MockingBird yet with us feeding on Smilax berries
4. Heavy white frost some Ice Mockbird.

11. Cold and frosty. Butcher Bird.
13. Schuylkill scaled over with Ice. Yet *Picus auratus*, Yellow Rump, Blue Bird, Butcher Bird and Mock Bird are with us.
15. Clear and cold. Mock bird, Yellow Rump, Robbins, and Blue Birds
18. Slight fall of snow. *Picus auratus*, Butcher Bird
20. Rained all night Mock-Bird
22. *Ampelis* feeding on Fruit of *Celtis*, *Juniperus* and *Diosperus*
24. Evening serene and calm A very small Owl was caught having no horns, (*capitæ laevi*) not much exceeding the size of a sparrow much like one Figured by Edwards a native of Hudson's Bay.
25. Morning clear. Schuylkill scaled-over with Ice surface of the earth white with hoar frost. serene & warm all day evening calm & moderate wind southerly.
26. Cloudy and moderate. Bluebird
30. Drizzling day. Some Snow about noon but soon turned to Rain
31. Cleared last night. Morning cool. Blue Bird Butcher Bird, *Fringilla tristis*, *Regulus cristatus*. No Ice in Schuylkill. Wasps flying. Moles throw up the Earth. Frogs in springy places. *Dracontium foetidum* above ground.

SYSTEMATIC LIST OF BIRD NOTES.

Larus argentatus. HERRING GULL.

Gulls are still frequent on the river in winter as far as Bartram's Garden and must have been plentiful in his time. He apparently only thought of mentioning them when compiling a particularly full winter list, or at an unusually late date. These are the only records:

1821. February 19. Sea gulls from south passing to the north.
 April 11. Gulls.
 1822. February 22. Sea gulls.

Sterna hirundo. COMMON TERN?

1822. April 11. Rain showers all night, cleared this morning, blustery Terns.

Anatidae spp. DUCKS.

Nowhere, perhaps, is the difference in bird-life one hundred years ago more noticeable than in comparing Bartram's notes on the abundance of ducks to be seen on the river, with the scattering individuals that now venture to stop there. We find the following spring records:

1802. January 17. Ducks in Schoulskill. Pleasant day wind S.
 " 31. Large flights of Ducks in the river.
 March 3. Flights of Ducks passing from the southard showery all day and warm, wind S.
 " 11. Flocks of various kinds of Ducks in Schuilkil from the southard. Pleasant forenoon succeeded by wind.
 1803. February 2. Several sorts of Ducks arrived from the South on their return to the North viz: *Anas nigra*, *A. boschas*, *Mergus merganser*. Foggy and drizzling, changed about noon with rain from the south.
 " 23. Green-winged Teal passing to the North. clear pleasant warm day wind S.
 " 28. Flocks of Ducks passing northward. Ice on ponds. After sunrise became cloudy and thawy. Evening cloudy and warm; like for rain. Wind S. E.
 March 4. Great numbers of Ducks in Schuylkill from the south. Warm pleasant day, wind S.
 " 14. Ducks passing northerly. Morning cloudy and misty, cleared about noon.
 1804. February 12. Ducks arrive from the south. Pleasant warm day. Wind S. W.
 " 19. Black Duck arrived from the south on their passage or return to the north. Warm pleasant spring weather.
 " 21. Blue-winged & Green-winged Teal migrating north on their return to breed. Clear pleasant weather. Wind S.
 " 27. Flocks of Ducks in Schuylkill arrived from the south. Morning clear and cold, afternoon hazy, and thawy wind S. W. Ice driving with the tide.
 " 29. Ducks from the south. Hazy, warm, thawing weather. Wind S. W.
 April 17. Flocks of Ducks returning from the north. Cool, rain, wind high N. E.
 1805. February 23. Large flights of Ducks. Warm and pleasant Wind S.¹

¹ There is much irregularity in the fullness of the record and the meagre mention of ducks in some years does not, I feel sure, indicate their scarcity.

1806. March 30. Ducks and Teal arrived from the south. Wind S. Some Ice on ponds this morning. Noon and evening warm and delightful. Peach nearly in bloom as also Elm and Maple.
1818. January 27. A few fishing Ducks. Wind N. E. a little thawy, Schuylkill clear of Ice.
- March 9. Ducks arrived from S. Pleasant moderate day.
- " 13. Teal from the south passing northerly. Warm as May, wind S. Snowdrops. This evening the spring and shad Frogs.
1819. March 26. Ducks. Forenoon clear fine spring weather, Wind S.
- " 31. Ducks passing Northerly. Cold blustering day. Wind N. W.
1820. March 27. Ducks passing northerly. Warm growing weather. Land frog chatters.
1821. February 10. Teal passing northerly. Cloudy. Wind W.
- " 19. Ducks from the south passing to the north. Pleasant warm day. Wind S.
1822. February 22. Ducks from the south. Clear moderate, wind N. W.

Autumn duck records are few and I find only the following:

1804. October 3. Several kinds of Ducks pass. Clear and pleasant, wind S. W.
- " 24. Cloudy, showery about noon, cleared afternoon, wind N. Soon after great flight of Ducks passing southward.
1818. August 24. Blue-wing Teal. Morning clear and cold Wind N. W. Evening cloudy & rain.

Branta canadensis canadensis. CANADA GOOSE.

1802. March 5. Wild Geese passing Northerly.
- " 20. A flock of Geese returning to the north.
1803. March 14. Some Wild Geese have passed.
- " 30. Wild Geese passing northerly all Day.
1804. March 17. Flocks of Geese flying to the north.
- " 21. Geese passing northward.
1805. March 8 and 17. Flocks of Geese pass by to north.
1807. April 16. Large flights of Geese passing northerly.
1808. March 8. Geese from southward.
- " 16. Flocks of Geese pass by from So. in morning.
1814. February 13. Wild Geese (*Anser canadensis*) pass northerly.
1819. March 26, 31 and April 10. Geese passing northerly.
1820. March 27. Geese passing northerly.
1821. April 21. Large flights of Geese passing North.
1822. March 15. Flights of Geese passing to the north.

The autumnal records are as follows:

1804. October 20. Flocks of Geese pass south.
 " 24. Great flight of Geese passing southward.
 1805. October 6. Geese pass to the South.
 November 8 and 10. Flocks of Geese pass by.
 1807. October 17. Wild Geese passing southerly.
 1818. November 27. Flights of Wild Geese passing southerly.
 1820. October 25. Wild Geese pass southerly.

Branta bernicla glaucogaster. BRANT.

One record on April 16, 1820 'Brant Geese passing northerly.'

Chen hyperboreus nivalis. GREATER SNOW GOOSE.

1807. April 15. Pleasant, clear Forenoon, wind S. which bro't a large Flight of white Brant Geese & a pair of Ravens. The former pass on to the north, the latter westward. Afternoon & evening wind N. No fruit trees yet in bloom. Cornel Tree in blossom.

Ardea herodias herodias. GREAT BLUE HERON.

Only mentioned once:

1803. April 14. *Ardea Herodias* arrived. Misty, sun appeared 2 or 3 hours about Midday red as blood through dry mist or Smoke.

Butorides virescens virescens. GREEN HERON.

Entered as 'Green Bittern' or as '*Ardea virescens*,' arriving on the following dates:

- | | |
|-----------------|-----------------|
| 1802. May 22. | 1807. April 20. |
| 1805. May 4. | 1822. May 4. |
| 1806. April 28. | |

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.

Always entered as the 'Quaw-bird' usually with '*Ardea Nycticorax*' added. Arrived:

- | | |
|-----------------|-----------------|
| 1802. April 15. | 1820. April 13. |
| 1803. April 7. | 1822. May 4. |
| 1805. April 23. | |

Philohela minor. WOODCOCK.

The records of what was then evidently a very common species are as follows:

1802. February 16. Wood Cock (*Scolopax rufa*) arrived from the southard.

1803. March 11. Wood Cock (*Scolopax rufa*) arived. Spring
Frog whistles.
" 14. Wood Cock pair.
November 28 and December 26. Woodcock.
1804. September 20. Woodcock yet with us. Equinox.
" 26. Woodcock yet with us.
1805. March 18. Wood Cock pair.
1807. March 16. Wood Cock (*Scolopax*) arived.
1818. March 13. Woodcock screeps this evening.
1819. March 6. Woodcock this evening.
" 20. Woodcock whistles. The earth covered with
snow this morning but all melted before night.
- October 8. Woodcock.
1822. March 8. Woodcock arived.

Gallinago delicata. WILSON'S SNIPE.

Only twice mentioned

1803. March 7. Meadow Snipe (*Scolopax minor s. arvensis*). Snow
this morning, cloudy and chilly all day.
1807. April 7. Meadow Snipe arived. Pleasant spring weather.
Rock Saxifrage & Hepatica in flower.

Actitis macularia. SPOTTED SANDPIPER.

Arrival recorded three years of '*Tringa macularia*'.

1805. April 14. 1820. April 24.
1818. April 17.

Bartramia longicauda. UPLAND PLOVER.

Only mentioned once. Though he used the common vernacular name, the use of the word *Tringa* shows that he understood its true affinities.

1818. May 10. Wistling Plover (*Tringa*) arived.

Oxyechus vociferus. KILLDEER.

The records simply mention the arrival of the 'Killdeer', 'Kildear' or '*Charadrus vociferus*'.

1802. March 10. 1818. February 18.
1803. March 11. 1820. February 17.
1805. February 24. 1821. March 1.
1807. February 22. 1822. March 8.

Limicolae. OTHER SHORE-BIRDS.

1819. April 18. Tringas and Plovers arived.
1822. April 11. Tringa passing northerly.

Colinus virginianus virginianus. BOB-WHITE.

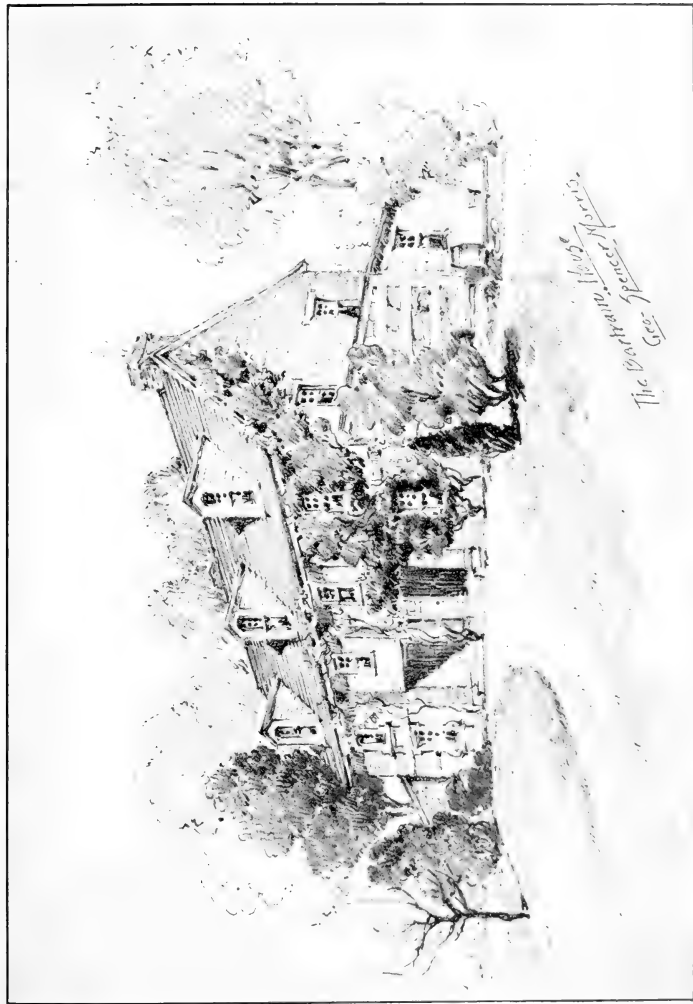
1803. January 9. Partredges.
August 15. Partredge resumes their Winter language.
1804. January 28. Partredges call *Ho-oi-hee*.
February 11. Partredges.
1818. January 17. Partredge. Our Partredge migrates southerly at commencement of winter, but yet abundance remain with us, perhaps northern broods.
1822. May 4. Partredge (*Tetrao marlandica*).

Ectopistes migratorius. PASSENGER PIGEON.

This bird is recorded in but three of the years covered by the Journal. Whether like some other species it seemed to the writer too common to merit mention except when it occurred in unusual numbers, or whether the records given constitute the only occasion when the birds occurred near the garden, I cannot say. Wilson writing at this very period states that, "Every spring as well as fall more or less of them are seen in the neighborhood of Philadelphia, but it is only once in several years that they appear in such formidable bodies, and this commonly when the snows are heavy to the north, the winter here more than usually mild, and acorns, &c., abundant."

Bartram's records are as follows:

1803. March 16. Clear warm day, Alder in flower. Large flights of Wild Pidgeons.
- September 11. Wild Pidgeons arived from North Clear & dry, wind southerly. Poke berries & wild Grapes ripe.
1804. January 7. Wild Pidgeons in the Forest feeding on Acorn. The day warm as summer, evening cloudy.
- February 19. Large Flights of Wild Pidgeons (*Columba migratoria*). Warm, pleasant, spring weather, seeds vegetate in open ground.
- March 1. Pidgeons flying northerly. Cloudy morning, began to snow about 11 o'clock. Every appearance & feeling of winter.
- " 13. Pidgeons in flocks. Rainy day cleared at evening.
- April 8. Flights of Pidgeons. Cool, flying clouds from N. W.
- April 22. Flocks of Pidgeons flying northerly Cloudy & warm, wind S. River Schuylkill overflowing, the rapid waters carry along Bridges, rafts, & timber swept from the shores.
1807. January 9. Wild Pidgeons flying in flocks clear & cool.
- February 10. A flight of Pidgeons passt. by Northerly. Cloudy and thawy, evening tempestuous with rain.



THE BARTRAM HOUSE, BARTRAM'S GARDEN, PHILADELPHIA.
From a sketch by George Spencer Morris.

Zenaidura macroura carolinensis. MOURNING DOVE.

1802. March 30. Turtle Dove Cooing (*Columba carolinaensis*).

April 14. The Turtle Dove Coos (*Columba caroliniensis*).

It is then recorded as present: 1803, Jan. 10, 15, 19, 26. Feb. 12, 15 ('in flocks') 18, 27 and March 3; 1804, Feb. 19; 1807, Jan. 4; 1818, Dec. 23; 1821, May 12.

Cathartes aura septentrionalis. TURKEY VULTURE.

Only once mentioned. They occur in this region now only as straggling individuals and a flock is very rare so that conditions appear to be about the same.

1804. June 1. Flock of *Vultur aura*.

Pandion haliaëtus carolinensis. OSPREY.

Arrival recorded for seven years, usually under the name 'Fishing Hawk,' but once as 'Fishing Eagle' and once as '*Falco piscatorius*'.

1802. April 12. 1807. April 16.

1803. April 29. 1818. April 2.

1805. April 7. 1819. April 17.

1806. April 15.

Haliaëtus leucocephalus leucocephalus. BALD EAGLE.

1803. January 10. Grey Eagle.

Falco sparverius sparverius. SPARROW HAWK.

Evidently a common resident then as now:

Mentioned in winter lists on January 7, 1802 and January 6, 1804.

Falcones spp. HAWKS.

The river meadows below the Gardens have always been a great rendezvous for hawks.

'Hawks of various species' mentioned as present on January 6, 1802, January 9, 1803, and February 2, 1805 also:

1804. December 3. Many Owls & Hawks seen flying, sign of cold stormy weather coming.

1818. November 1. Hawks (*Falco*) arived from north.

Cryptoglaux acadica acadica. ACADIAN OWL.

1802. December 24. A very small Owl was caught, having no horns (*capitae laevi*) not much exceeding the size of a sparrow.

Megascops asio asio. SCREECH OWL.

1802. January 25. The Owl screamed last night.
 1803. January 3. Little Horned Owl appeared near the House
 hunting mice.
 February 20. Little Owl (*Strix asio*) whistles this morning
 about Daybreak.

Also recorded on February 21, 1807, January 12, 1814, July 14, 1818 and
 January 16, 1820.

Coccyzus americanus americanus. YELLOW-BILLED CUCKOO.

Date of arrival of the 'Cuccow' recorded six times, and once as '*Cuculus
 carolinensis*.' Bartram evidently did not distinguish the two species.

- | | |
|-----------------|--------------|
| 1803. May 7. | 1818. May 8. |
| 1804. May 6. | 1820. May 4. |
| 1805. April 30. | 1822. May 2. |
| 1807. May 12. | |

Ceryle alcyon alcyon. BELTED KINGFISHER.

Dates of arrival are given for six years. Usually the bird is called simply
 'Kingfisher' but sometimes '*Ispida alcyon*.' Apparently Bartram never
 found it in winter.

- | | |
|-----------------|-----------------|
| 1802. March 23. | 1818. March 16. |
| 1804. April 8. | 1821. April 11. |
| 1805. April 7. | 1822. April 13. |

In autumn he has the following. Evidently the bird did not summer
 about the garden, nor does it today.

1818. August 27. Kingfisher arived from north with their young.
 October 9. Kingfisher arived from the north on their passage
 to the south.
 1820. October 17. Kingfisher.

Dryobates pubescens pubescens. DOWNY WOODPECKER.

1818. January 17. *Picus punctatus* (least speckled woodpecker).

Sphyrapicus varius varius. YELLOW-BELLIED SAPSUCKER.

1804. October 19. *Picus varius* arived from N.
 1818. January 17. *P. varius* (Pine Woodpecker).
 November 10. Pine Woodpecker arived from the north.

Ceophlœus pileatus abieticola. PILEATED WOODPECKER.

Listed but once; without comment. Now long extinct in the vicinity of
 Philadelphia

1818. January 17. *Picus pileatus*.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.

Six dates of arrival are given by Bartram for the 'Red-head Woodpecker,' 'Red-head' or '*Picus eriocephalus*.'

1802. May 3.	1819. May 5.
1803. May 4.	1820. May 1.
1818. May 10.	1822. May 8.

In the autumn there is one record

1818. October 8. Red-head Woodpecker yet with us.

There are also two records of a Woodpecker which I take to be this bird in the juvenal plumage, which is worn well into the first winter.

1818. January 17. *Picus cinereus*.

October 8. Grey Woodpecker yet with us.

Colaptes auratus luteus. FLICKER.

Bartram refers to this bird as '*Picus auratus*,' 'Golden wing Woodpecker' and 'Flicca,' but mentions it only in the winter months when its occurrence, apparently, as at present, was regarded as worthy of note. He mentions it as present, December 13 and 18, 1802; January 11, 26, February 5 and December 10, 1803; January 6, 1804; January 1, and 5, 1819 and December 10, 1820. Usually he simply uses his quaint phrase 'yet with us' but on February 5, 1803, he tells us that they are 'feeding on *Celtis*, Red Cedar &c'.

Chaetura pelagica. CHIMNEY SWIFT.

The swift is termed 'Chimney Swallow,' '*Hirundo pelagica*' or 'Chimney-bird' by Bartram and its arrival is recorded as follows:

1802. May 3.	1806. April 26.
1803. May 2.	1818. May 11.
1804. April 29.	1819. June 5.

Bartram particularly mentions after the last 'first appearance this year.' It seems inconceivable however that it had not arrived in the vicinity long before. In fact all his dates for this species are late compared with recent observations.

For the Autumn he gives three records

1803. September 29. Chimney-bird left us.

1806. September 9. Chimney-bird yet with us.

1821. August 19. Chimney Swallow yet with us.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.

Almost always referred to as the 'Huming Bird' to which is added in one instance *Trochilus colubris*. Dates of arrival as follows:

1802. April 28.	1819. May 4.
1803. April 21.	1820. April 26.
1818. May 10.	1822. May 1.

On the second date of the list he adds that 'Apple and Judas Trees bloom and Glow-worms sparkle'. In the autumn the 'Huming Bird' was 'yet with us' on September 19, 1804, October 14, 1805, October 16, 1806, on which day there was white frost; September 3, 1818, and September 15, 1819.

Tyrannus tyrannus. KINGBIRD.

The 'Kingbird's' arrival is recorded for nine seasons.

1803. May 4.	1819. May 7.
1804. May 4.	1820. May 14.
1806. April 28.	1821. April 25.
1807. April 20.	1822. May 1.
1818. May 9.	

In autumn it was 'yet with us' on September 3, 1818.

Myiarchus crinitus. CRESTED FLYCATCHER.

Recorded regularly as '*Muscicapa crinita*,' the vernacular name being used but once.

1802. May 9.	1821. May 10.
1818. May 8.	1822. May 9.
1819. May 22.	

Myiochanes virens. WOOD PEWEE.

Only the following, although the bird according to Wilson was a regular breeder in the garden.

1802. May 22.	<i>Muscicapa rapax</i> , Wood Pewit, arrived.
1822. May 3.	Wood Pewit.

Sayornis phœbe. PHŒBE.

One of the few species whose arrival is reported every year, always under the familiar name of 'Pewit.' The dates are as follows:

1802. March 18.	1818. March 13.
1803. March 15.	1819. March 24.
1804. March 22.	1820. March 17.
1805. March 7.	1821. March 10.
1806. March 9.	1822. March 8.
1807. March 16.	

The nest building of 'Pewit' is chronicled in

1802. March 22.	1805. March 18.
1803. March 21.	1818. April 3.
1804. April 27.	

In the autumn 'Pewit yet with us' is recorded on

1803. October 8.	1818. September 3.
1804. October 14.	1819. September 18.
1805. Sept. 30, Oct. 9, 12, 14	1820. October 12.
and finally Nov. 1.	

1806. December 1.

Among the few records for 1814 when the diary lasted but a month and a half we find this interesting note:

1814. January 13. Moderate winter weather. Ice in the River but driving with the Tides. Pewit was seen.

Otocoris alpestris alpestris. HORNED LARK.

1803. January 9. *Alauda alpestris*. Morning clear & cold River frozen over near half inch thick of Ice.

1804. February 19. *Alauda alpestris*. Warm pleasant spring weather.

1818. January 17. *Alauda alpestris*.

Cyanocitta cristata cristata. BLUE JAY.

'Jays' are recorded on January 5 and 9, 1803; January 24, 1804; February 2, 1805; March 13, 1818; January 26 and December 30, 1822. The winter is the only time when any attempt is made to give complete lists of birds seen, which accounts for the mention of many resident species at this season only.

Corvus brachyrhynchos brachyrhynchos. CROW.

Crows are reported in January of nearly every year.

1802. January 27. Large flights of Crows to the southward (*Corvus frugivorus*).

1805. February 2. Large flights of Crows pass morning & evening to & from their roosts.

1822. February 22. Flights of Crows passing to N. E.

These records apparently refer to the roost at Merchantville, N. J.

May 18, 1818. 'Young Crows' are recorded.

Corvus corax principalis. RAVEN.

1807. April 15. A pair of Ravens passt westward.

Dolichonyx oryzivorus. BOBOLINK.

1802. May 6. Male rice bird (*Emberiza oryzivora*) arived.

1803. May 13. Rice Bird arived.

June 2. Female Rice Bird passing to the north after the males to breed.

1818. May 10. Rice bird (Bob-lincolin).

1819. May 17. Rice birds on their passage northerly.

1822. May 3. Rice bird passing northerly.

The only autumn record is:

1818. August 24. Rice birds arrive from the north to feed on grain of *Zizania*, *Persicaria* & grass.

Molothrus ater ater. COWBIRD.

The arrivals of the 'Cowpen Bird' are as follows:

1802. March 18.	1808. March 22.
1803. March 12.	1819. April 6.
1805. February 23.	1822. April 19.
1807. March 17.	

Agelaius phœniceus phœniceus. RED-WINGED BLACKBIRD.

Usually Bartram speaks of the 'Red-wing Blackbird' sometimes abbreviating it to 'Redwing' and occasionally using 'Red-wing Sterling,' or 'Blackbird, *Oriolus phœnicia*'.

1802. February 14.	1808. March 3.
1803. February 8.	1818. February 28.
1804. February 16.	1819. February 10.
1805. February 11.	1820. February 15.
1806. February 20.	1821. February 19.
1807. February 22.	1822. February 22.

Additional records are of 'flights passing northerly all day'—March 11, 1803, etc. While on December 10, 1803 and December 29, 1819 he writes 'Red-wings yet with us'.

Icterus spurius. ORCHARD ORIOLE.

Recorded as '*Oriolus spurius*' except once when '*O. bicolor*' is used presumably referring to this species.

1802. April 28.	1820. April 23.
1808. April 25.	1822. April 30.
1819. April 28 (<i>O. bicolor</i>).	

On July 24, 1804 is the record '*Oriolus spurius* yet given us short songs.

Icterus galbula. BALTIMORE ORIOLE.

The records are as follows:

1802. April 28.	Hanging bird (<i>Oryolus Baltimora</i>).
1803. May 3.	Baltimore.
1806. April 28.	Oriolus [possibly the other species].
1818. May 2.	Baltimore arrived.
1820. April 26.	<i>Oriolus baltimore</i> .
1822. May 1.	<i>Oriolus baltimore</i> , Hangnest or Baltimore Fire bird.
Also one autumn record.	
1804. August 19.	Baltimore Bird yet with us.

Sturnella magna magna. MEADOWLARK.

Recorded either as '*Alauda magna*' or 'Meadow Lark.' It is mentioned in winter lists on Jan. 9, Feb. 21, Dec. 11 and 26, 1803; Jan. 6, 1804; Feb. 3, 1808; Jan. 17, 1818; Dec. 10, 1820; Jan. 3, 1821; Dec. 8 and 30, 1822. On April 2, 1819; and March 5, 1820, the first spring singing is recorded.

Quiscalus quiscula quiscula. PURPLE GRACKLE.

Usually referred to as 'Crow Blackbird,' '*Gracula Barita*' or '*Gracula purpurea*' and once as '*Grackle*.' Arrivals:

1802. February 17.	1818. March 1.
1803. February 23.	1819. March 6.
1804. March 11.	1820. February 17.
1805. February 22.	1821. February 26.
1807. March 12.	1822. February 22.

There are two autumn records, October 9, 1820 and November 30, 1822 when Bartram writes 'Crow blackbirds yet.' while, on September 11, 1820 he records 'Evening flight of blackbirds passing to their roost in Jersey' This may of course refer in part at least to the Red-wing.

Loxia curvirostra minor. RED CROSSBILL.

1802. March 12.	Crossbill passing Northerly. Drizzling warm day.
1803. October 9.	<i>Loxia curvirostra</i> arived from N. Asters, Golden rods, Helianthus, Rudbeckia and Coreopsis in flower.
December 24.	Crossbill in Flocks feeding on Pine seeds & Seeds of the Ash. Christmas Eve.
" 26.	Crossbill.
1805. February 26.	Crossbill arived from south on their way northward.
1819. January 5 and 6.	Crossbill.

Carpodacus purpureus purpureus. PURPLE FINCH.

Referred to as 'Purple Finch' and '*Fringilla purpurea*,' usually mentioned only in midwinter, when more complete lists were recorded.

It is mentioned as present on Jan. 23, 1802; Jan. 15, 1803; Jan. 26, 1804; Feb. 28, 1818; January 2 and 6, 1819; and December 30, 1822.

On January 27, 1804 is the record 'Purple Finch feeding on seeds of the Ash' and on October 12 of the same year 'Purple Finch' & Hemp bird arrived from the north.' What the 'Hemp bird' might be I have been unable to ascertain but it is possible that the females and immature males of the Purple Finch may have been so designated. The 'Hempbird' was also present on Jan. 12, 1821.

Acanthis linaria linaria. RED-POLL.

There are the following records. That of April 30 is unusual but it seems certainly to refer to this species.

1818. January 18.	Snow, Last night freezing. <i>F. rubricapilla</i> (Red-cap Finch).
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- April 30. Little red-cap Finch busy picking Affides off the
Apple buds. Frost this morning, cold, blusterous.
1822. January 19. Red-crowned Linnet.
January 25, and 29. *Fringilla flammea*.

Astragalinus tristis tristis. GOLDFINCH.

Entered as '*Fringilla tristis*,' once with 'Yellow Bird' added. Jan. 23
and Dec. 31, 1802; Jan. 18, and Mar. 13, 1818 and Jan. 1 and 6, 1819.

Plectrophenax nivalis nivalis. SNOW BUNTING.

Only mentioned once, apparently as rare as it is today.
1803. January 9. *Emberiza nivalis*.

Melospiza melodia melodia. SONG SPARROW.

The following appear to refer to this species:

1803. February 12. Sparrows sing (*Fringilla rufa*).
March 3. Sparrows sing.
1804. Red Sparrow arrived [possibly = Fox Sparrows].
1818. January 17. *F. melodus*.
February 5. Song Sparrow sings.
May 18. Young Song Sparrows.

Melospiza georgiana. SWAMP SPARROW.

1802. May 3. Marsh Sparrow (*Fringilla palustris*) arrived.

I am not at all sure that this refers to our Swamp Sparrow. Bartram's
knowledge of the species of Sparrows was evidently limited, until after
the appearance of Wilson's 'Ornithology.'

Spizella passerina passerina. CHIPPING SPARROW.

Curiously enough there are very few records of this common species.
They are as follows:

1818. April 22. Domestic Sparrow lays eggs.
1820. March 16. Chipping Sparrow arrived a week past.
April 11. House Sparrow building its nest.

Zonotrichia albicollis albicollis. WHITE-THROATED SPARROW.

Recorded as '*Fringilla albicollis*' on Jan. 9, 1803, Jan. 2 and 17, 1818.

On May 1, 1819 is the entry 'White-throat Sparrow disappeared, gone
on to the north to breed' and on April 13, 1822 'White-throat Sparrow is
bound northerly'.

Junco hyemalis hyemalis. JUNCO.

Referred to as 'Snow bird' or '*Fringilla hyemalis*' and mentioned in
winter lists on Jan. 6, 1802; Jan. 9, 1803; Jan. 24, 1814; and Jan. 17,
1818.

On February 8, 1803 we find 'Snowbirds begin to associate, meditating their departure for the north,' and again on March 11, 1803, 'Snowbirds and other sparrows assemble meditating their journey to the north.'

Dates of arrival in autumn are as follows, all quite late as compared with our recent records:

1803. October 22.	1819. October 20.
1805. October 28.	1820. October 25.
1806. October 29.	1821. October 30.

Pipilo erythrophthalmus erythrophthalmus. TOWHEE.

No bird mentioned in the Journal is referred to by as many names as is the Towhee. Two or three times the technical name is attempted with such results as '*Fringilla erythopalma*' or '*F. eriophalma*,' while the vernacular names are variously spelled, 'Towhee' 'Towe Bird,' 'Towhee bunting,' 'Chewink,' 'Tewink,' 'Tiewink,' and 'Ground Robin.'

Dates of arrival are:

1802. April 19.	1818. May 2.
1803. April 15.	1819. April 18.
1804. April 14.	1821. April 24.
In autumn the 'Tewink' is recorded as 'yet with us':	
1803. October 22.	1818. November 20.
1804. October 3.	1819. October 8.
1805. October 25.	1820. October 17.

There were several years when individual birds wintered in the garden as we find the following:

1806. January 18. Saw a Tewink in a sheltered situation Very cold, 10° above zero.

The next winter a bird is reported on Dec. 24, 1806, Jan. 16, 20, 22 and 27, 1807.

In 1820 we find: 'December 28. Towhee bird (*Fringilla eriophalma*). Began to snow, now five inches on the earth,' but on January 2, in spite of the snow he was 'yet with us' and on May 13 following we read 'Towhe hunting building its nest in the garden.'

Passerina cyanea. INDIGO BIRD.

Always referred to as the 'Blue Linnet' with '*Emberiza Cyanea*' added one one occasion.

Arrival dates are as follows:

1802. May 7.	1819. May 8.
1804. May 8.	1820. May 9.
1807. May 6.	1821. May 12.
1818. May 8.	1822. May 3.
Autumn dates when the species was still present are:	
1803. October 2.	1818. September 3.
1804. October 3.	1819. September 18.

The late singing of the Indigobird is noted on August 3, 1803 when we find the note 'Birds cease singing, except Blue Linnet & some other species of *Fringilla*'; and on July 24, 1804 and August 7, 1818 when 'Blue Linnet yet gives us short songs.'

Cardinalis cardinalis cardinalis. CARDINAL.

The Cardinal is frequently mentioned in winter lists and its whistling is noted.

1803. January 3, 9, 22 and 28. Redbird.
 January 19. *Loxia cardinalis*. March 12. Redbird.
 1805. February 2. Redbird whistles.
 1806. April 5. Redbird sings.
 1807. April 11. Redbird.
 1818. January 17. *Loxia cardinalis*.
 April 12. Redbird whistles.
 1820. March 17. *Loxia cardinalis* sings.
 1822. May 8. Cardinal redbird.

Spiza americana. DICKCISSEL.

This bird now long absent from the Delaware valley appears to have been of regular occurrence in Bartram's time. We find the following records:

1802. May 3. May Bird (*Alauda calandra*) arrived.
 1818. May 13. May Bird (*Calandra*).
 1819. May 5. Maybird.
 1820. May 7. Maybird (*Calandra*).

Piranga erythromelas. SCARLET TANAGER.

Bartram always refers to this species as the 'Summer Redbird.' Its arrival is recorded five times:

1803. May 7. 1819. May 6.
 1804. May 7. 1822. April 23.
 1808. April 25.

Piranga rubra rubra. SUMMER TANAGER.

The 'Sandhill Redbird' which was of frequent occurrence in New Jersey in Bartram's time, was apparently always rare on the western side of the river. It is recorded but once in the diary, on May 10, 1818.

Ampelis cedrorum. CEDAR WAXWING.

Mentioned mainly in winter, probably because its occurrence at this time was considered more noteworthy than in summer.

1802. March 2. Flocks of Cedarbirds.
 December 22. Ampelis feeding on fruit of *Celtis*, *Juniperus*
 and *Diospyros*.

1803. January 9. Ampelis. March 11 Cedar Bird appears.
 1807. January 19. and 1818 January 29, Cedarbirds.
 1820. May 16. Ampelis feeding on blossoms of double flowering
 Cherry.
 1821. January 2. Ampelis feeding on berries of *Euonymus atropur-*
pureus.
 1821. January. 12 and 1822. January 23, 26, 29 Cedarbirds.

Progne subis subis. PURPLE MARTIN.

1804. August 19. Purple Martin yet with us.
 1805. April 4. *Hirundo purpurea* arrived.
 1807. April 11. Martin arrived.
 1821. April 25. Purple Martin.

Riparia riparia. BANK SWALLOW.

Usually recorded as 'Bank Martin' but a few records of 'Martin' seem to refer to this species rather than to the preceding, of this however I am not positive.

1802. March 24. Flights of Bank Martin passing northerly (*Hirundo trogloditus*).
 1803. March 30, 31, and April 3. Bank Martin passing northerly all day.
 September 29. Bank Martin passing daily in large flights southerly.
 1804. April 8. Flights of Martin.
 October 5 and 9. Flights of Bank Martin passing southerly.

Later dates of arrival are:

- | | |
|-----------------|-----------------|
| 1805. March 26. | 1818. April 8. |
| 1806. March 31. | 1819. April 12. |
| 1807. March 24. | 1820. April 13. |
| 1808. March 31. | 1821. April 25. |

Hirundo erythrogastra. BARN SWALLOW.

Referred to as 'Barn Swallow' or 'House Swallow' and once as *Hirundo domestica*. Dates of arrival are:

- | | |
|-----------------|-----------------|
| 1802. April 7. | 1807. April 11. |
| 1803. April 1. | 1818. April 15. |
| 1804. April 8. | 1819. April 17. |
| 1805. April 4. | 1820. April 13. |
| 1806. April 10. | 1822. April 11. |

Autumn records of 'yet with us':

- | | |
|---------------------|---------------------|
| 1803. September 29. | 1818. September 12. |
| 1804. August 19. | 1819. September 12. |
| 1806. August 18. | 1821. August 24. |

Icteria virens virens. YELLOW-BREASTED CHAT.

Arrived:

1802. May 4.	1820. May 8.
1803. May 3.	1821. May 10.
1807. May 6.	1822. May 9.
1819. May 14.	

Seiurus aurocapillus. OVEN-BIRD.

This bird is referred to by a variety of names as seen in the records of arrival; viz:

1802. April 19.	Least Wood Thrush (<i>Turdus trogloditus</i>).
1805. April 22.	<i>Turdus trogloditus</i> .
1808. April 25.	<i>Turdus trogloditus</i> .
1818. May 10.	Little Yellow-crested or Ground Thrush.
1819. April 25.	<i>Turdus cristatus</i> , Least golden-crowned Thrush.

Setophaga ruticilla. REDSTART.

Arrived:

1802. May 2.	1819. May 4.
1805. April 18.	1820. April 24.

Anthus rubescens. PIPIT.

1803. March 7.	<i>Alauda migratoria</i> .
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Toxostoma rufum. BROWN THRASHER.

The Thrasher is referred to as 'Fox-coloured Thrush', 'Red Thrush', 'Red-brown Thrush', 'Brown Thrush', 'Great Brown Thrush' or simply 'Thrush'; the second and last being used most frequently. The technical name '*Turdus rufus*' is often added.

The dates of arrival are:

1802. April 11.	1818. April 17.
1803. April 11.	1819. April 7.
1804. April 17.	1820. April 15.
1805. April 9.	1821. April 24.
1807. April 21.	1822. April 19.

It is recorded as 'yet with us':

1803. October 8.	1806. October 29.
1804. October 3.	1818. November 20.
1805. October 9.	1819. October 8.

Dumetella carolinensis. CATBIRD.

Once the generic term '*Lucar*' is added to the vernacular name.

Dates of arrival are:

- | | |
|-----------------|-----------------|
| 1802. April 22. | 1818. May 2. |
| 1803. April 24. | 1819. April 30. |
| 1805. April 22. | 1820. April 27. |
| 1808. April 24. | 1822. April 24. |
- Latest autumn records are:
- | | |
|-------------------|-------------------|
| 1803. October 8. | 1818. October 8. |
| 1804. October 14. | 1819. October 8. |
| 1805. November 6. | 1820. October 12. |
| 1806. October 7. | |
- Other entries are:
- | | |
|------------------|---|
| 1804. July 24. | Catbird yet gives us short songs. |
| 1807. July 16. | Catbird ceases singing. |
| 1818. August 4. | Catbird done moulting. |
| 1820. January 8. | Was surprised at hearing the voice of the Catbird in the garden. |
| January 9. | The Catbird feeding on the berries of <i>Sideroxylon</i> . |
| January 10. | Tempestuous, toward evening began to snow which soon covered the ground. Catbird yet in the garden. |

Mimus polyglottos polyglottos. MOCKINGBIRD.

This bird now only an accidental straggler in eastern Pennsylvania was apparently of regular occurrence at the time the journal was written.

The references to it are given in full.

- | | |
|-----------------------------------|---|
| 1802. January 5. | Mocking Bird (<i>Turdus polyglottos</i>) not yet left us on his passage to the south. |
| December 2. | Mocking Bird yet with us. |
| December 4, 13, 15, 20. | Mock Bird. |
| 1803. January 19, 22. | Mock Bird. |
| October 29. | Mockbird on his passage southerly. |
| November 8. | Mockbird yet with us, being northern passengers on their journey southward, feeding on Smilax &c. |
| November 18, December 10, 26, 31. | Mockbird yet. |
| 1804. January 1, 3, 6. | Mockbird. [very cold weather then ensued]. |
| November 2. | Mockingbird with us on his passage southerly. |
| 1820. April 18. | Mockingbird arrives from the south, caught a male one in a trap-cage bated with a female one. |
| April 20. | Caught another Mockingbird in trap-cage. |

Thryothorus ludovicianus ludovicianus. CAROLINA WREN.

In the earlier records this bird is called the 'Great Yellow-throated' or 'Great Yellow-breasted Wren' but in 1820 it is the 'Great Carolina Wren'.

1804. September 11. Many kinds of small birds on their passage southward particularly the Great Yellow-throated Wren and species of *Motacilla*.

It is then recorded on a number of days through November and December until January 31, 1805. There is no other record until March 27, 1820.

Traglodytes aëdon aëdon. HOUSE WREN.

Once called, 'Garden Ren' (*Motacilla familiaris*) otherwise 'House Wren' or 'Ren'.

Arrived:

1802. April 21. 1819. April 18.

1805. April 20. 1820. April 15.

1806. April 20. 1821. April 24.

1807. April 21. 1822. April 18.

1818. April 22.

Two autumn dates are given when the species was 'yet with us':

1804. September 26. 1819. September 19.

Nannus hiemalis hiemalis. WINTER WREN.

1814. February 7. Little Winter Wren.

1818. January 17. *C[erthia] migratoria*. Little Winter Wren.

November 10. Winter Wren arrived from the north.

1819. January 1. Winter Wren.

Certhia familiaris americana. BROWN CREEPER.

This bird is referred to by the name 'Pine Creeper,' once with the name, 'Parus pinus' added and once 'Certhia caudacuta'.

1802. April 19, arrived. 1818. October 8 arrived.

1818. February 28. 1819. October 9 "

1819. April 18 arrived.

Bæolophus bicolor. TUFTED TITMOUSE.

1802. January 6. *Parus cristatus*.

1804. February 12. Titmouse sings.

1818. January 17. *Parus bicolor*.

Penthestes atricapillus atricapillus. BLACK-CAPPED CHICKADEE.

1802. January 6. *Parus atricapillus*.

1818. January 17. *P. atricapillus*.

1821. September 11. Black-cap approaches our dwelling with his lively, cheerful, notes; reminds us of winter coming.

Sitta canadensis. RED-BREASTED NUTHATCH.

Recorded as *Sitta canadensis* on January 6, 1802 and January 17, 1818.

Sitta carolinensis carolinensis. WHITE-BREASTED NUTHATCH.

Sitta atricapilla is recorded January 17, 1818.

Poliophtila cærulea cærulea. BLUE-GRAY GNATCATCHER.

Referred to as 'Little Grey Flycatcher', 'Blue-grey Flycatcher', 'Little Gray Squeeling Flycatcher' and '*Molacilla grisea*'.

Although excessively rare today about Philadelphia it seems to have been of regular occurrence a century ago.

Arrived:

1802. April 2.	1819. April 18.
1804. April 13.	1820. April 15.
1805. April 4.	1821. April 24.
1806. April 1.	1822. April 19.
1807. April 20.	

Regulus satrapa satrapa. GOLDEN-CROWNED KINGLET.

In almost every instance Bartram records both the "Golden and Ruby-crown Wren" together. The winter records certainly do not apply to the latter and whether the dates of arrival apply to one or both it is impossible to say.

Arrivals:

1804. September 30.	1820. October 18.
1818. November 10.	1821. October 4.
1819. October 7.	

Winter records are January 6 and December 31, 1802; January 11, 1803; January 2, 1818; January 5, 6 and February 1, 1819.

Hylocichla mustelina. WOOD THRUSH.

Called 'Wood Thrush,' 'Wood Robbin,' 'Song Thrush,' and '*Turdus minor*.'

Arrived:

1803. May 2.	
1807. April 26.	1820. May 8.
1808. April 27.	1821. May 5.
1818. May 9.	1822. April 26.
1819. April 18.	

An arrival date, April 12, 1802, must refer to the Hermit Thrush while autumn dates September 29, 1803, November 20, 1818 and October 3, 1819 are of doubtful application.

Planesticus migratorius migratorius. ROBBIN.

No species is more frequently recorded: always as 'Robbin' occasionally with the addition of '*Turdus migratorius*.'

Every winter they occurred in flocks feeding on fruits of *Celtis*, Red Cedar. 'Pasimmons' and once on frozen apples thawed on the trees.'

1802. January 6 and December 15.
 1803. January 9, 11, 15, 19, 26. February 5, 7.
 February 8. Sings.
 February 20. Seeks his mate.
 April 5, build their nest.
 December 10. yet with us.
 1804. January 6, 12, 16 (large flights seem to be on their passage south),
 27, February 8, March 1.
 October 3 flights from the north.
 1805. January 13, 18, February 2 large flights.
 March 18 pair and begin building their nest.
 1806. December 16, 19 large flights.
 1807. January 4, 10, 17, 19.
 1808. March 9 Robbin sings.
 1818. January 17, 19.
 February 28 Robbin sings.
 April 3 builds nest.
 September 7 flights from the north.
 1819. March 5. Robbins arrive.
 1820. December 10, 15, 19, 26 large flights.
 1821. January 3, 12, 14, 15, 16, 17, 18.
 January 19, 20 but few seen.
 January 21. Robbins yet in plenty. Three inches of snow.
 January 30. Robbins. [On the 25th the temperature was 8° below zero and on the 29th "the ice on the Schuylkill is 12-14 inches in thickness and the Delaware so strong opposite the city affording a constant and safe intercourse with New Jersey on the ice. Carts and Sleds constantly passing loaded with wood, hay &c. Many teams drawn by six horses]
 1822. January 4, 16, 23, 25, 26, 29. February 3, 7, 10, 13, 22.

Sialia sialis sialis. BLUEBIRD.

Present throughout the winter months, and often recorded singing in January, and feeding on berries of *Prinos verticillatus*, *Celtis*, *Euonymus* and Red Cedar.

Nesting dates etc.

1802. March 15. Build their nests.
 1803. February 20. Bluebird seeks his mate.
 March 6. Bluebirds pair.

- April 5. Building their nest.
 May 12. Brought out their young.
 1804. May 18. Bro't out their brood.
 1805. March 18. Pair and begin building their nest.
 May 18. Bro't out their young brood.
 1808. March 9. Bluebirds pair.
 1818. April 3. Building their nest.
 April 22. Bluebird lays eggs.
 May 18. Young Bluebirds.
 1819. May 7. Bluebird brought out their first brood which are under protection of the father whilst the hen is laying for the next family.
 1820. March 16. Building nest.

COMPARISON OF MIGRATION DATA WITH RECENT RECORDS.

The thought that will naturally occur to anyone who has read the foregoing record is: How do Bartram's dates of arrival compare with those of a century later?

I have called attention elsewhere to the difficulty of securing results of value by comparing individual migration records.¹ By comparing dates of first arrival we may have in one instance a very early straggler and in another the beginning of the main flight, records which are really not comparable at all. Furthermore I have shown that the average dates of arrival for a number of years will differ materially in the records of equally good observers situated only a few miles apart, owing to the fact that the first migrants of a given species may be present for some days in one neighborhood before any are seen in a nearby locality.

For this reason it seems to me that reliable results can only be obtained by combining the records of a number of observers clustered around a given center and selecting as a date for comparison the day upon which the species has reached a majority of the stations, dropping off a definite proportion of obviously late records under each species.

The Delaware Valley Ornithological Club has had for twelve years a corps of from 20 to 35 observers recording migration immediately about Philadelphia and the results of their work is published annually in 'Cassinia.'

¹ Proc. Acad. Nat. Sci. Phila. 1908, p. 134.

I have computed the average of the earliest arrival date furnished by any of these observers for each year, and also a 'bulk arrival' date as explained above, for comparison with Bartram's average date of arrival for 1802-1822, and the three sets of dates are given in the accompanying table.

We should expect most of the dates of any single observer of our corps to fall between the two dates given and in sixteen cases Bartram's dates do so, indicating that there has been no change in the time of arrival during a century. In four cases they are later than the date of 'bulk' arrival—Kingfisher 5 days, Chimney Swift 9 days, Bobolink 1 day, Towhee 1 day.—The Kingfisher is an irregular species often wintering here while Bartram's dates for the Chimney Swift are in all probability inaccurate since Barton (see below) gives April 23 which agrees well with our recent records.

Five species on Bartram's list are earlier than our average first arrival—Hummingbird 3 days, Orchard Oriole 4 days, Baltimore Oriole 1 day, Red-eyed Vireo 3 days, Yellow Warbler 2 days.—Of these the Vireo is probably too early as Bartram did not know either the Solitary or Yellow-throated Vireos and may have confused them with it. For the Yellow Warbler his location was peculiarly favorable while for the Hummingbird and Orchard Oriole the recent records are not so full as might be and the dates computed are probably late.

Prof. W. W. Cooke¹ has recently made a comparison of the dates of arrival given by Dr. Benjamin Smith Barton in his 'Fragments of Natural History' for 1799, with his own computations from the recent records of the U. S. Department of Agriculture for the vicinity of Philadelphia. It is interesting to compare these dates with those just given as Barton's observations and Bartram's were undoubtedly made in almost the same spot. We find that in fifteen species which occur in both lists, the date of arrival is the same in only one. In seven cases Bartram's dates are later than Barton's by from one to nine days (average five days); while in seven cases they are earlier by from two to seven days (average four days).

Prof. Cooke's computed dates for arrival at Philadelphia for

¹ 'Cassinia', 1912, p. 7.

these fifteen species agree with the average date of first arrival that I have computed from the Delaware Valley Club's records in but one instance. In eight cases they are earlier than mine by from one to four days (average two days), while in six cases they are later by from one to three days (average two days). These facts seem to demonstrate pretty conclusively the futility of figuring closely on comparisons of observations of single individuals or upon 'first arrival' records of any sort. At the same time I think that from a study of the accompanying table we are justified in saying that no appreciable change in the time of arrival of these birds has taken place in the past century.

	Bartram	D. V. O. C.	
	1802-1821	1901-1912	
	Average Date of First Arrival	Average Date of First Arrival	Average Date of 'Bulk Arrival'
Spotted Sandpiper	April 18	April 16	April 27
Killdeer Plover	Feb. 28	February 27	March 11
Kingfisher	April 3	March 13	March 29
Chimney Swift	May 2	April 18	April 23
Hummingbird	April 30	May 3	May 10
Kingbird	May 1	April 29	May 5
Phœbe	March 14	March 11	March 21
Bobolink	May 10	May 4	May 9
Red-winged Blackbird	Feb. 18	Feb. 28	March 9
Orchard Oriole	April 27	May 1	May 6
Baltimore Oriole	April 30	May 1	May 5
Purple Grackle	Feb. 28	Feb. 22	Feb. 28
Towhee	April 20	April 5	April 19
Indigo bird	May 8	May 3	May 8
Scarlet Tanager	May 1	May 1	May 6
Barn Swallow	April 10	April 10	April 23
Red-eyed Vireo	April 28	May 1	May 7
Yellow Warbler	April 23	April 25	April 30
Maryland Yellow-throat	April 27	April 23	April 28
Yellow-breasted Chat	May 8	May 2	May 8
Ovenbird	April 23	April 25	April 30
Redstart	April 27	April 27	May 4
Brown Thrasher	April 15	April 14	April 23
Catbird	April 26	April 24	April 30
House Wren	April 20	April 20	April 26
Wood Thrush	April 29	April 24	April 30

CONCERNING THE FLIGHT OF GULLS.

BY ALEXANDER FORBES.

MR. WILLIAM BREWSTER has recently published in this journal¹ a most interesting and important account of the soaring of gulls to windward. His account is especially valuable since his observations were made with such care and accuracy that no room is left for doubt that the birds soared for long distances horizontally against a strong wind in the neighborhood of a steamer, without the aid of wing beats. The phenomenon is of such interest from the standpoint of physics that it seems to me to warrant further discussion.

The essential features of his observations are briefly as follows:—The steamship on which Mr. Brewster travelled was steaming at a rate of about fifteen knots an hour, with a wind at first blowing at a rate of about twenty miles an hour from about two points off the port bow, and later freshening to a gale of about thirty-five miles an hour and shifting somewhat more nearly dead ahead. Under these conditions a large number of gulls accompanying the ship glided the greater part of the time on set wings; at first flapping their wings at fairly frequent intervals, but, as the wind freshened, less and less frequently until at the height of the gale most of the birds could be seen to glide “over distances certainly exceeding a mile, without a single wing beat.” He says of them when gliding: “their respective positions in relation to each other and to the ship were so accurately and systematically maintained that whenever I got one of them in line with any fixed object on the deck I could often hold it there, without myself moving again, for several successive minutes.” Thus it is clear that their motion was horizontal not downward, and that its continuance with unabated speed eliminates the possibility of explaining it as the result of momentum acquired in a previous downward swoop, or from previous wing beats.

The distribution of birds in relation to the ship was as follows:—“A few followed the creamy wake of the ship or poised directly over her just to the rear of her smoke-stack but the majority kept

¹ 'The Auk,' Jan., 1912, p. 85.

abreast of her to the windward side, the somewhat sheltered lee side being persistently avoided. On a level with her upper deck or a little above it, they were generally and rather evenly distributed — although more thickly in places than in others — all the way from her stern to amidships, some keeping within a yard or two of the rail, others thrice that distance off, still others fifty or more yards out over the water." He also occasionally saw "one of them leave the rest, and, going two feet to their one, forge ahead of them all perhaps to the bows of the steamer and beyond, yet without once beating its wings."

Mr. Brewster notes that when the birds soared during the height of the gale their wings were held back and with a "downward trend of the flight quills." He suggests that "the wind constantly fills the concave wings of the gliding gulls much as it does the sails of close-hauled vessels and with similar results but with this essential difference: that whereas its force is exerted for the most part laterally on the vessels' sails and opposed by the side thrust of their keels or centreboards in the water, it must have chiefly a lifting effect on the wings of the gulls and be counteracted by the weight of their bodies bearing downward. Hence we may infer that in the case of these birds forward movement is the resultant of two component forces, that of wind and of the attraction of gravitation." He then refers to an article by G. F. Tydeman in which by "extensive use of abstruse mathematical calculations" the phenomenon is analysed. Mr. Brewster then says that he dissents from Tydeman's conclusion "that birds gliding to windward depend for means of propulsion largely if not wholly on uplift afforded by powerful ascending currents of air such as must always rise above a vessel when heavy wind is striking against and deflected from, her sides." He says that for a time he favorably considered this view, adding:—"But I dismissed it altogether from my mind after repeatedly seeing birds hundreds of yards behind the steamer, or fifty or more yards to one side (always the windward one) of her, or even well in advance of her, gliding on set wings in precisely the same manner and quite as ceaselessly as those which hung about her flanks. It seems inconceivable that her presence or movement could have caused vertically rising currents of air to be regularly maintained at such distances from her as those just mentioned, or that they

could have been thus constantly and generally maintained by other influences when the ocean all about her was swept by a wind blowing over thirty-five miles an hour. I even doubt if they extended much above her upper deck for there I was lashed incessantly in the face by what seemed to be horizontally-racing wind, while several of the gulls were often sailing fifteen or twenty feet higher still, perhaps directly over me. On the other hand it must be admitted that I have never known any of these birds to glide far to windward except when accompanying a steamship, a fact which apparently lends some support to Mr. Tydeman's contention, although not necessarily having such significance since it may reasonably be interpreted in other ways."

With the data so thoroughly determined the problem resolves itself into one of comparatively elementary physics. I have not seen Tydeman's article, but I believe that without his abstruse calculations it is possible by reasoning which is within the reach of those untrained in higher mathematics to show that the phenomenon of horizontal gliding could not be produced in the way Mr. Brewster suggests.

Let us assume for the present that the wind is blowing horizontally and uniformly, that the air is an evenly moving mass without local distortions. Then to a bird surrounded by the moving mass it is as if the air were still and the earth's surface travelling by underneath. The bird will tend to drift freely with the wind and will feel no more pressure from it than from the surrounding air in a flat calm. The case of a bird in contact with only one medium moving uniformly is wholly different from that of a boat in contact with two media, air and water. The tendency of the water to prevent free drifting with the wind is the sole cause of the wind's pressure on the boat as long as the air moves uniformly. The bird can only feel pressure from the surrounding air in case of a sudden alteration in the speed or direction of the wind, or in case of motion through the air imparted by gravity or by the bird's own efforts.

The problem of gliding can best be considered by regarding the bird as in a calm and analysing its possible motions with respect to the surrounding air regardless of the earth beneath. After this analysis we may introduce the relative motion between air and

earth. Suppose, then, a bird in still air: in what directions can he glide without wing beats? Motion in any direction will be met by friction from the air. To overcome this, energy must be expended. This may be supplied by muscular action through the bird's wing beats, or by gravity. In the present case we have eliminated wing beats as we are dealing with gliding on set wings, and the only possible source of energy which remains to drive the bird is gravity. Gravity can only work effectively by inducing motion in a direction with a downward component; in a direction which satisfies its demands, so to speak, by bringing the object downward. The direction may deviate from the horizontal by ever so slight a slope, but it must have some downward component. For a bird with nothing but the resistance of his wing expanse to keep him from falling there must be a considerable downward component, especially if the gliding is to be rapid. The only case in which the energy imparted by gravity can carry a bird in still air in a direction without a downward component is when the bird soars for a short distance horizontally or even upwards with the momentum acquired in a previous downward swoop. This case is clearly ruled out of the present problem. Now the horizontal movement of the atmosphere in a wind without ascending currents or other irregularities does not alter the case of still air except in that the bird tends to be carried horizontally with the wind, and consequently must glide more rapidly through the air if going to windward in order to make headway over the earth's surface. In order to glide faster through the air the downward component of the direction of gliding must be increased.

When analysed in this way I think it is evident that no combination of the forces of a uniform horizontal wind and gravity can drive a soaring bird horizontally to windward. The fundamental difference between the close-hauled sailboat and the soaring bird with downward sloping flight quills may be considered in the following way. If a force is to do work the mass upon which it acts must move in such a way as to yield to the force. When a boat, close-hauled, sails to windward she moves in such a way that the sail is withdrawn from the wind's pressure (Fig. 1). When the gull soars with a horizontal wind bearing against the under surface of the downward sloping wing forward motion will not make the

wing withdraw from the wind's pressure but will do the reverse. The fallacy in the wind-gravity conception lies in likening gravity to a kite string which, unlike gravity, holds the kite from drifting to leeward.

The gull, being a very perfect gliding machine, can soar at a

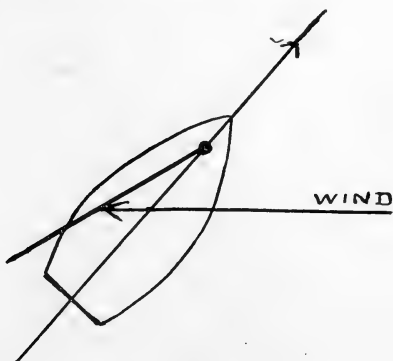


Fig. 1.

comparatively slight downward angle, and in this way can doubtless make head against a strong wind by soaring at a moderate incline. With an upward current of air the possibilities are wholly changed. Through such a current a bird might readily glide downward without descending at all in relation to the earth's surface. The downward motion through the air might suffice to render gravity an effective motive force and yet be so counterbalanced by the ascent of the air that the bird would remain at the same level above the earth. The air current need not rise vertically, but there must be some upward component in its direction, provided its motion be uniform, to make horizontal soaring possible.

The positions about the ship in which Mr. Brewster observed horizontal gliding present such a variety that at first sight it seems difficult to explain the presence of persistent ascending currents in all of them. And yet I believe that reasonable explanations are available in every case. The places noted were, (1) a short dis-

tance in front of the ship, (2) all along the windward side, (3) over the smoke-stack, (4) astern, directly over the wake.

Ascending currents of air must necessarily be produced by a ship steaming to windward, and two distinct causes will be concerned in their production. One is the diversion of the wind from its natural course, both laterally and upwards, by the great mass being forced through it. The other is the column of heated air and smoke rising from the smoke-stack which must cause to rise with it a considerable mass of the surrounding air.

Most of the diversion of the wind by the mass of the ship is probably lateral, but a fair proportion must be upwards. The point where the upward diversion would be most felt would presumably be just above the windward side of the diverting mass. But it would also extend a short distance to windward, for the ship must drive before it a sort of cushion of air suffering compression

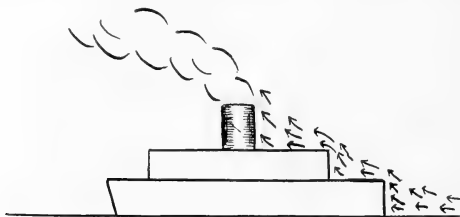


Fig. 2.

from the approaching obstruction. Although the point of maximum upward diversion is presumably just over the weather bow, there is probably an appreciable upward diversion from the propagated obstruction some distance in front and to windward of the ship (Fig. 2).

Mr. Brewster doubted the existence of rising currents where the birds were seen gliding fifteen or twenty feet above the upper deck on which the wind seemed to blow horizontally upon him. I think it is possible, and even probable, that while the wind swept the deck horizontally, it blew with an upward slant twenty feet higher; for in meeting the vertical forward end of the upper deck the air must have undergone some compression which reached a

maximum as the air rounded the corner, to be followed by expansion as it passed over the horizontal surface of the deck. The result of such expansion would be a divergent upward slant in that portion of the air which was at a slight distance from the deck.

On the leeward side of the ship the wind would probably cant downward to form an eddy. If this were so it would readily explain the avoidance of the lee side of the ship by the gulls.

Over the smoke-stack the ascending current must have been powerful, because of the heat. Its presence in the wake of the ship may be explained by the fact that the wind was not dead ahead but from a point and a half to two points off the port bow. As long as the volume of smoke and air poured from the funnel remained at a higher temperature than the surrounding air it must have continued to rise. And since such upward movement tends to be imparted to adjacent air it is probable that for a short distance to windward of the smoke an upward diversion of the wind occurred. With the wind blowing obliquely on the bow any given point in the wake must have been directly to windward of some point in the trail of smoke, namely, that portion of the smoke which was discharged when the boat was at the given point. The birds, although directly in the wake of the steamer, were directly to windward of a large mass of air and smoke, probably still warm and rising vigorously. They may well have been aided in this manner by rising currents for several hundred yards astern of the boat.

I do not claim that these suggestions cover all the factors involved in the explanation of the gliding Mr. Brewster describes. But I contend that the wind must have presented other than uniform horizontal motion to render the feat possible. Ascending currents caused in some of the ways I have suggested seem to me to present the easiest explanation that has occurred to me.

ADDENDUM.

Since writing this discussion my attention has been called to the papers on the subject by Lord Rayleigh, in which he discusses these points so clearly and concisely that my remarks seem almost

superfluous. In the first of these he says at the outset,—“I premise that if we know anything about mechanics it is certain that a bird *without working his wings* cannot, either in still air or in a uniform horizontal wind, maintain his level indefinitely.”

This states concisely my main contention. Subsequently he names two possible conditions of continued soaring in other than a downward direction; (1) ascending currents and (2) variations in velocity or direction in different portions of the air. In his discussion he devotes more attention to the second condition, and cites an example of observed flight which seems to exemplify this principle. I scarcely mentioned the possibility of explanation by this latter principle of irregularities in the wind, for though it occurred to me as logically conceivable, it seemed too improbable in the case described by Mr. Brewster to be worth dwelling on.

The references to Lord Rayleigh's papers are as follows:—“The Soaring of Birds.” *Nature*, Vol. XXVII, p. 534. 1883. (Collected Scientific Papers, No. 98, Vol. II, p. 194.)

“The Sailing Flight of the Albatross.” *Nature*, XL, p. 34. 1889. (Coll. Sci. Papers, No. 159. Vol. III, p. 267.)

“The Mechanical Principles of Flight.” *Manchester Memoirs*, Vol. XLIV, p. 1. 1900. (Coll. Sci. Papers, No. 257, Vol. IV, p. 462.)

LIST OF BIRDS COLLECTED IN THE TERRITORY OF
QUINTANA ROO, MEXICO, IN THE WINTER AND
SPRING OF 1912.

BY JAMES L. PETERS.

DURING the months of January, February, March and April, 1912, I accompanied the expedition of the Peabody Museum of Harvard University as representative of the Museum of Comparative Zoölogy.

My entire time was spent along the Hondo River, collecting on the Mexican side in the newly-formed Territory of Quintana Roo, although Messrs. R. E. Merwin and C. L. Hay, representing the Peabody Museum of American Archaeology and Ethnology made a trip of eleven weeks into the interior, crossing the border into Campeche.

The collection of about 375 skins representing 132 species of birds was made principally at two points along the Hondo River. The camps of the C. C. Mengel and Bro. Co of Louisville, Ky., cutting mahogany on a large concession thirty-six miles from the mouth of the river; known hereafter as Camp Mengel, and at Xcopen a small town about fifteen miles upstream from Camp Mengel.

Besides these two places, we made a short trip to Bacalar, but took few specimens.

With the exception of the week spent on the Bacalar trip, and a month (February 8-March 10) at Xcopen, my time was spent at Camp Mengel where circumstances were particularly favorable for tropical collecting, since a narrow gauge lumber railroad ran thirty miles northwest into the interior. The bush near the camp was rendered easily accessible by many foot paths, while a large *potrero*, clearings, and underbrushed woods all made progress easy and birds more readily approached and recovered.

At Xcopen there was only a muddy mule road and a trail along the river which could be followed. On both sides of these highways was thick jungle which made it both difficult to see and to recover birds.

The type of country covered during the entire four months was all very much the same, which in a way accounts for the comparatively small number of species secured. It may be roughly divided into two types; the river and the bush.

The river type consists of the row of mangroves bordering the river, and the open savannas, covered with water during the rainy season. The bush type is composed of the moist tropical jungle which often joins the river.

Birds typical of the river and open places were several species of Herons, Killdeer, Spotted Sandpiper, Ground Doves (*Champelea rufipennis rufipennis*) Kingfishers, particularly the Texas Kingfisher, Couch's Kingbird, Derby Flycatcher and Fork-tailed Flycatcher.

The more characteristic birds of the bush were the Chachalacas, Parrots, many of species undetermined, Cuckoos (*Piaya cayana thermophila*), Woodhewers, several species of Wrens, Jays (*Psilorhinus*) and Ant Tanagers.

The region is characterized by an almost complete absence of marked topographic features. There are no real hills, but instead a series of low limestone ridges, running north and south becoming higher as one ascends the river. The maximum elevation at Xcopen could not have been much over 200 feet above sea level.

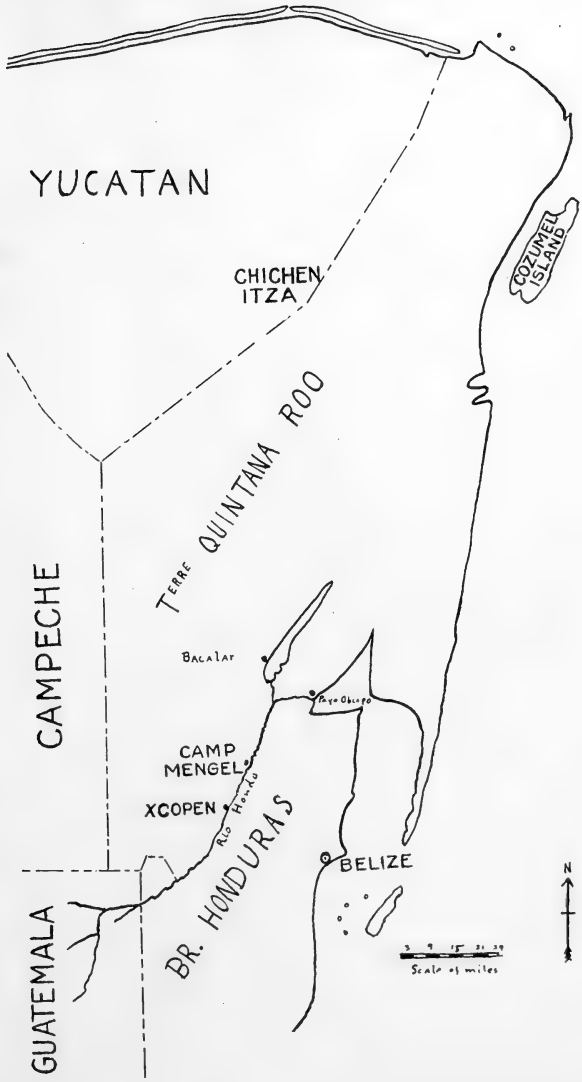
The climate consists of the usual wet and dry season. The former extending from June to November; the latter comprising the rest of the year. Sudden heavy downpours may be expected at most any time during the dry season however.

The temperature during our stay was for the most part quite agreeable, only occasionally going above 90° F. during the day, and seldom exceeding 80°. The coldest night was 49°.

Colors of birds in descriptions are from Ridgway's Nomenclature of Colors, edition of 1886. All measurements are in millimeters.

I wish to extend in heartiest thanks to the Mengel Co. for their generous hospitality and assistance during the long time that I was at their camp.

I also take this opportunity to thank Mr. Outram Bangs of the Museum of Comparative Zoölogy for much valuable advice and assistance, for without his constant aid this list would not have been possible.



YUCATAN

CHICHEN
ITZA

COZUMEL
ISLAND

TERRE QUINTANA ROO

CAMPECHE

BACALAR

PAYO OBISPO

CAMP
MENGEL

XCOPEN

BR. HONDURAS

Río Hondo

BELIZE

GUATEMALA

3 9 15 21 27
Scale of miles



Thanks are also due to the authorities of the U. S. National Museum and the Bureau of Biological Survey for the loan of specimens, including many types, needed for comparison.

In conclusion I take special pleasure in acknowledging my indebtedness to Mr. C. L. Hay, for without his generous interest it would have been impossible for a zoölogist to have accompanied this expedition.

LIST OF SPECIES.

ARDEIDÆ.

Hydranassa tricolor ruficollis (Gosse). 1, Hondo River near Camp Mengel, January 31.

Florida cærulea (Linn.). 3 ♂, Xcopen, Feb. 10 and March 3. Camp Mengel, April 24.

Butorides virescens virescens (Linn.). 3 ♀, 1 undetermined, Camp Mengel, January 31, February 7; Xcopen, February 18 and 24.

A bird (sex undetermined) taken at Camp Mengel, February 7, exhibits a rather peculiar phase of plumage. Crown, hind neck, auricular region, secondaries, and tail as in normal plumage; feathers of chin and throat dusky, edged with white; feathers of neck dusky with whitish median line; sides of neck rusty; greater, middle and lesser coverts and scapulars broadly edged with dark rusty; back dull greenish; breast dark smoky; abdomen smoky, the feathers edged with dull buff.

Nyctanassa violacea (Linn.). 1 ♂ on river near Camp Mengel, January 21.

FALCONIDÆ.

Accipiter bicolor schistochlamys Hellmayr. 1 ♂, Xcopen, March 3. Iris orange; legs and feet yellow.

Rupornis magnirostris conspecta, new subspecies.

5 both sexes, Camp Mengel, January 16, February 4, March 16 and 26, Xcopen, March 7.

Type from San Ignacio, Yucatan, no. 40,123, adult ♂, M. C. Z. Collected February 9, 1904, by L. J. Cole.

Characters. Similar to *Rupornis magnirostris griseicauda* Ridgway but smaller; much paler (smoke grey) above; slightly paler below.

No.	Sex	Locality	Wing	Tail	Tarsus	Culmen
40123	♂	Yucatan	218 mm.	159 mm.	62 mm.	17.5 mm.
40122	♀	"	231	169	65	18.5
15288*	—	"	228	172	66	18
60748	♂	Terre Quintana Roo	219	159	63	19
60749	♂	" " "	222	159	66	19
60747	♀	" " "	239	169	65	19
60746	♀	" " "	233	159	62	19.5
60745	♀	" " "	225	172	62	18

Of the five specimens collected, one is typical of the new form; the other four are intermediates more or less closely approaching it.

Herpetotheres cachinans (Linnæus). 2 ♂, Santa Lucia, January 22, Camp Mengel, February 4.

Regerinus uncinatus Illiger. 1 ♀, Camp Mengel, April 5. Iris white; lores and cere greenish; legs yellow.

Ictinia plumbea (Gmelin). 2 ♂, Camp Mengel, April 2 and 23. Iris red, bill and cere black, tarsus salmon.

Falco spaverius spaverius Linn. 3, both sexes, Camp Mengel, January 13, 16 and March 31.

Falco albicularis Daudin. 4, both sexes, Xcopen February 22, March 1 and 2, Camp Mengel, March 19. The bird shot March 19, was the ♂ of a pair apparently ready to breed. Iris hazel, cere and legs yellow.

CRACIDÆ.

Ortalis vetula intermedia new subspecies.

3, 1 ♂, 2 undetermined. Camp Mengel, January 20, March 12 and 20.

Type from Camp Mengel, *Terre Quintana Roo*, Mexico, no. 60644, adult ♂ M. C. Z. Collected March 12, 1912, by James L. Peters.

Characters. Similar to *O. v. pallidiventris* Ridg. but darker above; below neck and breast darker; abdomen light isabelline; thighs, flanks and under tail coverts fulvous; five outer pairs of rectrices tipped with isabelline.

No.	Sex	Wing	Tail	Tarsus	Culmen
60644	♂	181 mm.	225 mm.	62.5 mm.	23.5 mm.
60643	—	184	241	59.	26
60645	—	172	215	62.5	22

JACANIDÆ.

Jacana spinosa (Linnæus). A ♀ and one young bird, Xcopen, February 11. Legs grey; base of bill white; shield, bill and spur yellow.

CHARADRIIDÆ.

Oxyechus vociferus vociferus (Linnæus). 2 ♂, Camp Mengel, February 3; Xcopen, February 29.

SCOLOPACIDÆ.

Totanus flavipes (Gmelin). 2 ♂, Xcopen, February 16; Camp Mengel, April 24.

Melodromas solitarius solitarius (Wilson). 1 ♂, Xcopen, February 16.

Actitis macularia (Linnæus). 1 ♂, Camp Mengel, January 31.

COLUMBIDÆ.

Columba nigrirostris nigrirostris Scater. 1 ♀, 30 miles north of Camp Mengel, April 19.

Melopelia asiatica trudeaui (Audubon). 2 ♀, Camp Mengel, March 16 and 17. Iris orange; skin of face blue, legs and feet carmine.¹

¹ **Melopelia asiatica australis**, new subspecies.

Type from Cerro Santa Maria, Costa Rica. No. 21118, adult ♂. Bangs collection, collected January 9, 1908, by C. F. Underwood.

Characters. Similar to *M. a. trudeaui* (Aud.) but back scapulars and tertials a much richer brown (between Prout's brown and raw umber) which becomes less intense on the wing coverts. Upper tail coverts and middle pair of rectrices brown, deeper than the back.

Similar also to *M. a. asiatica* (Linn.) in the color of the lower throat, neck, and chest which are brownish-vinaceous, although less intense than in that form.

Bangs Collection.

No.	Sex	Wing	Tail	Tarsus	Culmen
16442	♂	152 mm.	113 mm.	26.5 mm.	21 mm.
21118	♂	158	110.5	23.5	19.5
21119	♀	150	112	22	19
21120	♂	161	110	26	21.5
21121	♀	155	111	24	19
21122	♂	160	112	24.5	18.5
21123	♀	156	113	23	19.5
21124	♂	157	114	22	18.5

All specimens of *Melopelia asiatica* from southern Mexico and Yucatan that I have examined undoubtedly belong to *M. a. trudeaui*. Representatives from Costa Rica, however, differ sufficiently to warrant their separation as a subspecies which may be called.

Chamepelia rufipennis rufipennis (Bonaparte). 5, both sexes, Camp Mengel, January 16, February 3, April 8. Xcopen, February 26, March 6.

Claravis pretiosa pretiosa (Ferrari-Perez). 2 ♀, Camp Mengel, February 3 and March 30.

STRIGIDÆ.

Strix virgata virgata (Cassin). 1 ♀, Camp Mengel, March 11.

Glaucidium phalænoides ridgwayi (Sharpe). 1 ♀, 15 miles north of Camp Mengel, March 23. Iris yellow; bill whitish.

PSITTACIDÆ.

Conurus aztec (Souancé). 3, both sexes, Camp Mengel, February 6 and March 20. Iris orange.

Pionus senilis (Spix). 2 ♂, Xcopen, February 26, Camp Mengel, April 8. Iris, legs and skin about eye orange.

CUCULIDÆ.

Piaya cayana thermophila Selater. 6, both sexes, Camp Mengel, January 14, February 4, February 6, March 17; Xcopen, February 14. Iris red.

Crotophaga sulcirostris Swainson. 3, both sexes, Santa Lucia, January 24; Xcopen, February 10, March 4.

CAPRIMULGIDÆ.

Nyctidromus albicollis yucatanensis Nelson. 3, both sexes, Camp Mengel, February 4 and 6, Xcopen, February 21.

ALCEDINIDÆ.

Ceryle alcyon alcyon (Linnaeus). 2, both sexes, Camp Mengel, January 21, Xcopen, February 24.

Ceryle torquata torquata (Linnaeus). 1 ♀, Camp Mengel, February 7.

Ceryle americana septentrionalis (Sharpe). 6, both sexes, Camp Mengel, January 31, Xcopen, February 24, 26 and March 4.

GALBULIDÆ.

Galbula melanogenia Selater. 1 ♂, Xcopen, March 4. Iris hazel, legs and feet yellow.

RHAMPHASTIDÆ.

- Rhamphastos carinatus** Swainson. 1 ♀, Camp Mengel, January 14.
Pteroglossus torquatus erythrozonus Ridgway. 3, both sexes, Camp Mengel, January 16 and 21. Xcopen, February 20. Iris lemon, skin of face red.
Aulacorhamphus prasinus (Lichtenstein). 3 ♂, Camp Mengel, March 11, 19 and 26.

PICIDÆ.

- Chloronerpes yucatanensis yucatanensis** (Cabot). 3, both sexes, Camp Mengel, March 30, April 1 and 3.
Centurus dubius (Cabot). 8, both sexes, Camp Mengel, January 13; February 1, 4; April 5 and 23. Xcopen, February 20, 28 and 29.
Scapanus guatemalensis guatemalensis (Hartl.). 2, both sexes, Camp Mengel, January 14 and April 23. Iris lemon.
Ceophlœus leucoramphus (Reichenbach). 1 undetermined, Camp Mengel, March 12.

TROGONIDÆ.

- Trogon melanocephalus melanocephalus** Gould. 4, both sexes, Santa Lucia, January 23; Xcopen, March 5; Camp Mengel, March 18. Naked eye-ring bluish white.

TROCHILIDÆ.

- Amizilis tzactl tzactl** (De la Llave). 5, both sexes, Santa Lucia, January 24; Xcopen, February 10-26.
Amizilis cyanocephala (Lesson). 1 undetermined, Camp Mengel, March 16.

DENDROCOLAPTIDÆ.

- Dendrocinclá anabatina anabatina** Sclater. 1 ♀, Camp Mengel, April 5.
Xiphorhynchus flavigaster flavigaster Swainson. 4, both sexes, Camp Mengel, March 19, 24, 28, and April 19.
Xiphorhynchus flavigaster yucatanensis Ridgway. 1 ♂, Camp Mengel, March 19.

Of the five specimens of *Xiphorhynchus flavigaster* collected, four were intermediate between *X. f. flavigaster* and *X. f. yucatanensis*, but apparently nearer to the former; the fifth was taken in the same grove and on the same day only a short distance from another bird also a ♂, which, of all

the intermediates most nearly resembled *X. f. flavigaster*. The fifth bird just referred to is essentially typical of *X. f. yucatanensis* in every respect.

Sittasomus sylvioides sylvioides Lafresnaye. 2, a ♂ and 1 undetermined, Xcopen, February 18 and March 2.

FURNARIIDÆ.

Synallaxis erythrothorax Selater. 1 ♀, Xcopen, March 1. Iris red.

Xenops genibarbis mexicanus (Selater). 1 ♀, 30 miles north of Camp Mengel, April 17.

FORMICARIIDÆ.

Formicarius moniliger intermedius Ridgway. 1 ♂, Xcopen, February 19.

Thamnophilus doliatus yucatanensis Ridgway. 6, both sexes, Xcopen, February 11, 13, 22; March 2; Camp Mengel, March 26; April 5. Iris lemon, feet and legs bluish.

COTINGIDÆ.

Tityra semifasciata personata (Jardine & Selby). 4, both sexes, Xcopen, February 28, March 3 and 4; Camp Mengel, March 25. Iris brown, feet and legs lead, base of bill and skin of face red.

Platypsaris aglaiæ sumichrasti Nelson. 1 ♀, Camp Mengel, March 31.

Attila citreopygus salvini Ridgway. 2, a ♂, 1 undetermined. 20 miles north of Bacalar, January 27; Camp Mengel, March 25. Eyes brown; tarus bluish.

PIPRIDÆ.

Manacus candei (Parzudaki). 5, both sexes, Xcopen, February 12, March 5; Camp Mengel, March 31. Legs orange.

TYRANNIDÆ.

Muscivora tyrannus (Linnæus). 4, both sexes, Camp Mengel, January 31; March 15-31.

Tyrannus melancholicus satrapa (Cabanis and Heine). 5, both sexes, Camp Mengel, January 15 and 21; March 11, Xcopen, February 24 and 29.

Pitangus sulphuratus derbianus (Kaup). 4, both sexes, Santa Lucia, January 22; Camp Mengel, February 1; March 15 and 28.

Myiodynastes luteiventris Selater. 2 ♂, Camp Mengel, April 5 and 23.

Myiarchus lawrenceii lawrenceii (Giraud). 3 ♂, Camp Mengel, February 3 and March 17; Xcopen, March 1.

Myiarchus magister nelsoni Ridgway. 3, 2 ♂, 1 undetermined, Xcopen, March 7; Camp Mengel, March 26, April 7.

Sayornis phœbe (Latham). 1 ♀, Camp Mengel, March 11.

Empidonax minimus (Baird). 5, both sexes. Santa Lucia, January 24; Xcopen, February 17–March 5; Camp Mengel, March 30.

Myiochanes brachytarsus (Scalater). 3 both sexes, Camp Mengel, January 14, February 3 and March 17.

Myiochanes virens (Linnæus). 1 undetermined, 30 miles north of Camp Mengel, April 20.

Myiobius xanthopygus sulphureipygius (Scalater). 1 ♂, 30 miles north of Camp Mengel, April 18.

Pyrocephalus rubinus blatteus Bangs. 3, both sexes, Camp Mengel, January 17 and February 1; Xcopen, February 10.

Description of adult ♀ taken February 10 at Xcopen. Similar in general coloration to adult ♀ of other forms of *P. rubineus*, but the upper parts distinctly tinged with vinaceous, strongest on the head and rump. Abdomen, flanks, thighs and undertail coverts a brilliant scarlet-pink, shading to rose pink on the lower breast and bend of the wing. Wing 71 mm.; tail 56.3 mm.; tarsus 18.1 mm.; culmen 13.4 mm.

Pipromorpha assimilis assimilis (Scalater). 1 ♀, Xcopen, March 5.

Myiozetetes texensis texensis (Giraud). 4, both sexes, Camp Mengel, February 6, March 31, April 8; Xcopen, February 20.

Legatus albicollis variegatus (Scalater). 1 ♀, Camp Mengel, March 31.

Elænia martinica subpagana (Scalater and Salvin). 2 ♂, Xcopen, February 15; Camp Mengel, March 17.

Rhynchocyclus cinereiceps (Scalater). 2, both sexes, Camp Mengel, March 18 and April 13. Iris greyish white.

Craspedoprion brevirostris (Cabanis). 1 ♀, 30 miles north of Camp Mengel, April 18.

Tidirostrum cinereum finitimum Bangs. 2, both sexes, Xcopen, March 2; Camp Mengel, April 9. Iris yellowish, tarsus bluish.

MIMIDÆ.

Mimus gilvus gracilis (Cabanis). 3, both sexes, Camp Mengel, January 20 and March 19.

Dumetella carolinensis (Linnæus). 1 ♂, Xcopen, February 14.

TURDIDÆ.

Planesticus grayi grayi (Bonaparte). 2 both sexes, Camp Mengel, March 31 and April 5.

Hylocichla mustelina (Gmelin). 1 undetermined, Xcopen, March 7

SYLVIIDÆ.

Polioptila superciliaris superciliaris Lawrence. 1 ♀, Camp Mengel, April 6.

TROGLODYTIDÆ.

Nannorchilus leucogaster brachyurus (Lawrence). 2, both sexes, Xcopen, March 4; 30 miles north of Camp Mengel, April 17.

Henicorhina prosthaleuca prosthaleuca (Sclater). 1 ♂, Camp Mengel, April 3. Iris brown.

Troglodytes musculus hypædon (Sclater). 2 ♂, Camp Mengel, March 13 and 19.

Examination of the type and one other specimen of *Troglodytes irrequies* Bangs and Peck, with a series of *T. m. hypædon* seems to show that *T. irrequies* is probably not sufficiently distinct to warrant its separation even as a subspecies of *T. m. hypædon*.

Pheugopedius maculipectus maculipectus (Lafresnaye). 4, both sexes, Xcopen, February 17, 23, March 8; Camp Mengel, April 3. Iris red brown, tarsus bluish.

CORVIDÆ.

Psilorhinus mexicanus cyanogenys (Sharpe). 4, both sexes, Xcopen, February 25 and 29; Camp Mengel, April 1.

These birds are slightly smaller than *P. m. cyanogenys*, but they lack the much whiter underparts of *P. m. vociferus* (Cabot).

VIREONIDÆ.

Pachysylvia decurtata (Bonaparte). 2 ♂, Camp Mengel, March 18 and 28.

Vireo ochraceus Salvin. 1 ♂, Xcopen, February 20. Iris greyish white.

Vireo griseus griseus (Boddart). 4, both sexes, Xcopen, February 17, 23, March 2; Camp Mengel, March 15.

Vireosylva flavoviridis flavoviridis Cassin. 2 ♂, Camp Mengel, March 28 and April 13.

HIRUNDINIDÆ.

Iridoprocne albilineata (Lawrence). 2, both sexes, Camp Mengel, February 1 and March 11.

Stelgidopteryx serripennis (Audubon). 3, both sexes, Camp Mengel, January 16 and March 13.

Progne chalybea chalybea (Gmelin). 3, both sexes, Xcopen, February 15; Camp Mengel, March 19 and 20.

MNIOTILTIDÆ.

Mniotilta varia (Linnæus). 2 ♂, Camp Mengel, March 25 and April 1.

Helinaia swainsoni Audubon. 1 ♀, Santa Lucia, January 24.

This specimen constitutes the first record for any part of southern Mexico. A ♀ was taken on Swan Island, Caribbean Sea, by George Nelson, March 1, 1912. (Coll. M. C. Z. no. 58195.)

Helmitheros vermivorus (Gmelin). 1 ♀, Xcopen, March 8.

Dendroica æstiva æstiva (Gmelin). 3 ♂, Camp Mengel, January 17 and March 17; Xcopen, February 15.

Dendroica magnolia (Wilson). 9, both sexes: Santa Lucia, January 23; Xcopen, February 12–March 7; Camp Mengel, March 18–April 3.

Dendroica tigrina (Gmelin). 1 ♂, Camp Mengel, March 13. Ridgway (Birds of North and Middle America, Part II, p. 538) gives for Yucatan, "One record only" and none for any other part of Mexico. This bird therefore establishes another record for Mexico.

Dendroica coronata (Linnæus). 3, both sexes, Camp Mengel, January 17–March 25.

Dendroica fusca (Müller). 1 ♂, 30 miles north of Camp Mengel, April 19.

Dendroica dominica albiflora Ridgway. 1 ♂, Xcopen, February 28.

Seiurus noveboracensis notabilis Ridgway. 1 ♂, Camp Mengel, April 9.

Geothlypis trichas brachidactyla (Swainson). 8, both sexes; Camp Mengel, January 13–April 7; Xcopen, February 10.

Chamæthlypis poliocephala palpebralis Ridgway. 6, both sexes, Camp Mengel, February 3–April 9.

Icteria virens virens (Linnæus). 1 ♀, Xcopen, February 11.

Wilsonia citrina (Boddart). 2 ♂, Camp Mengel, January 17 and March 26.

Setophaga ruticilla (Linnæus). 4, both sexes: Xcopen, February 16–March 4; Camp Mengel, March 16.

Basileuterus culicivorus culicivorus (Lichtenstein). 1, sex undetermined, Camp Mengel, March 25.

CÆREBIDÆ.

Cyanerpes cyanea carneipes Oberholser. 1 ♂, Camp Mengel, March 30.

ICTERIDÆ.

Gymnostinops montezuma (Lesson). 1 ♀, Camp Mengel, January 14.

Amblycercus holosericeus (Lichtenstein). 3, both sexes, Camp Mengel, January 13; Xcopen, February 17 and 22.

Cassidix oryzivora mexicana (Lesson). 2 ♂, Camp Mengel, March 24.

Tangavius involucratus (Lesson). 7, both sexes: Xcopen, February 10-22; Camp Mengel, April 13.

Dives dives (Lichtenstein). 5, both sexes, Camp Mengel, January 20 and April 8; Xcopen, February 18-22.

Icterus prothemelas (Strickland). 4, both sexes, Xcopen, February 19 and March 3; Camp Mengel, March 31.

Icterus spurius (Linnæus). 8, both sexes, Payo Obispo, January 29; Xcopen, March 3; Camp Mengel, March 16-April 5.

Icterus gularis yucatanensis Berlepsch. 1 ♂, Camp Mengel, February 6.

Icterus mesomelas mesomelas (Wagler). 4, both sexes, Camp Mengel, January 21-April 23; Xcopen, February 19.

Agelaius phœniceus richmondi Ridgway. 11, both sexes, Camp Mengel, January 16-February 3; March 11-April 13.

These birds were common in a large savanna near Camp Mengel, but were not seen at other points along the river. None of the birds shot showed any sign of breeding, although singing males apart from the flocks were taken from time to time in hopes of securing residents.

TANAGRIDÆ.

Euphonia hirundinacea Bonaparte. 2, both sexes, Camp Mengel, March 16 and April 1.

Euphonia gouldi Selater. 1 ♀, Camp Mengel, February 6.

Tanagra cana diaconus Lesson. 3, both sexes. Camp Mengel, March 15-17.

Tanagra abbas Lichtenstein. 5, both sexes. Camp Mengel, March 11-April 13.

Piranga rubra rubra (Linnæus). 1 ♀, Xcopen, March 7.

Phlogothraupis sanguinolenta sanguinolenta (Lesson). 4, both sexes, Xcopen, February 17 and 20; Camp Mengel, March 17 and April 23. Iris red brown.

Lanio aurantius Lafresnaye. 1 ♂, 30 miles north of Camp Mengel, April 14.

Phœnicothraupis rubica nelsoni Ridgway. 2, both sexes, Camp Mengel, March 11 and April 20.

Neither of these specimens represents typical *nelsoni*; the male is duller than any representative of this subspecies examined, while the female more nearly resembles *P. r. rubicoides* (Lafr.) particularly in the color of the underparts which are dull ochraceous instead of pale buffy.

Phœnicothraupis salvini salvini Berlepsch. 5, both sexes. Xcopen, February 23-March 7; Camp Mengel, April 3.

FRINGILLIDÆ.

Saltator magnoides magnoides Lafresnaye. 1 ♂, Xcopen, March 8.

Saltator grandis grandis (Lichtenstein). 1 ♀. Xcopen, March 3.

Saltator atriceps raptor (Cabot). 2, both sexes, Camp Mengel, March 24 and April 13.

The Yucatan form of *Saltator atriceps* was originally described by S. Cabot Jr. (Journal Boston Soc. N. H., v, 1844, 90, pl. 12) as *Pyrrula raptor*. It differs from *S. a. atriceps* in having the breast and abdomen much paler gray and the flanks almost lacking any olivaceous wash. The birds average about the same size as *S. a. atriceps*. The constantly lighter color of the underparts of *S. a. raptor* is very striking in the series examined.

Caryothraustes poliogaster poliogaster (Du Bus). 2 ♂, 30 miles north of Camp Mengel, April 20-21.

Cardinalis cardinalis flammiger, new subspecies.

3, both sexes, Xcopen, February 13, March 4 and 8. Type from Xcopen, Territory of Quintana Roo, Mexico, no. 60629 adult ♂ M. C. Z. Collected March 8, 1912, by J. L. Peters.

Characters. Adult ♂ resembling most nearly *C. c. yucatanensis* Ridgway but slightly larger; bill longer, relatively more slender. Color of underparts between geranium red and scarlet vermilion instead of scarlet and scarlet vermilion.

Adult ♀ similar to adult ♀ of *C. c. yucatanensis* except that the back is bistre brown instead of raw umber.

No.	Sex	Wing	Tail	Tarsus	Culmen
60629	♂	85.5 mm.	106.1 mm.	25.5 mm.	18.5 mm.
60630	♀	79.5	96.8	24.5	18.
60631	♀	78.8	102.8	24.5	17.2

Zamelodia ludoviciana (Linnæus). 2, both sexes, Camp Mengel, March 15.

Guiraca cærulea cærulea (Linnæus). 4, both sexes, Xcopen, February 28 and March 8; Camp Mengel, April 1.

Passerina cyanea (Linnæus). 2, both sexes, Camp Mengel, January 13 and March 25.

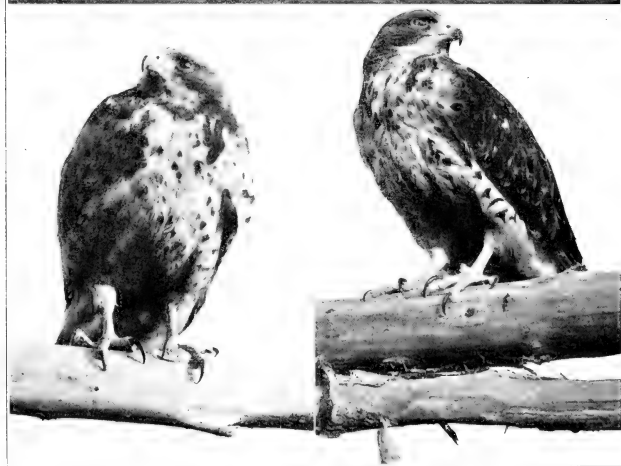
Sporophila moreletti (Bonaparte). 6, both sexes. Camp Mengel, January 13-February 1, March 31; Xcopen, February 12-March 7.

Volatinia jacarini splendens (Vieillot). 4, both sexes, Camp Mengel, February 1-6, April 6-7.

Arremonops chloronotus (Salvin). 4, both sexes, Camp Mengel, January 14; Xcopen, February 14-20.

Melospiza lincolni lincolni (Audubon). 1 ♂, Camp Mengel, January 15.

Spiza americana (Gmelin). 2 ♂, Camp Mengel, April 5.



SWAINSON'S HAWK (*Buteo swainsoni*).

1. Nestlings Three Weeks Old. 2. Eight Months Old. 3. One Year Old.

NOTES ON SWAINSON'S HAWK (*BUTEO SWAINSONI*)
IN MONTANA.

BY E. S. CAMERON.

Plates XII and XIII.

II. FOOD.

IN his standard work on 'The Hawks and Owls of the United States' Dr. A. K. Fisher, gives a summary of eighteen stomachs of Swainson's Hawk examined by him as follows: "Seven contained small mammals; eight, insects; three, reptiles; three, batrachians, and three were empty." My own conclusions, from observations made at fourteen nests, are that Swainson's Buzzard prefers frogs, grasshoppers, and mice, in the order named to any other food when it can get them. Grasshoppers form the staple sustenance of these hawks in Montana. In common with all birds, however, the hawk's food habits vary with season and locality, and in spring, when its favorite prey is unobtainable, small birds and cotton-tail rabbits (*Lepus artemisiæ*) are attacked. As regards the former, Lark Buntings (*Calamospiza melanocorys*), which were often exceedingly numerous around the nesting site, are, in my experience, the only species ever taken — the color and soaring habits of the males rendering them peculiarly conspicuous. 'Cotton-tails,' now very scarce owing to an epidemic amongst them, were at one time remarkably abundant, and fell frequent victims to buzzards and Great Horned Owls. One of these small hares, weighing under three pounds, which dart for their nearby holes at lightning speed upon the first alarm, was found in the nest of a Swainson's Hawk, and testified thereby to the venatorial skill of its capturer. In Alaska Mr. Dall found the bones of rabbits, squirrels and ducks in the nest of Swainson's Hawk,¹ but I have never known any prairie dogs, poultry, or game birds, to be taken by it. Constant observation was kept upon a pair of Swainson's Hawks which nested in my vicinity in 1908 and 1909 by my wife,

¹ North American Birds, Vol. III, p. 269.

myself, and the herd-boy above mentioned. The young birds were fed chiefly upon grasshoppers with occasional mice, frogs, and snakes. Whenever my wife or I visited them their crops were crammed with the first named. The herd-boy, who had the best opportunities for observation, as much of his time was spent near the nesting site,—told us that the female continually brought frogs and occasionally snakes. He once saw her seize on the ground, and bear to the eyrie, a Lark Bunting which she captured by stooping from a height like a falcon. At this nest, during the two years which we observed it, the above was (so far as we knew) the only time that the young hawks were regaled with a feathered prey. Unless I actually saw the parents bring food, I could only infer its nature from the excretions and pellets, as nothing edible was ever found in the nest. This was situated upon a creek with many reed fringed, frog-haunted pools, and it was, therefore, natural that next to grasshoppers the amphibians should be the most frequent prey. The more shy male did not bring food so often as his mate (at least when intruders were present), although I once flushed him off the eggs. Swainson's Hawk is a voracious feeder, and on June 27, 1893, I shot a female of this species whose stomach contained an entire Lark Bunting. Even the unfledged young will swallow mice and frogs whole. Like its great cousin, the Golden Eagle, this hawk is very partial to snakes, but sometimes the snake proves too much for its captor, as in the following instance kindly narrated to me (in lit) by Mr. W. R. Felton — a civil engineer for the Chicago, Milwaukee and Puget Sound Railway. On August 31, 1910, his slowly moving freight wagons were winding up a trail by the Little Dry River to another camp site. The instrument man, Mr. M. H. Devine, brought up the rear about a mile behind the van, when his attention was attracted to a large hawk which fell swiftly through space to the ground apparently with a broken wing. His curiosity being excited, he at once walked towards it, but, when about sixty-five yards off the disabled hawk succeeding in rising to a considerable height. As he watched it, to his great surprise, the hawk again fell headlong, this time into the middle of the river, impelled by some mysterious agency. The bird managed to struggle to the bank, and upon being lifted from the water was found to be a Swainson's Hawk with a garter snake

(*Eutaenia sirtalis*) firmly coiled around one wing. Both hawk and snake were unfortunately killed; neither does any harm, and they are useful to destroy the ubiquitous mice. In fact the snake disgorged a partly digested mouse when withdrawn from the water. So tightly did the reptile (which measured twenty-eight inches) encircle the hawk's wing, that it could not be pulled away and had to be gradually unwound. Dr. Holland mentioned to Seebohn an instance in Pomerania of a female buzzard (*Buteo vulgaris*) which represents the American *B. swainsoni* having been found dead on the nest with a live viper under her.¹

It has been universally considered by ornithologists that members of the subgenus *Buteo* never chase birds on the wing, but I believe all buzzards which stoop to a feathered prey will occasionally do so when driven by hunger, or incensed by the disappointment of missing the bird on the ground. The distinguished ornithologist, Coues, referring to Swainson's Hawk wrote: "Though really strong and sufficiently fierce birds I scarcely think they are smart enough to catch birds very often."² For my own part, I believe that their failure "to catch birds very often" proceeds more from disinclination than inability to do so. Where locusts, mice and frogs are exceedingly abundant, as is usually the case here, these indolent hawks which would "rather snatch stealthily than capture in open piracy"³ are reluctant to exert themselves to hunt the more agile game. I have only once myself seen a Swainson's Hawk in pursuit of a flying bird, although such a chase must not infrequently occur when the hawk is famished or ground game is scarce or absent. In this flight, at any rate, the hawk acquitted herself with considerable dash, and, so far as I know, has added a new record to the hitherto published history of the species. During August, 1909, I saw the female of the pair of Swainson's Hawks which had been under observation, and whose young had then flown, make a determined stoop at a Lark Bunting (*Calamospiza melanocorys*) on the ground. The quarry crouched under the lowest wire of a protecting fence, and there was no wind to aid the hawk which was obviously so hungry that her valor over-

¹ British Birds, Vol. 1, p. 120.

² Birds of the Northwest, 1874, p. 358.

³ Coues *op. cit.*

came her discretion. The consequence was that she just missed the bird but collided with the fence, and, losing her balance, fell over. The terrified bunting was the first to recover its wits, and justified its name by soaring straight upwards like a true lark before it flew swiftly away. To my great astonishment the flustered hawk rose in the calm air and flapped after the now distant bunting. With steady beats of her long wings she appeared to be making but slow progress, whereas, in reality, her speed was more than double that of the fugitive, and she soon overtook it. When, as it appeared to me, about a yard above her quarry, the hawk made a sudden dash to seize the bunting in her claws, which the latter cleverly evaded and then flew off in a different direction. Being assailed only by a clumsy buzzard, which could not "throw up" like a falcon, the little bird escaped rejoicing, although by a narrow margin. The entire absence of wind greatly impeded the hawk, and prevented her from sweeping up to her quarry in the first instance, while causing her to flap heavily during all the time of the pursuit, and when endeavoring to recover herself after the attack. It was clear to me that, had there been a breeze, the result would have been widely different, as Swainson's Hawk is a bird of powerful flight — in some specimens the tips of the long folded wings extending beyond the tail. Upon subsequent reflection I was not so much surprised by this valiant flight so contrary to the usual accepted estimate of *Buteo*. Field naturalists often generalize upon insufficient data, and the many misleading accounts of the Golden Eagle (*Aquila chrysaetos*) which is only a large buzzard, at once come to mind. It has often been depicted as of a cowardly nature, subsisting exclusively on carrion, or on small mammals and birds which it always seizes on the ground. As regards the charge of cowardice (if I may be pardoned a digression) no one can read the accounts of this eagle in Turkestan and Russia where it is flown at deer, antelope, wolves, and sometimes the bustard, as given by Mr. J. E. Harting in his 'Hints on the Management of Hawks' without being thrilled with admiration at the bird's prowess. Mr. Harting gives the translation of a letter (op. cit. p. 185) he received from the late Mr. Constantine Haller, President of the Russian Falcony Club at St. Petersburg, who referring to the flights of the eagle at wolves remarks: "It sometimes happens that,

if its stoop be true, it will split the skull of a fox at one blow, and its strength is such that it can easily knock over a young wolf, or a sheep. Even a Kirghiz in the saddle (so the natives say) cannot resist it if it comes at him on the wing. This unfortunately happens sometimes if the Eagle misses its prey. To fly at a wolf the largest and strongest bird is selected. It stoops again and again at the beast, eventually seizing it by the head and neck. Occasionally the wolf contrives to shake off the bird with a frantic effort, or by rolling on the ground; but if it has a good start and goes away full speed, the falconer follows on horse-back and helps his bird to kill the quarry." It is also asserted by the Kirghiz that wild eagles "will attack and kill the wolf" (p. 170).

As regards the capture of flying birds by the Golden Eagle: my brother Mr. Allan Gordon Cameron, has frequently described an eagle on the Island of Jura, Scotland, "hawking grouse just as a peregrine will do," and, on one occasion the royal bird in full chase of a grouse passed within a few feet of his head as already related in 'The Auk.' Moreover Mr. Seton Gordon has conclusively shown that this splendid raptor easily cuts down flying ptarmigan with a blow from its wing. In Montana, a Golden Eagle has been observed to attempt the capture of a wild goose (*Branta canadensis*) from a northward-bound flock.¹

The Harrier (*Circus cyaneus*) which is not specifically distinct from the Marsh Hawk (*Circus hudsonius*) is considered the most ignoble of hawks and about the least likely to strike down a flying quarry. Nevertheless, I have myself observed the latter to chase birds on the wing, and Dr. A. K. Fisher has seen it do so "in a few instances."²

In the review of a Persian treatise on falconry translated by Colonel Phillott, we read: "Our Persian prince, however, succeeded in training one (a harrier) to take a *Chukor*, or Red-legged partridge, and on a second occasion, when in Baghdad, he wagered a valuable mare with some local sportsmen that within the space of fifty days he would reclaim a harrier, and successfully fly it at wild quarry. He flew it in the presence of his friends, and took with it a black partridge (or francolin), a quail, and a rail."³

¹ See Auk, XXV, 1908, pp. 258-259.

² Hawks and Owls of the United States, p. 28.

³ London Field, April 10, 1909.

A flight by any kind of wild eagle or hawk is rarely witnessed, even by those persons, who, by reason of a lifelong familiarity with the raptors in their haunts enjoy special opportunities for seeing it. Of the Red-tailed Buzzard (*Buteo borealis*) which in its second plumage bears a strong resemblance to a Swainson's Hawk of the same age, and does not surpass (even if it equals) the latter in flying powers, Dr. A. K. Fisher has written: "On one occasion the writer saw one of these birds stoop at a crow which had just been shot. During the descent the crow made considerable commotion, which evidently attracted the Hawk, for with a swiftness of flight that would have done credit to the Duck Hawk, it struck the crow just as it reached the ground."¹ The above is very different behavior to the usual conception of this bird.

III. PLUMAGE.

The first plumage of Swainson's Hawk has been admirably described by the distinguished ornithologist, Coues and other writers. As regards the subsequent plumage changes, however, it appears to me that much confusion has arisen; nor is this to be wondered at when it is considered that immature birds, both male and female of the same age, exhibit endless differences in coloration. In an authoritative work on birds the following passage occurs: "The Buzzards have usually been placed next the Eagles, with which they have many points in common; but they differ, among other things, in assuming, it is said, the adult plumage after the first moult, whereas it takes several years for the Eagles to attain full plumage."²

While the above may possibly apply to some species of buzzards, it is certainly incorrect in the case of *Archibuteo ferrugineus*, *Buteo borealis calurus*, and *Buteo swainsoni*, all of which I have kept in domestication. To the two former I will again refer, and at present deal only with the latter. In my opinion, at least four distinct plumage changes can be traced in normal individuals of this species — in other words, the adult dress is assumed at about four and a

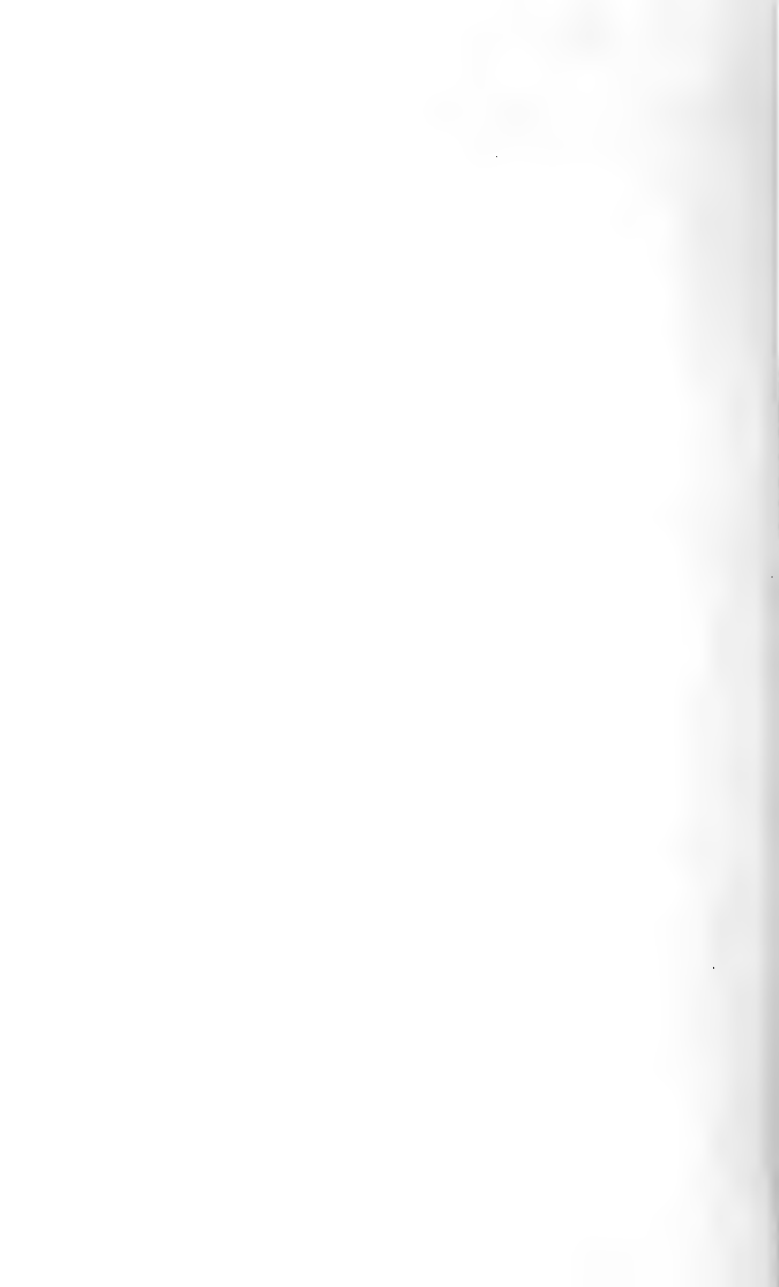
¹ Hawks and Owls of the United States, pp. 48-49.

² Birds of The World. Frank H. Knowlton. 1909.



SWAINSON'S HAWK (*Buteo swainsoni*).

1. Adult, Four Years Old. 2. Two Years Old. 3. One Month Old.
(1 and 2 from mounted specimens.)



half years old. To begin at the beginning: the nestlings are hatched covered with fluffy down, but at first show much pink about the head, where the down is absent.

In two weeks black feathers are mixed with the white down, and at three weeks old the birds are nearly full-feathered, their heads and breasts alone showing white. (See Pl. XII.) As at this age they are physically unable to stand up, it is impossible to obtain an artistic picture. At a month old the nestlings are full-fledged, but still occupy their nest, although the females, which are more precocious, can fly well in a wind after a few attempts. The latter may be recognized by their larger size and more spirited demeanor.

FIRST MALE PLUMAGE.

The first plumage common to both sexes is retained for a year. Until my tame hawk had finished his moult, in October, his appearance coincided exactly with the 'young of the year' so ably described by Coues as below. (See photo of hawk at eight months old.) "Entire upper parts dark brown, everywhere varied with tawny edgings of the individual feathers. Under parts, including lining of wings, nearly uniform fawn-color (pale dull yellowish-brown), thickly and sharply marked with blackish-brown. These large dark spots, for the most part circular or guttiform, crowd across the forebreast, scatter on the middle belly, enlarge to cross-bars on the flanks, become broad arrow-heads on the lower belly and tibioe, and are wanting on the throat, which is only marked with a sharp, narrow, blackish penciling along the median line. Quills brownish-black, the outer webs with an ashy shade, the inner webs toward the base grayish, paler, and marbled with white, and also showing obscure dark cross-bars; their shafts black on top, and nearly white underneath. Tail-feathers like the quills, but more decidedly shaded with ashy or slate-gray, and tipped with whitish; their numerous dark cross-bars show more plainly than those of the quills, but are not so evident as they are in the old birds."¹ The legs, feet, gape and cere are chrome yellow, the

¹ Key to North American Birds, p. 547, Ed. 1887, and Birds of the Northwest, p. 359.

claws black, and the bill slate color. The irides in the newly fledged young are blue gray which soon changes to pale hazel. Fledglings vary in the shade of yellowish-brown, amount of white, and number of spots on the under parts. The spots apparently darken with age until the moult, as my tame hawk became gradually more and more chestnut.

SECOND MALE PLUMAGE.

The moult was begun on April 9, when the bird was kept in a large specially made cage so that I could collect his feathers and observe the order of losing them. He began by shedding his quills — the inner primaries (seventh in each wing) being the first to fall out. By April 29, I had picked up five primaries and four secondaries when the hawk ceased temporarily to lose any more feathers. On May 8 he commenced to moult the feathers of the wing coverts, but as he pulled all the smallest in pieces it was impossible to keep an accurate count of these. On May 26, the new centre tail feathers were observed to be growing down above the ten old rectrices possessed by the hawk, which, however, had eleven when clean moulted. (Two other examples of the same age had eleven rectrices each). On June 8, the two old centre tail-feathers fell out, and on the 9th and 10th three more rectrices were lost. At this date the bird displayed a mixed bi-colored tail of old and new feathers when, as pointed out by Coues¹ the new tail-feathers and quills were strongly slate-colored in striking contrast to the dark brown old ones. During the three days above mentioned the hawk also lost a primary and several feathers of the wing coverts, which, as usual, he tore in fragments. On July 3 he shed another primary when he was again given his liberty. The moult extended over a period of six months, and the outer or first primaries were the last feathers to be shed, as is the case I believe with all raptors.

This tame hawk moulted into a plumage in many respects similar to that worn during the first year. With the exception of a white occiput, and nearly white "flags," the whole of the

¹ Key to North American Birds, 1887, p. 546.

head, neck and underparts became rich cream color. To be very precise, the shade exactly matched the pale side of a Graham biscuit as sold in cartons by grocers. The spots had all disappeared excepting a few arrow-heads and longitudinal bars on the upper breast, and some others on the sides which were mostly concealed by the wings. The upper parts appeared to be much lighter than before, although the ground color was only a shade less dark than the chocolate brown of the first plumage. This light effect was produced by a border of white and chestnut, or white alone, which replaced the tawny edgings to the feathers of the back and wing coverts. Some of the secondaries were pure white. The crown, sides and back of the neck were streaked with the dorsal brown. The underside of the wing was of three shades. From the wrist downwards for five inches it was the cream color of the breast, then became a silvery gray to the end of the secondaries (seven inches more), which was merged into five inches of blackish brown constituting the primary tips. The wings were thus seventeen inches long, and extended for six eighths of an inch beyond the tail — although in a wild example of the same age they exceeded it by one and one half inch. The tail feathers were all tipped with white, the upper tail coverts being also of this color, variegated with mixed brown and chestnut bars. I am fully convinced that the young bird from the Rocky Mountains (10, 761) described in *North American Birds*, Vol. III, p. 264, also *Buteo swainsoni*, var. *oxypterus* normal young plumage, p. 266–267 op. cit. of which an illustration is given, are both examples of Swainson's Hawk in the second plumage. In fact, the description of the young female var. *oxypterus* (33508) p. 367, would fit my tame bird after moulting with but slight alteration. As the spots of the underparts may or may not persist in the second plumage, they are not to be relied upon as an indication of age.

I may here remark that my Swainson's Hawk in second plumage bore a striking resemblance to a Western Red-tail of the same age (three of which I reared from two different nests) when both were seen from behind. The only points of difference were in the brown tail and much shorter wings of the Red-tail, which undoubtedly has four parallel plumage changes to *B. swainsoni* before becoming adult.

THIRD MALE PLUMAGE.

My hawk was unfortunately lost in 1910, which prevents me from proving absolutely from a captive specimen that the following conclusions regarding the third dress assumed, are correct. Nevertheless, I believe that I can present a fairly accurate account of the subsequent plumage changes in this species, based upon a study of thirty skins and hundreds of wild birds. It must always be recollected that, as some individuals differ remarkably in plumage from the congeners of the same age, allowance has to be made for these dissimilarities. For example, in both sexes the chief second plumage variation consists, apparently in the retention or extinction of the spots on the underparts which form so conspicuous a feature in all birds of the year. In the third male plumage the whole of the upper parts are light umber brown with the head of a darker shade. Many feathers of the back and scapulars are chestnut-edged, but the white margins of the second plumage have disappeared. The primaries are brownish-black above becoming ashy, or pale slate, towards their bases on the inner webs, and slate color beneath, gradually blackening near the tips. The entire upper breast is bright cinnamon with a purplish bloom, and it is in this plumage that the white throat first appears, in strong contrast to the cinnamon upper breast and sooty brown head. In three examples before me this white patch measures two and a half inches long by one and a half inches wide. The ventral surface and lining of the wings are buffy white, slightly flecked or broadly splashed (according to the specimen) with a paler tint of the breast color. The newly-grown light slate tail-feathers have eight dark bars, and are a still paler shade of slate below, but fade to brown before the next moult on the exposed parts. The two upper rectrices always turn more or less brown except at their bases which are protected by the secondaries in the folded wing. If the former are raised, the original slate-colored tail is disclosed.

FOURTH MALE PLUMAGE.

In the fourth male plumage which resembles the third, and bears the same relation to it as the second does to the first, the bird becomes lighter everywhere. The whole of the underparts are white, and the broad cinnamon band of the upper breast is reduced to a narrower one of white-spotted chestnut, against which the immaculate white throat is less sharply defined than in the third plumage. The head is smoke color, or ashy, the occiput white, and the upper parts always, in my experience, either pale buffy brown, brownish ash, or bluish ash, but never dark brown as described by some ornithologists.

In Fisher's 'Hawks and Owls of the United States,' p. 78, 1893, Knight's 'Birds of Maine' (p. 230, 1908), and Knowlton's 'Birds of The World' (p. 257, 1909), one plumage phase of the normal adult male is, in my opinion, correctly given as "grayish brown," but no reference is made in ornithological works to the other color forms of bluish ash and buffy brown. Dr. Jonathan Dwight, Jr. was good enough to comment on a paper of mine on the plumage of *B. swainsoni* published in 'The Auk' (Vol. XXV, p. 468), remarking in 'Bird Lore' (Vol. X, p. 267): "The gray birds may change to brown through wear just as the loss of the "frosting" of some Terns' feathers produces blacker wings." I have myself come to the conclusion that this is probably what occurs, and that from the effects of wear and light on the feathers the ash colored birds become browner. I am the more inclined to adopt this view because, as above mentioned, in all specimens examined by me the tail has faded to brownish whenever exposed to weather or light, while its covered portions retain their pristine ash or slate-color untarnished. Otherwise the three color forms of buffy brown, bluish ash, and brownish ash can only be explained by dimorphism. As Swainson's Hawk is so widely distributed in its breeding range, which extends from Alaska to Chile, normal adults from different localities might easily differ in the color of the mantle. The discoveries of Dr. J. A. Allen on the relations between locality and coloration in American animals, from North to South, will at once come to mind, as his remarks have been freely quoted by most naturalists. He

found "a decrease of intensity of colour with a decrease of humidity, the paleness evidently resulting from exposure and the blanching effect of intense sunlight, and a dry, often intensely heated atmosphere." The same phenomena were observed in birds, on passing from East to West, "the darker representatives of any species occurring where the annual rainfall is greatest, and palest where it is least." Thus, strong sunlight has a bleaching effect, while a humid atmosphere causes intensity of pigmentation.¹

With regard to the melanistic form of this hawk, Dr. A. K. Fisher states (op. cit.): "From the above (grayish brown) there are all phases of plumage to a uniform sooty brown"; and, in the buzzard host observed by me in April, 1890, on the Powder River (Auk, Vol. XXIV, p. 262) numbers of melanistic individuals were present. In one day I beheld more of the latter than I have seen in the last twenty-two years of the Western Red-tail (*Buteo borealis calurus*) which is reputed to have a strong tendency to melanism; but I have not met with flocks of the Red-tail like those of Swainson's Hawk.² To sum up I consider that normal male members of Swainson's Hawk have two dark and two light plumages before becoming adult. According to my observations the bird does not breed until the fourth year, or until after it has assumed the first light plumage.

FEMALE PLUMAGE.

As previously narrated, the female of my pair of Swainson's Hawks escaped, and could not be captured, even with the aid of a pony. I am thus unable to prove the following conclusions from a captive specimen. In my opinion, the female has at least four distinct plumages parallel with the male (two dark and two lighter) and, like him, does not become fully adult until nearly five years old. The two first plumages are indistinguishable from those of

¹ Compare 'A History of Birds' by W. P. Pycraft, p. 83, 1910.

² Melanotic examples of the Red-tailed Hawk may be seen here in the striking plumage of chocolate-colored body and chestnut tail barred with black. In two specimens before me the tail of one of these hawks has eight and of the other twelve bars. I have never myself seen a black Swainson's Hawk with a noticeably light-colored tail.

the male, and the second plumage corresponds to the description of a young female, No. 33,508 in *North American Birds*, Vol. III, p. 267, as before mentioned. Always darker than the adult male, the two light normal female plumages coincide with his in the pattern changes of the underparts, which, although differing in color, show the same gradual diminution of the brown or chestnut pectoral area and the whitening of the ventral surface. I agree with Coues when he states that in the female "changes of plumage with age affect chiefly the underparts; the back, wings, and tail are more nearly alike at all times."¹

THIRD FEMALE PLUMAGE.

In this plumage the female Swainson's Hawk assumes the white throat, and, according to my observations, first begins to breed — that is in her fourth year. She has now the appearance of a plain brown and white bird. Her upper parts are precisely similar to the third male plumage (light umber brown) except that the chestnut edging to the feathers of the mantle is absent in the female. There are some bright chestnut lateral feathers concealed by the wings, and a trace of this color on the thighs and abdomen. The white ground of the latter is thickly variegated with wavy cross-bars of the color of the back, and some lateral feathers near the thighs are entirely brown. The large pectoral patch conforms in extent to that of the third male plumage, but in color exactly matches the back. The new primaries and tail feathers are slate colored but fade to dark brown before the next moult while the underside of the former is pale slate, blackening at the tips.

FOURTH FEMALE PLUMAGE.

In this the upper parts are unchanged. The hawk whitens considerably beneath, the pectoral patch is smaller, as in the equal-aged male, and becomes mahogany color in place of brown. The abdomen is thickly marked with triangular spots and cross-

¹ Key to *North American Birds*, p. 547, Ed. 1887.

bars of the former hue or even chestnut in some examples. The tibioe are pale chestnut. Adult females are met with nearly as light-colored beneath as some third plumage males, and for a long time I was greatly perplexed by them — being reluctant to shoot specimens on account of their exceeding tameness.

The passage in Coues describing the adult female (op. cit., p. 547): "throat pure white but other underparts probably never whitening decidedly" led me to suppose that these might be males despite the fact that they were incubating. Having at length watched the mother of my tame hawks (which was of this light type) lay an egg, all my doubts were removed.

A SUCCESSFUL PAIR OF ROBINS.¹

BY WINSOR M. TYLER, M. D.

THE following notes, taken for the most part while I had the birds under my eye, tell the story, as I saw it, of a pair of Robins (*Planesticus migratorius migratorius*) who successfully reared two broods of young from the same nest between April 26, 1912, when the nest was begun, and July 8, 1912, when the second brood was fledged.

I am sorry that I was able to watch the birds very little during the rearing of their first brood. After the completion of the nest, my notes give merely the dates of incubation, hatching and fledging. They make no reference to the feeding of the young and none to the disposal of excrement. I regret especially the latter omission, for, if we knew how generally the excrement was eaten early in the season, we might, by comparing the later behavior in this respect, get a hint of the extent that the excrement is used to satisfy hunger. In early July, when the female parent was feeding her second brood, her feathers showed much wear and she appeared emaciated. At this time, she almost invariably ate all the excrement that the

¹ Read before the Nuttall Ornithological Club, Feb. 17, 1913.

young birds voided, during the time I had her under observation. My regret is that my notes do not show whether this habit was equally constant in May, when her general condition was good.

May 1st. At 5:30 A. M. yesterday and again at the same hour this morning, a rather bright colored Robin, but a female I have no doubt, worked for half an hour or more on a nest in the crotch of a locust tree opposite my side window, in Lexington, Mass. The nest is fifteen feet from the ground. Its base was originally white and was made of white strings. This morning she added straw and more strings. When she comes in with her bill loaded with the material, she adds it to the center of the nest, stands upon it and scratches with her feet. Then she settles and pressing down with her breast, turns around this way and that. The effect is to drive downward the newly added material into the fast forming cup of the nest and to loosen some of the strings on the edge. These loose ends she seizes in her bill and imbeds firmly in the sides of the nest, thereby building up the rim of the cup.

May 6th. The nest is nearly completed. Today a steady drizzling rain is falling from the southeast. The robin worked during luncheon time. Her method seems the same; — each time she arrives at the nest, she seats herself in it, scratches, and then presses the material downward. I believe that no mud was used in the construction of the nest.

Incubation began about May 12th.

The young birds hatched about May 26th.

June 7th. The young robins all leave the nest in the early morning. In the afternoon, there is pandemonium in the yard next door. A little girl is unwittingly playing near one of the young birds and the parents are distracted. As alarm notes, they use the sharp, high "Pleent" and the lower toned, nasal "hünt" They are not at rest for a second; they fly down over the child's head, nervously restive; they pump their tails, flit their wings, fly back and forth, always crying. A Chebec, a Purple Finch and a Warbling Vireo sing on, undisturbed.

June 8th. In spite of the excitement of yesterday, the female bird repairs the nest.

June 13th. Incubation begins.

June 23rd. The female bird, although she sits on the nest most

of the time, appears restless. She often picks something from the bottom of the nest or from its edge and eats it. It may be that the young are hatched, but I see no feeding.

June 25th. The young are hatched now. This morning their mouths appeared above the rim. Both parents feed; twice seen together at the nest. The female covers young after feeding and often prods about in the bottom of the nest in what appears to be a careless and dangerous way.

June 28th. Both parents again feed their young, meeting as before at the nest.

June 29th. Four young are fed often by female parent who each time, picks from the nest and swallows whole, big white sacs of excrement. Generally she finds two pieces. The food consists of earthworms and something green which may be the green worm, the favorite of the *Vermivoræ*. The female covers young for the night at 7:30,— a dark cloudy evening. I suspect that sometimes the male bird collects food and passes it to his mate who carries it to the nest for the young.

July 1st. The young birds this morning fill the nest level full. They are restless; they toss themselves about in the nest and make attempts, apparently, to preen their feathers. The female covers the young, as best she can, at 7:35 P. M.

July 2nd, 7:10 P. M. The female parent finds a worm on the lawn, and shakes it many times before flying directly to the nest and feeding the young. Now when the parent comes to the nest there is just the faintest sound from the young birds; a little ticking sound, audible only when I am very near.

The female feeds young, then stands still looking down into the nest with head slightly on one side. One nestling rises and passes a faecal sac directly into the bill of the parent, who stoops to receive it. At the next visit, this is repeated, but as two young void at the same time, the parent receives only one sac directly; the other she snaps up from the nest.

From the deliberate way in which a young bird tilts and then discharges the sac, it seems evident that he understands what his parent expects of him, when she stands at "attention" after feeding. From my room, thirty feet away, I can tell at once when the parent arrives at the nest by the "ticking" of the young birds.

July 4th. The young are feathering out fast. They rear up and flap their wings, in danger sometimes, it seems, of falling. Between the parent's visits, the young sink down into the nest. Their heads and necks, hanging limply over the edge, look like dead snakes. 7:20 P. M. The female arrives with beak empty. The young rear straight up, swaying drunkenly — she stands motionless — they sink down, then one, and later a second, young bird raises his rear and passes a faecal sac directly into the parent's beak. She, as always before, swallows both sacs. The young settle down at once. It is growing dark. The act of raising his hinder extremity to void faeces is apparently as conscious an action as rearing for food and it is likely that both are associated with the presence of the parent bird. 7:44. The female returns. The young rear, but, as she stands motionless, they subside. She snatches up a bit of excrement (I judge from her actions; it is too dark to see) and then settles on the rim of the nest, partly covering her young, probably for the night.

July 5th. Both parents feed the young in the morning. 7:15 P. M. The female parent visits the nest, perhaps feeds — the young strain up toward her making a sound like "si-si-si-si" etc. The old bird stares at them — one turns up, and quivers his quarter-inch tail — the parent snatches the sac. 7:30. The parent returns; she feeds her young little, if any; she eats three faecal packages. The young birds now flap their wings when they rear.

July 7th, 8:30 A. M. The young birds act very differently this morning. They are so large that when they move about they overflow the nest. One of the brood often stands on a branch of the crotch and moves back and forth between it and the nest, using his wings (flapping) as well as his legs. The parents stand off and "cluck" or "tut" to the young who answer with a very similar note — like the "quack" of a Catbird. When the venturesome young bird stands on the branch and the sac falls toward the ground, the parent dives for it. Both parents come about the nest, but stand off and call before feeding. When they bring food to the nest, the young give their former "sizzling" note. I notice for the first time the female parent leave the nest with a sac in her beak. 11:45. The young stand straight up on the nest edge when the parent comes near. In the interval between her visits, one squats

on the branch wholly out of the nest. The rest slump back into the cup and continually preen their feathers, scratch themselves, stretch their wings or restlessly plunge about. They now utter a loud exclamatory "kwut." The parent arrives. All four young stand up facing her, flapping their wings and "sizzling." She goes away and returns at once from the cherry tree with a whole fruit. She crams this down first one throat and then another, sometimes letting go of it for a second, sometimes retaining her hold. She pulls it out again and again. Finally a young bird swallows the cherry.

July 8th. Three of the young birds left the nest in the early morning. Great excitement in the family! The fourth remained in the nest all day. He was fed regularly, I think, and the nest was cleaned as usual. He may have flown in the evening, but the next morning the nest was empty.

The history of this pair of Robins illustrates the division of labor practised by this species in rearing their young (the male assuming the full charge of the first brood when they left the nest), and the nice economy of time by which without the loss of a single day, preparations for the second brood followed the fledging of the first (four fertilized eggs being laid within six days after the young had flown).

When I read these notes at a meeting of the Nuttall Club, Mr. Brewster said that while it was well known that adult Robins ate the excrement of their young, he believed that the behavior of this female bird was exceptional in that she fed upon the fæces to an unusual extent.

I should like to add a word on this subject; my notes might otherwise give the false impression that this Robin ate the fæcal sacs solely in the evening. It was mere chance that I wrote my notes chiefly at this time of day: at other hours, her behavior was the same.

THE STATUS OF LLOYD'S BUSH-TIT AS A BIRD OF
ARIZONA.

BY H. S. SWARTH.

THE Santa Rita Bush-tit (*Psaltriparus santarita*) was described by Ridgway (Proc. U. S. Nat. Mus., X, 1888, p. 697) and remained for some years in good standing in the American Ornithologists' Union Check-List, as a species occurring in, and limited to, the Santa Rita Mountains, Arizona. The principal characteristic of the supposed species, as distinguished from *P. plumbeus*, was the presence of a dusky line on the sides of the head, over the auriculars.

During several seasons collecting in southern Arizona the writer collected a fairly extensive series of bush-tits, keeping a careful lookout for *P. santarita*, which, however, for some time he failed to find. Finally, in the summer of 1903, specimens were taken in the Santa Rita Mountains which answered the description, but they proved to be birds in juvenal plumage. In one or two instances adults, obviously in attendance upon these young birds, were collected, and these proved to be *plumbeus*; in other cases flocks from which examples of "*santarita*" were secured, were carefully scrutinized without revealing the presence of any individuals with black head markings. Altogether the writer felt convinced that the supposed Santa Rita Bush-tit was in reality the immature plumage of *P. plumbeus*, and so stated in a paper on the birds of the Santa Rita Mountains (Condor, 7, 1905, p. 81).

In the meantime Mr. Oberholser had published a synopsis of the genus *Psaltriparus* (Auk, XX, 1903, pp. 198-201), in which he made the following statement (p. 200) in regard to the disputed species. "The type of Mr. Ridgway's *Psaltriparus santarita* is an immature male of *lloydi*, as a careful examination shows, and it can be easily matched by young male specimens from any part of the range of the latter."

In accordance with this idea the third (1912) edition of the A. O. U. Check-List (p. 353) gives the range of *Psaltriparus melanotis lloydi* as including southeastern Arizona, presumably upon Oberholser's statement quoted above.

So the matter rested until recently. In the course of the preparation of a distributional list of the birds of Arizona it became desirable that the status in Arizona of these two species of bush-tits, *plumbeus* and *lloydi*, be definitely settled, and all material available was carefully scrutinized. In the course of this study additional specimens were discovered which appeared to prove conclusively the correctness of my previous assertion, that *santaritæ* was a synonym of *plumbeus* and not of *lloydi*.

The expedition which the University of California Museum of Vertebrate Zoölogy sent to the Pine Forest Mountains of northern Nevada in 1909, secured a large series of *Psaltriparus plumbeus*. Included therein are a number of birds in juvenal plumage, and a proportion of these have the head marking of "*P. santaritæ*." As there was no question of *P. m. lloydi* occurring in this region, this was a conclusive demonstration that the young of *plumbeus* frequently have more or less black on the head. The evident conclusion to be drawn from this was that "*Psaltriparus santaritæ*," occurring in a region where *plumbeus* is abundant, should be regarded as the young of that species and not of *lloydi*, unless adults of the latter species also were taken in the same place. As far as I knew there were no Arizona records of *lloydi* other than of the birds first described as "*santaritæ*," but the possibility that adult specimens of *lloydi* had been taken within the state, and that their capture was authority for the extension of range as given in the Check-List caused me to make inquiry in this particular.

Correspondence with Professor W. W. Cooke, of the Biological Survey, elicited the fact that no such adults had been taken, and that the inclusion of southeastern Arizona in the range of *lloydi* was based entirely on the belief that "*santaritæ*" was the young of that species. After examining the young birds which I sent him, Professor Cooke agreed with my conclusion that there was nothing to justify the further retention of *Psaltriparus m. lloydi* in the list of Arizona birds. He remarked further that there seemed to be no way of distinguishing with certainty between the young of *lloydi* and those examples of young *plumbeus* which possess the black head markings.

Following are brief descriptions of individuals of the Lead-colored Bush-tit (*Psaltriparus plumbeus*) in juvenal plumage. As

young and adult are practically alike in general body color these descriptions are restricted to the head with its distinctive markings.

No. 8616 (Mus. Vert. Zool.); juvenal, sex undetermined; Pine Forest Mountains, Nevada; June 14, 1909. Head with an extensive "mask" of black. Lores and space about eye (5 mm. below, 2 mm. above, 5 mm. behind) black, sharply defined against gray of rest of head.

No. 8614 (Mus. Vert. Zool.); juvenal male; Pine Forest Mountains, Nevada; June 14, 1909. Faintly defined black collar at back of neck, produced by black tips to the feathers.

No. 8625 (Mus. Vert. Zool.); juvenal male; Pine Forest Mountains, Nevada; June 27, 1909. A black line through the eye, widening posteriorly so as to form a triangle on side of head; continued over back of neck as a narrow black line.

No. 8611 (Mus. Vert. Zool.); juvenal, sex undetermined; Pine Forest Mountains, Nevada; June 2, 1909. A narrow line of dull black beginning behind auriculars and extending over back of neck.

No. 8618 (Mus. Vert. Zool.); juvenal male; Pine Forest Mountains, Nevada; June 11, 1909. Similar to No. 8611, but not so distinctly marked.

No. 4099 (Coll. H. S. S.); juvenal male; Santa Rita Mountains, Arizona; June 25, 1903. Black line extending backward from eye over side of neck.

No. 4098 (Coll. H. S. S.); juvenal male; Santa Rita Mountains, Arizona; June 25, 1903. A triangular shaped black mark extending backward from eye on side of head.

ANATOMICAL NOTES ON TODUS, OXYRUNCUS AND SPINDALIS.

BY HUBERT LYMAN CLARK.

DURING a recent visit to Cuba, Dr. Thomas Barbour was so kind as to secure alcoholic specimens of *Todus* and *Spindalis* for my study and I am glad to express here my thanks for his thoughtfulness. Mr. Ridgway has very kindly entrusted to me the remains of a specimen of *Oxyruncus* which he collected in Costa Rica and I have to thank him and Dr. Richmond for giving me the opportunity of examining this interesting bird.

TODUS.

The anatomical characteristics of this genus have been so fully worked out by Murie (1872, Proc. Zool. Soc. London, p. 664) and Forbes (1882, Proc. Zool. Soc. London, p. 442) that there would seem to be very little to add to their accounts. But the former confined his studies to the skeleton while the latter deals with the pterylosis so briefly that a few more details may well be mentioned. Forbes has called attention to the very short intestine in *Todus*; in the specimen before me from Cuba, it is about 70 mm. long or just about equal to the length of the bird without its tail feathers. The arrangement of the loops of the intestine is strikingly like that of *Alauda* as figured by Gadow (1879, Jena. Zeits., vol. 13, pl. XI, figs. 8 and 11) except that the loop 4-7 is not nearly as long. In this respect it resembles the arrangement in *Cypselus* (l. c., Pl. X, fig. 10), to which it is very similar.

Nitzsch's account (1840, Syst. der Pteryl. p. 127, pl. IV, figs. 9 and 10) of the pterylosis of *Todus* is unfortunately not very accurate. Forbes suggests that this was probably due to his observations being based on the study of skins. While this is no doubt true, it is also due in part to his inclusion of *Todirostrum cinereum* (L.) with *Todus viridis* L. in the genus *Todus*. It is hardly strange that the study of the skins of two birds belonging to

different orders, under the impression that they were congeneric, should lead to mistakes in describing the pterylosis of the genus! Forbes has pointed out that the sternal tracts are not remarkable, as they are figured by Nitzsch, but are quite like those of many Passerine birds, broad, undivided but abruptly contracted where they pass into the very narrow ventrals. The connection between the sternals and the humerals over the base of the wing is however unusually well feathered and this, no doubt, has led to one of the errors in Nitzsch's figure 9. Nitzsch says there are 19 remiges which Forbes corrects to 20, but the specimen at hand shows 21 very clearly, there being 11 secondaries in each wing. In the pterylosis of the head, there are certain peculiarities which neither Nitzsch nor Forbes mention but which are of some importance nevertheless. The back of the head is very sparsely feathered but about the middle of the neck the upper cervical tract begins abruptly and is densely feathered. The frontal tract is thickly feathered and is sharply limited on each side by a conspicuous supraocular apterium. The lower cervical tract continues clear to the gonys as a narrow, thickly-feathered strip bounded on each side by a prominent apterium along each ramus of the lower jaw. In all these three features, there is a noticeable resemblance to the pterylosis of *Alcedo*.

In the specimen before me, which is an adult *Todus multicolor* Gould, from Cojimar, Havana Province, Cuba, there is an interesting peculiarity, which calls for special comment. There are only eight rectrices and, while examination shows that one of the middle pair and one of the outside pair have been accidentally lost, it is clear that this bird never had but *ten*. Nitzsch gives the number of rectrices in *Todus* as twelve and all later writers have followed him. Through the kindness of Mr. Bangs, I have examined a number of skins of *Todus* from Cuba, Jamaica, Hayti and Porto Rico and in every case there are twelve rectrices. It seems then that this specimen which Dr. Barbour collected in Cuba is an individual variant, which in view of the peculiarities of the little family to which it belongs, is of more than ordinary interest.

OXYRUNCUS.

The only material of this rare bird available for study is the skinned carcass, minus head, limbs and intestines, of a specimen shot by Mr. Ridgway, April 7, 1905, at Bouilla, Costa Rica. The carcass has at some time been partially dried so that the muscles permitted of no careful dissection, and my observations are therefore confined to the tongue (which remains attached to the windpipe), the syrinx, the heart, the sternum, the backbone and the sacrum. In none of these parts, did I find a characteristic feature, but instead a striking resemblance to *Sayornis* and *Tyrannus* is evident in all. The tongue and syrinx are so much like those of *Sayornis* that the only difference noted is that the tongue is a little more horny than in the *Phoebe* and its posterior lobes have distinctly fewer and much smaller, sharp marginal papillæ. The heart is noticeably large, much larger than that of a Kingbird. It measures about 16 mm. in length by 9 mm. in thickness, while the Kingbird's is about 14 by 7½ mm. The sternum is almost exactly like that of *Sayornis*, only it is larger and the manubrium is longer, more deeply forked and hence more conspicuous. The scapulæ are a little longer, more pointed and more curved than in *Sayornis*, but the differences are very trifling. The coracoids are stout and the procoracoids are very conspicuous as in *Tyrannus*. The vertebral column is like that of *Tyrannus* in the number of its component parts but the first of the seven pairs of ribs are long and slender as in *Sayornis*. The sacrum is noticeably larger and its vertebral components more fully ossified than in *Tyrannus*, so that the sacra of the two genera can be easily distinguished, but none of the differences are important. Indeed, it must be said that so far as the internal structures which I have examined are concerned, there is no reason why *Oxyruncus* should be separated from the *Tyrannidæ*.

Mr. Bangs has kindly permitted me to examine the skins of an adult male *Oxyruncus cristatus* (Swains.) from Brazil and of three females of *O. c. frater* (Scl. & Sal.) from Costa Rica. The male shows the peculiar modification of the outer web of the first (tenth) primary perfectly developed, while it is entirely lacking in the three

females. Mr. Ridgway (1907, Bull. U. S. Nat. Mus., No. 50, p. 332) considers the character as really not worth consideration, the serration being so faint as to be practically non-existent." Again on p. 333 (footnote) he says the character is "very indistinct in all specimens examined" and yet on p. 334 (footnote) he says that it is "very obvious in a specimen sexed by the collector as a female." It seems to me that Mr. Ridgway has been misled by the mistake of this collector who apparently sexed a male as female. Such mistakes are not rare, most collectors having probably made them at some time, and it is easier for me to believe that such a mistake has occurred in this case, than to question the importance of this striking character. It is well known that in several genera of Pipridæ, the male possesses peculiar modifications of the wing feathers as a secondary sexual character and it is probable that in *Oxyruncus* the serration of the tenth primary on its outer web is of a similar nature. More material would seem to be necessary before the question can be definitely settled.

SPINDALIS.

Dr. Barbour collected at Guantanamo, Cuba, a fine pair, male and female, of *Spindalis pretrei* (Lesson) which I have examined with much interest. The general pterylosis is notable only in that the dorsal tract does not have the rhomboidal form usual among Passeres but is narrowly elliptical as Nitzsch figures it in *Oriolus*. The other tracts show no special peculiarities. The wing is somewhat rounded, the sixth, seventh and eighth primaries being rather short and subequal, with the ninth and fifth still shorter. There are of course nine primaries and nine secondaries. The twelve rectrices are approximately equal, though the outer ones are really the longest. The bony palate is notable chiefly for the very long and slender palatine processes. There is no trace of a secondary palatine process such as occurs in *Zamelodia*. The alimentary canal is characterized by a rather short and unusually large intestine. The stomach is small, less than 10 mm. long, and there is no crop, though the basal part of the œsophagus is somewhat enlarged. The intestine is only about 90 mm. long, but is about

3 mm. in diameter and there is little difference in size between the small intestine and the rectum. The intestinal loops are naturally few and simply arranged as in many Passerine birds; there is nothing distinctive in their arrangement.

Examination of the sternum revealed the interesting fact that it is like that of any finch, the only peculiarity being in the manubrium which is very large with the two arms or divisions long and widely spreading. There is no trace of an "osseous bridge" from the anterior margin of the sternum to the manubrium such as occurs in *Piranga*, nor is there any bony roof, either with or without foramina, covering a space back of the anterior margin, such as occurs in *Saltator*, *Pipilo* et al. There are no differences to be seen between the sternum of the male in *Spindalis* and that of the female. The absence of the "osseous bridge" in this genus indicates either that its presence is not characteristic of all tanagers or else that *Spindalis* is not a tanager.



THE NEST LIFE OF THE SPARROW HAWK.

BY ALTHEA R. SHERMAN.

THE nesting of a species new to our place always is an event of great interest, and doubly so when the birds are of the hole-nesting sort, whose home life at very close range has never been exhibited (so far as is known) to mortal eye; but when the species is one of the Raptores interest heightens and feelings become indescribably mixed; there is the anxiety to watch the nest life mingled with fear for our harmless, little feathered friends, that trustingly have returned to their summer home; hence on April 4, 1912, it was with a perturbed mind that a pair of Sparrow Hawks (*Falco sparverius sparverius*) that had arrived the day before, were watched while they inspected the nest box occupied by Screech Owls two years previously.

Never before in our immediate neighborhood—National, Iowa—

had Sparrow Hawks nested, yet for years man and nature had been at work preparing the way for them. Four years prior to this lightning had smitten the tallest and fairest willow of a group of these trees, and its dead branches invited the Hawks to rest; there the home-seeking pair found facing them, eighty feet away, a hole in my bird blind that gave entrance to a nesting box whose bottom surface, eight by twelve inches in dimensions, was deeply covered with sawdust and excelsior. This place seemed to satisfy them for several days until they ventured to the barn, where they found eight other boxes similarly furnished for nesting and roosting places for Flickers. During the next two weeks they visited the various boxes and scratched in the excelsior, their choice of a nesting place seemingly pointing toward the barn, but in this they were not encouraged. Toward the end of April they again frequented the dead willow and the box in the blind became their final choice.

There the first egg was deposited on April 28 before eleven o'clock in the morning, and an egg was laid on each alternate day until the sixth, and last, on May 8. That the hour for laying was later than that of many common species appears from the fact that on April 30 the second egg had not been laid at half past nine in the morning, but was in the nest by four o'clock in the afternoon, when the nest was again visited and the female found at home. Each egg was weighed upon the day it was laid, and their weights in the order of laying were 212, 227, 220, 225, 228 and 204 grains respectively. Four of these salmon-colored eggs were very similar in appearance, bearing large blotches of a chocolate brown, the sixth egg was finely speckled instead of blotched, while the fifth was strikingly different from the others having large unmarked spaces of the ground color through the center, and some blotches on the ends. The bird that came from it was as marked in its disposition as the egg-shell was in its coloring.

Incubation was performed mainly by the female, only once was the male found in the nest, which he did not leave until the blind had been noisily entered, since by the female sitting on her favorite perch we had been led to think that the nest was unoccupied. On the other hand the female was accustomed to fly from the nest the instant the key touched the lock of the door, if she had not already flown upon hearing human footsteps or voices. Sometimes it was

noted that the eggs were left uncovered nearly or quite an hour, while both birds sat in their tree preening themselves, an exercise in which they spent a vast amount of time.

The first egg proved infertile, the third one, taken to reduce the number of hawks, also as a souvenir, contained a living embryo. Of the remaining eggs the second and fourth hatched on June 4, the bird from the former egg was still wet at 7.45 o'clock in the morning, and weighed 154 grains. The following morning at a quarter of eleven o'clock the hawklet from the fifth egg was found not thoroughly dry, weighing 166 grains, and showing that it had been fed. The bird from the sixth egg still wet, and weighing 139 grains, was found at half past eight o'clock on the morning of June 6. These data plainly show that the period of incubation must have been thirty days for the fifth egg, and twenty-nine days for the sixth egg.

Very soon after hatching the young would bite vigorously at a finger that touched their bills, opening their eyes for an instant as they did so, but not until they were two or three days old did they keep their eyes open longer than a few seconds at a time. From their first day they uttered a faint cry, when expecting food, that suggested the scream of the mature Sparrow Hawk, also peeps similar to a chicken but more mournful. This peeping was continuous while they were out of the nest. There was a third cry, difficult to describe, which they uttered when fed.

On June 13 the first manifestations of fear were detected, when the hawklets flattened themselves on the bottom of the nest, but such signs were rare for a few days thereafter. It was on the following day that for the first time they were seen ranged against the sides of the nest their backs to the wall; this arrangement appeared to be the normal one, thus the center of the nest was given to the one that was eating, or to the mother, when she came to feed them. When two weeks old they could run quite well; when placed on the floor of the blind they ran to the inner angles formed by the studdings and the walls, where with backs well braced they faced the foe, and a few days later met with savage claws an approaching hand.

At a very early age their alert bearing together with their bright eyes and snow-white plumage made a picture long to be remembered.

By June 10, the down, or more correctly the neossoptiles, began to look dirty and the next day pinfeathers showed in this covering. By the 13th, the pinfeathers had pushed these neossoptiles away from the body to such an extent that the nestling looked half clothed. At sixteen days of age the barbs of their remiges showed sufficiently for one to be positive concerning the sex of the hawklets, and it was learned that eggs Nos. 2 and 6 had contained males, and Nos. 4 and 5 females. It was the shell of the fifth egg that bore unusual markings. Could oologists (or the clutchers of eggs) have studied the life of the bird that came from this egg, it is believed that all would have been convinced that "what is in the egg" is of greater importance than the lifeless shell. Numerous visitors came to see the young Sparrow Hawks and a nestful of Flickers that were being reared in the barn. Two of these friends from a distance named the young hawks, bestowing on the older male the name of Jeremiah, and his younger brother, because of his extreme meekness, was called Moses; the females were named Ruth and Jezebel. The last mentioned was an extremely wicked little wretch. When but sixteen days old she began to fight. Upon the opening of the nest door that day the rest of the brood stood back against the side of the nest and opened their mouths, a feeding response probably, but with a threatening mien Jezebel stretched herself to her utmost height, some seven or eight inches, then struck at my hand repeatedly with her claws. From that day onward a marked difference was observed in behavior of the males and of the females. When a finger or a stick was pointed into the nest all opened their mouths; the males did little more than this as they hugged the farthest side of the nest, but the females, springing to the center of the nest, every feather on their heads standing out seemingly at right angles, wings spread, mouths open and squawking, were ready to claw and bite, Jezebel being the fiercer of the pair. When taken from the nest the rapidity with which she would whirl round, when a finger was circled above her, was remarkable especially at the early age of eighteen days. Sometimes clawing was done by Jerry, but Moses usually was as gentle as a dove. The record of their daily weights shows, that after the mother ceased to feed them, the females appropriated more than their share of food, in fact on June 22 it was noted that Moses,

one day younger than Jezebel, was five days behind her in weight, and three days in development of plumage. No strife over their food was ever witnessed. This yielding of their lawful share of food by the males may have had its origin in their disposition in mature life to give the food they bring to their mates. Ruth was found eating more frequently than the others.

Viewing of the nest when the mother bird was at home was eagerly sought. The blind in which the nest was located is a rude structure, forty-five inches square, built for shelter while watching Rails and migrating birds. In preparation for observing the nest while Mother Sparrow Hawk was at home the windows were completely darkened. Some cracks in the walls let in a little light, also a little fresh air, which in the latter days of the nest proved an appreciated blessing. Protection from the faint rays of light that penetrated through the cracks was afforded by the depths of a sun-bonnet. The keenness of vision of a hawk is proverbial, that these precautions were sufficient was proved when for a half hour undetected, I, sixteen inches away, looked through a peep-hole into the mother hawk's eye, and watched her as she brooded. This was not achieved upon the first attempt, when two hours were spent in fruitless waiting for her coming. After that, except near the close of the nest period when both parents were absent hunting, all attempts to watch the nest during the mother's visits were made after visitors to the blind had left me there alone. At first standing noiselessly upon a box with head scraping the roof of the blind for one hour, or for two hours, was not an easy task, later it became almost insupportable with the heat of an afternoon sun beating upon the blind, and with the stench from a nest, whose walls were thickly incrustated with excrements. But consummation was near at hand when hawk screams were heard from without, that called forth anticipatory peeps from the young after they were old enough to note the screams. When the mother came in there was little clamor and no struggling for food on the part of the nestlings. In their earlier days they merely braced themselves in the circle where they lay, later they stood in an orderly row against the side of the nest. With great rapidity the mother tore the flesh and bending her head almost at right angle with the bill of the young one she gave it the morsel. Her motions in this act were

very dainty and graceful; this bending of her head was apparently necessitated by the hooked beaks of both. Sometimes the pieces served were so large that they were swallowed with difficulty. No more than five minutes were occupied in these feedings. At first the food served was "dressed meat," and the remainders of the feast were carried out by the mother, and eaten by her in the dead willow. On June 17, she brought in the body of a half-grown ground squirrel with the skin still on, probably I frightened her out prematurely, since she left the remnant of the squirrel. It was not until a week later that she began regularly to leave the quarry for the hawklets to feed themselves. Thereafter she entered the nest with the food, but remained inside less than a minute, sometimes no more than twenty seconds.

Experiments were made with the nestlings to see if they would eat living animals. When quite young a blow-fly was given, and some days later newly hatched English Sparrows were put into their mouths, but all were rejected. On June 30, thirty-three English Sparrow nestlings and eggs were given them, among them were two live fledglings nearly ready to leave the nest. The eggs and the dead Sparrows were eaten, but the live Sparrows remained all day in the hawk nest uninjured. It appeared to be a case not of the "lion and the lamb" but of the Sparrow and the Sparrow Hawk lying down together. This escape from the eye of the mother bird must have been due to her very brief visits.

In the spring while the question: 'Shall or shall not the Sparrow Hawks be allowed to remain and increase their kind?' was pending, all available ornithological literature was searched to learn if possible the degree of danger from these Falcons, that was threatening our birds. Besides one writer's statement that to a family of Sparrow Hawks twelve small birds were brought in one day, there was the reliable data furnished by the examination of stomachs of this species. The figures given by Dr. Fisher show that eighteen per cent of the stomachs contained the remains of birds. This is the same percentage that was found for Screech Owls. In previous years we had harbored these predaceous little villains, and some small birds had survived, therefore it was decided to give the Sparrow Hawks a trial at the same time to watch closely their relations with other birds. The first birds disturbed by them

were the Phœbes; when the Hawks frequented the barn the Phœbes disappeared, but when the Hawks were frightened away Phœbe resumed her task of refitting the very old nest that had cradled so many generations of her species; and later two broods were raised there in safety. The Flickers were driven away from the barn, but returned there to nest after the Sparrow Hawks chose the blind for their nest site. The Flickers more expeditious than the Hawks in incubation hatched out their brood on June 6 — the first egg having been laid on May 21 —, this hatching chanced to be on the birthday of Moses, and a comparison of development of Flickers and Sparrow Hawks made an interesting study. The Flickers gained in weight a trifle faster, but were homely, whining, helpless little creatures after the Hawks were well feathered and active. Both species left their nest on the same dates.

After the female Hawk began incubation English Sparrows built a nest in another box in the blind not four feet distant, and there raised their brood. Next to these the species that nested nearest was the Red-headed Woodpecker. A pair of these birds began their nest on May 29, in the dead willow about half way to the top. They brought out but one offspring. It is impossible to say that any of their young were taken by the Hawks. The only time a disturbance was witnessed was on June 28, directly after the Red-heads had changed places in the nest. The female Sparrow Hawk left her perch a few feet away, went to the Red-head's hole and looked in; the departing Redhead returned and drove her away. Exactly forty-six feet from the trunk of the dead willow, and fifty feet or thereabout from a favorite perch of the female Hawk a pair of Mourning Doves raised a brood. Their young were flying about in the willows on June 20. Probably it was this pair that built its second nest in a cedar tree a few rods distant, and its third nest on the site of the second, where a Dove was sitting until September 8, after which she deserted her eggs, containing well developed embryos. This is considered worthy of mention because all the other Mourning Doves of the neighborhood had left before that date. Another pair of Mourning Doves raised two broods in the house yard. From a plum tree nest conspicuously in sight of the Sparrow Hawks a pair of Brown Thrashers brought out four young, which fully grown were following their parents, and begging

for food when the latter were building their second nest. Another pair of Brown Thrashers built their nests in gooseberry bushes, their first nest being 105 feet from the hawk tree, the second 200 feet from it. In both cases the young left their nest, but it is impossible to say that all escaped afterward.

Enough cases have been cited to show that these Sparrow Hawks were not nest robbers like the Blue Jays, neither did they take any of the chickens, numbering fully one hundred and fifty, that were brought out in a yard twenty rods from their tree. As far as my observations extended their avian victims were fledglings not long out of the nest; also that the Hawks were crafty enough not to prey to any great extent upon the birds in the immediate vicinity of their nest among which they were in bad repute. They were frequently mobbed by Bronzed Grackles, that made vicious passes at them, especially if one were eating, whereupon it raised its wings and screamed, perhaps screamed for mercy. A dash of the Kingbirds sent the Hawks squawking from their tree. Once a pair of Baltimore Orioles followed one of them to the tree and for some time acted as if they had a score to settle. At another time Meadowlarks raised a tumult and followed the Hawks. It was feared that the victim that time was the little Meadowlark, that with a Cowbird nest-mate had been watched and weighed from the day of their hatching, and had but recently left the nest. The Cowbird, seen at intervals later, was known to have escaped.

When the hawklets required the largest supply of food the greater part of four days, beginning June 26, was given to uninterrupted study of the home life of the Hawks. Various places were chosen from which to watch, until an upper window in the house was found the best. It was three hundred feet from the nest, but nearly twice that distance was traveled to reach the blind every time food was delivered in the nest. These trips were for verifying the identifications of the quarry, and in case it was a bird to secure its tarsi. The top of the willow was about level with my window from which with the aid of 8-power binoculars the behavior of the Hawks was easily seen. The male did the greater part of the hunting, but there were a few times when the female brought food of her own catching. The average length of the intervals between the bringing of the quarry was two hours and twenty-five minutes, the

longest interval being three hours and forty-three minutes, and the shortest twenty-three minutes. This refers to food that was brought into the tree, not to the nest, for the female frequently ate the game brought in. For example on June 28, she ate three birds, and was absent five times, which altogether amounted in duration to two hours and twenty minutes, when she may have eaten several other birds. The notes for that day show that the prey was: in the forenoon at 8.15 o'clock, a bird, which was eaten by the mother Hawk, as likewise was the bird brought at 10.07; at 11.30, a bird, taken to the nest, and in the afternoon at 3.01 o'clock, a meadow mouse, taken to the nest; at 4.00, a bird, eaten by the mother; at 6.55, a meadow mouse, which was taken to the nest as was the sparrow brought in at 7.17 o'clock. It is most likely that the father Hawk brought a piece of game early in the morning, and another piece about one o'clock in the afternoon, when for an hour observations were suspended. At noon that day the aggregate weight of the four hawklets was 7648 grains, and it was 8166 grains at half past seven in the evening, a difference of 518 grains, the known supply of food having been two meadow mice and one small sparrow. In the forenoon of June 25 there was brought to the young three half-grown ground squirrels and a bird.

At different times the character of the game varied; for a time nothing but ground squirrels was seen, followed by two days and a half when, excepting one squirrel, birds only were brought in, and this was succeeded by a similar period when only meadow mice were seen. It would appear from this that the male Hawk found a brood of young birds or mammals and hunted in their neighborhood until he had exterminated the whole brood. Confirmatory of this was a succession of four birds about equal in size, whose bodies resembled in shape those of young Brown Thrashers or Robins just out of the nest. After June 14 the identified quarry consisted of seventeen birds and nineteen mammals; of the latter eight were meadow mice and the rest ground squirrels. Besides these there were nine unidentified pieces, several of them apparently insects, that were fed the young after they left the nest. The tarsi of the eight bird victims found in the nest were sent to Washington, D. C., where Mr. E. R. Kalmbach and Mr. H. C. Oberholser very kindly identified them for me. Six of the eight were pronounced to belong to sparrows.

According to the economy of these Hawks incubation, the brooding and the feeding of the young, and the guarding of the nest was the part of the female, while the male hunted for the family; only once was he seen in or near the nest. A few times he circled overhead and joined in the screaming, when I was near the nest, his notes sounding thinner and in a higher key than those of his mate. At such times the female made a great commotion with her screaming and flying at me, notwithstanding all her noise and bluster she was an arrant coward, never coming nearer than four or five feet of my head. With a hundredth part of the provocation a Red-winged Blackbird or a Brown Thrasher would have hit, perhaps hurt a trespasser on its domain. After a time the female recognized me and began to scream, while I was still distant and nearly hidden by trees. The neighbors said that they knew when I appeared out of doors from the screaming of the Hawk. Other people, men, women, and children daily frequented the enclosure in which stands the bird blind, but her screams were reserved for me alone. To guard the nest she sat in the dead willow. In April both of the pair sat in the top of the tree, during incubation and the earlier days of the young the branches extending from the middle of the tree were used, and during the last ten days of the nest the top branches were again occupied.

Hunting was done for the most part to the southwest, the land there being devoted to farming, while the buildings of our decadent hamlet are situated in the other directions. Immediately to the southwest of the hawk tree lay an eighty acre cornfield abounding in ground squirrels. Not a tree nor a bush intervenes between this tree and the nearest farm yard a half mile away. Sitting on her lofty perch the female often spied her mate while he was still afar off, and with much screaming flew to meet him, and secure the prey he bore in his talons. Sometimes the meeting was no more than two or three hundred feet from the tree, but it was impossible to see her manner of seizing the quarry. Sometimes the male, still holding the prey, dashed by her to the tree, where still screaming she secured it. Once a ground squirrel retaining its head was brought in, all others were beheaded ones. The birds, headless, tailless, and wingless, were well plucked, yet the mother bird appeared to find some work to do on them before she delivered them

to the nest with scarcely the smallest feather remaining on them. Sometimes she skinned the ground squirrels, the nestlings ate the skins when she omitted the operation. The meadow mice were not skinned, but she always spent several minutes plucking out the hair, nevertheless much remained when taken to the nest. After she had snatched the prey from her mate, she usually uttered whine-like screams for two or three minutes before beginning her work on it. Crotches or peeling bark on the tree afforded her three or four places suitable for her flaying. In moving from place to place she sometimes carried the prey in her talons, but generally in her beak, and always thus when she flew from tree to nest. This flight she never made directly from her skinning places, but always descended to the lower branches of the willow by a series of short flights before starting for the nest; this she never did so long as she saw herself watched.

More vociferous screams than usual greeted my first appearance on the morning of June 28, awakening suspicions which were confirmed by a visit to the nest, and finding there that Moses had his head out of the entrance hole. After that hour one fledgling or another sat in the hole most of the time, shutting out the light and the fresh air. The weather was very hot, and the nest exceedingly filthy, yet that it was still "home, sweet home," to the hawklets was attested by the alacrity with which they hopped into it when held before the door. Jeremiah, the first born, marked by a red string on his foot, left the nest in the forenoon of June 30, some time between a quarter past eight o'clock and noon; and Ruth followed early the next morning. Frantic screams of the mother attended my search for Ruth. Very unlike the crouching, bustling, menacing creature of the previous evening was the very erect and slim little bird found perching in a willow sapling about fifty feet from the nest; and it was a gentle, farewell nibble that she gave the extended finger. Moses left the nest early in the morning of July 2, and Jezebel between five o'clock and half past that hour of the succeeding morning.

For a week the Hawks, old and young, staid about their tree. On the morning of July 11, the other birds sang a halleluiah chorus in the dead willow, that had been held by the Hawks for ninety-nine days; and no one could help wishing that the last had been

WEIGHT OF SPARROW HAWKS IN GRAINS.

Egg.	No. 2.	No. 4.	No. 5.	No. 6.	Daily average weight.
Weight. When fresh. On June 4.	227 —	225 186	228 192	204 174	
	Jeremiah.	Ruth.	Jezebel	Moses	
1 ¹	154	157			
2	189	168	166		
3	253	229	191	139	203
4	363	325	248	180	279
5	465	421	365	233	371
6	632	559	520	330	510
7	786	695	621	424	631
8	898	804	755	559	754
9	1073	1002	918	711	926
10	1217	1150	1093	840	1075
11	1276	1230	1169	942	1154
12	1471	1339	1310	1076	1299
13	1586	1517	1391	1205	1424
14	1686	1641	1627	1307	1565
15	1720	1709	1704	1438	1642
16	1735	1770	1757	1495	1671
17	1757	1808	1795	1616	1744
18	1804	1856	1938	1512	1777
19	1771	1898	1818	1600	1771
20	1831	2000	2038	1811	1920
21	1848	1940	2006	1598	1848
22	1815	2050	2056	1740	1915
23	1809	1992	1988	1685	1868
24	1800	2040	2072	1761	1918
25	1749	2073	2090	1736	1912
26	1784	2036	2055	1680	1888
27	Left nest	2060	2062	1684	
28		Left nest	2069	1678	
29			2176	Left nest	
30			Left nest		

¹ Days in the lives of the Sparrow Hawks.

seen of the Sparrow Hawks, but they were not so obliging. During the next two weeks occasionally one or two of them came to the old tree. Not infrequently until the last of September three of them together were seen elsewhere. In the case of some other species it has been noted that sometimes the brood was divided, the father bird taking part of them some distance from the place in which the mother cared for the others. It remains for future investigations to decide whether the father Sparrow Hawks takes the males under his guidance, and the mother Hawk the females; whether the advocates of the system of segregation of sexes in education can claim a praise-worthy precedent in the practices of the Sparrow Hawks.

In the two months they remained in the neighborhood after leaving our place the Hawks were seen most frequently about the nearest farm yard to the northwest, about the county fair grounds, and on the public school grounds. At the last named place on several occasions they were seen to perch on the brackets of the cornice of the schoolhouse. Twice the days were rainy, and the birds may have returned for shelter to their accustomed roosting places.

ADDITIONAL NOTES FROM THE MOUNTAINS OF WESTERN NORTH CAROLINA.

BY FRANCIS M. WESTON, JR.

DURING the first three weeks of September, 1912, while staying in the mountains of Transylvania County, N. C., I was able to devote some of my time to the study of the bird life of the section. The results of this study may be of interest when taken in connection with the excellent paper published by Messrs. S. C. Bruner and A. L. Feild (*Auk*, XXIX July, 1912, pp. 368-377).

The greater part of my field work was done in a restricted locality

in the lower part of the Davidson River valley about a mile and a half west of the railroad station of Pisgah Forest, and three miles north of Brevard. The valley at this point is at an elevation of about 2200 ft., and is enclosed between hills and low mountains. A few miles farther to the west, the mountains increase in size, attaining an elevation of 6000 ft. on the line between Transylvania and Haywood Counties. This ridge of high mountains is known locally as the "Balsams." The only peak of this ridge which I visited is Silver Mine Bald (6040 ft.), one of the twin peaks of Chestnut Bald.

In June, 1911, Messrs. Bruner and Feild walked for a month through the mountains of western North Carolina; and their concise, tabulated account was of great service to me. Their work was, of course, far more complete than mine, as other duties often prevented my being in the field more than a few hours a day. In consequence, they noted twenty-three species which I did not find; and described as common many species which, from the negative evidence of my notes alone, may be considered rare. However, my work was done in a month when most birds are silent as well as shy.

After the breeding season, it is probable that many species may wander several hundred feet above or below their breeding ranges; and it is not surprising that, in a few cases, I found birds some distance above or below the limits noted by Messrs. Bruner and Feild. This same reason may account for my having found thirteen species which they do not mention. These are: Pied-billed Grebe, Spotted Sandpiper, Sharp-shinned Hawk, Osprey, Pileated Woodpecker, Red-headed Woodpecker, Nighthawk, Red-winged Blackbird, Barn Swallow, Loggerhead Shrike, Worm-eating Warbler, Pine Warbler, and Redstart.

On former trips — viz., Hendersonville, Transylvania County, July 15 — Aug. 3, 1907; and Cashiers Valley, Jackson County, Aug. 4-19, 1907 — I noted four species which I did not find on the 1912 trip, and which are not mentioned by Messrs. Bruner and Feild. These are: Black Vulture, Great Horned Owl, Yellow-billed Cuckoo, and Blue-grey Gnatcatcher.

The following extract from my notes includes only those species for which my records differ from those of Messrs. Bruner and Feild, and the species which were not noted by them.

1. **Podilymbus podiceps.** PIED-BILLED GREBE.— Two Grebes were seen on Lake Toxaway (3000 ft.) on Sept. 9, and one above the mill dam on Davidson River (2200 ft.) on Sept. 13.

2. **Florida cærulea cærulea.** LITTLE BLUE HERON.— I was told on good authority that small white Herons were seen from time to time along the Davidson River. Although I did not see any, I feel confident that they must belong to this species.

3. **Butorides virescens virescens.** GREEN HERON.— A single Green Heron was seen on Davidson River (2200 ft.) on Sept. 13. In 1907, I saw two at Hendersonville (about 2100 ft.). Messrs. Bruner and Feild did not find this species above 2000 ft. in June, 1911.

4. **Actitis macularia.** SPOTTED SANDPIPER.— On Sept. 6, I saw two birds of this species feeding along the banks of Davidson River. This Sandpiper was found by Messrs. Bruner and Feild in the mountains of eastern Tennessee, but was not observed in North Carolina.

5. **Catharista urubu.** BLACK VULTURE.— In Hendersonville in 1907, I found quite a number of Vultures. They were generally seen singly, but sometimes in flocks of five or six.

6. **Accipiter velox.** SHARP-SHINNED HAWK.— Several of these Hawks were found in the Davidson River valley on and after Sept. 13. On Sept. 18, I saw two on the top of Silver Mine Bald (6000 ft.).

7. **Pandion haliaëtus carolinensis.** OSPREY; FISH HAWK.— On each of two days — Sept. 3 and 17 — I saw a Fish Hawk in the Davidson River valley (2200 ft.).

8. **Bubo virginianus virginianus.** GREAT HORNED OWL.— In 1907, I twice heard the call of this Owl at Hendersonville. Although I did not see any, I heard that one was taken a few days after I left there.

9. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.— In 1907, I saw one Cuckoo at Hendersonville and two in Cashiers Valley. Several were heard calling.

10. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— Fairly common in and near the cleared lands of the Davidson River valley. One was found on the side of Silver Mine Bald (5200 ft.), several hundred feet higher than Messrs. Bruner and Feild noted the species in June, 1911.

11. **Phlœotomus pileatus (abieticola?).** PILEATED WOODPECKER.— The few that were seen were near the cleared lands of the valleys. None were noted above 3300 ft.

12. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— On Sept. 9, one was seen in the fields of the French Broad River valley at an elevation of about 2100 ft.

13. **Chordeiles virginianus virginianus.** NIGHTHAWK.— On each of two days, a few were seen in the Davidson River valley. A few were seen near Hendersonville and two in Cashiers Valley in 1907.

14. **Cyanocitta cristata cristata.** BLUE JAY.— Abundant in the Davidson River valley. I found Jays common about our camp on the side of Silver Mine Bald (5200 ft.), and saw a few at the top of the mountain

(6000 ft.). In June, 1911, Messrs. Bruner and Feild did not observe this species above 5000 ft.

15. **Agelaius phoeniceus phoeniceus.** RED-WINGED BLACKBIRD.— This species was twice noted at Hendersonville in 1907, and once in the Davidson River valley in 1912.

16. **Astragalinus tristis tristis.** GOLDFINCH.— Abundant in the Davidson River valley. One was heard on the side of Silver Mine Bald (5200 ft.)—several hundred feet higher than Messrs. Bruner and Feild noted the species in June, 1911.

17. **Cardinalis cardinalis cardinalis.** CARDINAL.— Abundant in the Davidson River valley. On Sept. 18, I found Cardinals fairly common on the side of Silver Mine Bald (5200 ft.)—several hundred feet higher than Messrs. Bruner and Feild noted the species in June, 1911.

18. **Hirundo erythrogastra.** BARN SWALLOW.— On each of three days, I found Barn Swallows quite common about the railroad station of Pisgah Forest. None were seen after Sept. 11.

19. **Lanius ludovicianus ludovicianus.** LOGGERHEAD SHRIKE.— One Loggerhead was seen in Hendersonville in 1907, and a few near Pisgah Forest in 1912.

20. **Helmitheros vermivorus.** WORM-EATING WARBLER.— I found two of these Warblers in Cashiers Valley (3500 ft.) in 1907, and two in the Davidson River valley (2200 ft.) in 1912.

21. **Dendroica vigorsii.** PINE WARBLER.— One was seen in the trees bordering Davidson River (2200 ft.) on Sept. 10.

22. **Dendroica discolor.** PRAIRIE WARBLER.— I found this Warbler twice in the Davidson River valley: on Sept. 5 at 2200 ft., and on Sept. 16 at 2300 ft. Both of these records extend the range of this species as observed by Messrs. Bruner and Feild in June, 1911.

23. **Oporornis formosus.** KENTUCKY WARBLER.— On Sept. 12, I saw two of these handsome Warblers on the banks of the Davidson River (2200 ft.) In June, 1911, Messrs. Bruner and Feild did not find this species above 2000 ft.

24. **Setophaga ruticilla.** REDSTART.— In July and August, 1907, I saw one of these birds at Hendersonville and three in Cashiers Valley. In Sept., 1912, I found them fairly common everywhere in the Davidson River valley. On Sept. 18, a number were seen on the top of Silver Mine Bald (6000 ft.).

25. **Nannus hiemalis hiemalis.** WINTER WREN.— On Sept. 8, I saw a Wren of this species in deep woods at an elevation of 3200 ft. In June, 1911, Messrs. Bruner and Feild did not note it below 4000 ft.

26. **Polioptila cærulea cærulea.** BLUE-GRAY GNATCATCHER.— One Gnatcatcher was seen in Cashiers Valley in August, 1907.

27. **Hylocichla mustelina.** WOOD THRUSH.— On Sept. 18, I found a Wood Thrush in the deep woods on the side of Silver Mine Bald (5200 ft.). This is several hundred feet higher than Messrs. Bruner and Feild noted this species in June, 1911.

SOME NORTH AMERICAN BIRDS IN PANAMA.

BY L. L. JEWEL, C. E.

DURING the greater part of 1911 and up to September, 1912, the author lived at Gatún, Canal Zone, and nearly all Sundays and holidays during this period were spent in collecting and studying native birds. Naturally, many birds of the A. O. U. Check-List were observed, some resident in Panama and some transients or winter visitors. After July, 1911, records of the occurrence of such have been kept as completely as available time would allow. In many cases specimens were taken as recorded in the annotated list following.

Gatún is situated seven miles inland and directly south of Colón, at the beginning of what are practically the first foot hills of the Isthmus. The coast-line swings so far in just west of Colón, however, that only three or four miles of low flat land — some of it very marshy — separates Gatún from the bay. Indeed, salt water now comes up the old French canal, the East Diversion and the new American canal, to the very door of Gatún.

The valley of the Rio Chagres is here about a mile and a half wide and is now, of course, filled across by the Gatún locks, dam and spillway. This construction work has destroyed much cover, but on the other hand, the clearings made in and about the town of Gatún and the partial filling of Gatún lake have perhaps made the locality more attractive to certain migrant birds from the north.

To the south of Gatún the ridges diverge rapidly with miles of the Black Swamp country stretching between them and only a few thickly grown knolls less than one hundred feet high scattered here and there. Practically all of these will be submerged when the lake is altogether filled.

The higher hills on either side of the valley at Gatún, are about two hundred and fifty feet above sea level, with a few points reaching to twice that elevation.

Just three miles south of Gatún on the old line of the Panama Railroad, and in the heart of the Black Swamp country is, or rather was, Loma de Leon, or Lion Hill. It is now accessible only by

canoe and will soon be lost under the rising waters of Gatún lake. Thus passes perhaps, the foremost land-mark of Middle American ornithology.

In presenting the dates for the species given below, attention might be called to the very short time which some northern birds are absent from the tropics.

The Spotted Sandpiper (*Actitis macularia*) for example, is recorded in every month of the year, except May and June, and this by intermittent observance covering but little more than one year's time. It is, of course, probable that some few individuals of this species may fail to join the northward movement, and for some reason or other, spend the entire breeding season in the tropics; but the arrival of apparently healthy birds in early August, indicates how quickly the return trip is made after the family is reared.

The Semi-palmated Plover (*Egialitis semipalmata*) is still earlier in making the return trip, some arriving on the Isthmus shortly after the middle of July.

Along with the group of early Shore Birds and Swallows, is another Passerine bird which arrives in Panama while it is yet summer in the temperate zone. This is the Yellow Warbler (*Dendroica aestiva aestiva*) which certainly may be found in Panama in every month but June and July. This means that long before the last birds have left the breeding grounds in the northern United States, the advance guard is in Panama. Again, in the spring, when first arrivals are choosing nesting sites as far north as New England many of their kind are still flitting and feeding among the mangoes and guavas three thousand miles southward. Certainly a remarkable distribution.

All birds of the A. O. U. Check-List which were identified with certainty, are included in the following list. For several identifications of subspecies, I am indebted to Mr. W. W. Grant of Englewood, N. J., and Mr. W. de Witt Miller of the American Museum of Natural History.

1. **Larus atricilla.** LAUGHING GULL.—A single individual was seen at the mouth of the old French canal near Colón on December 10 and three more at the same place on December 13, 1911.

2. **Sterna hirundo.** COMMON TERN.—One bird of this species was shot from a flock of the following at Gatún, on December 3, 1911. A single bird was taken on Gatún lake on June 9, 1912.

3. **Hydrochelidon nigra surinamensis.** BLACK TERN.—A few frequented Gatún lake from December 3 to 13, 1911. One specimen taken.
4. **Anhinga anhinga.** WATER TURKEY.—Sparingly resident in the Gatún lake district.
5. **Pelecanus occidentalis.** BROWN PELICAN.—Fairly common on the Atlantic side. Have also seen them on Gatún lake.
6. **Pelecanus californicus.** CALIFORNIA BROWN PELICAN.—Common on the Pacific side.
7. **Fregata aquila.** MAN-O'-WAR BIRD.—A common resident, especially on the Pacific side.
8. **Anas platyrhynchos.** MALLARD.—Seems to be a rare visitor. One seen on a small lake near Miraflores (Pacific side) on November 26, 1911. Only record.
9. **Querquedula discors.** BLUE-WINGED TEAL.—Probably the earliest migrant duck to arrive in Panama. First record is October 14, 1911. A week later it was abundant and for awhile continued so in the marshes around Mindi. Several stomachs were examined and the contents consisted largely of a small round green unknown seed. The flesh was excellent. On one occasion, I found three birds standing leg deep in the soft hydraulic fill of Gatún dam. The last record is February 7, 1912, but the species was abundant only through November, most of the birds apparently going on into South America.
10. **Marila affinis.** LESSER SCAUP DUCK.—A very abundant duck on Gatún lake during the winter months. The earliest record is November 25, 1911, and the latest is March 25, 1912.
11. **Ajaia ajaja.** ROSEATE SPOON-BILL.—One seen at Gatún in November, 1911. Probably a rare resident.
12. **Ardea herodias herodias.** GREAT BLUE HERON.—One positive record on October 29, 1911. This bird was seen at Mindi and inspected closely. In fact, it seemed very reluctant to take wing and only did so after repeated approaches to probably 30 feet. Other records were made at various times, but on June 9, 1912, a heron was shot on the Gatún River which is clearly another species — or at least, another form. I therefore feel some doubt as to all records for this bird, except the one given above, and believe there is a resident heron in Panama entirely distinct from the present species, being slightly smaller and without any rufous on the thighs. So far as I am now aware, it is as yet undescribed.
13. **Egretta candidissima candidissima.** SNOWY EGRET.—One specimen taken at Mindi on September 1, 1912. Probably a rare resident.
14. **Hydranassa tricolor ruficollis.** LOUISIANA HERON.—Sparingly resident.
15. **Florida cærulea cærulea.** LITTLE BLUE HERON.—The most abundant member of the family in Panama. The great majority of the birds are however white. There must be twenty white ones to each blue, with occasionally one of mixed plumage.
16. **Nycticorax nycticorax nævius.** BLACK-CROWNED NIGHT-HERON.

— One specimen taken at Mindi on October 29, 1911. An immature female.

17. **Porzana carolina.** SORA.— On October 1, 1911, Mr. Harry Ferguson of Toro Point shot and presented to me for preservation, a bird of this species. It was, at high noon on a bare coral beach, in the shadow of a high rock cliff, up which it was attempting to climb. Several birds were seen on October 7 and again October 14, 1911, at Mindi.

18. **Ionornis martinica.** PURPLE GALLINULE.— A common resident.

19. **Gallinula galeata.** FLORIDA GALLINULE.— Probably rare. One recorded January 18, 1911.

20. **Himantopus mexicanus.** BLACK-NECKED STILT.— From November 4 to 11, 1911, it was reported to me daily that "a funny snipe with a black back and red legs" was feeding in the west valley of Gatún Dam. I went out and took it on November 11. Except that it was not a snipe, that its back was not black and its legs not quite red, the description was fairly accurate. No others have been recorded.

21. **Gallinago delicata.** WILSON'S SNIPE.— Abundant for a few weeks during October and November. They become much less abundant in December but some birds remain all winter while greater numbers pass on southward. The earliest record is October 7, 1911 and the last January 7, 1912.

22. **Pisobia maculata.** PECTORAL SANDPIPER.— This bird is abundant in the grassy marshes about Mindi for a short period. Dates October 7 to 22, 1911.

23. **Pisobia minutilla.** LEAST SANDPIPER.— These dainty little birds are perhaps the most abundant sandpiper in Panama, except *Actitis macularia*. One was taken at Toro Point on September 4, 1911, and again on August 23, 1912. Last one seen in spring at Gatún, February 18. A large flock spent the entire winter in the hydraulic fill of Gatún Dam.

24. **Ereunetes pusillus.** SEMI-PALMATED SANDPIPER.— Found sparingly with the preceding species. September 4, 1911, to February 22, 1912, are extreme dates for the season.

25. **Totanus flavipes.** LESSER YELLOW-LEGS.— A single specimen of this species was taken at Gatún on August 27, 1911. The next record is October 7, but after that date, it was abundant for some four weeks. November 30 is the last record until March 3, 1912, when one individual was seen.

26. **Helodromas solitarius solitarius.** SOLITARY SANDPIPER. An abundant visitor. September 9, 1911, and September 1, 1912, are fall dates. The last bird was seen February 25, 1912.

27. **Bartramia longicauda.** UPLAND PLOVER.— This species arrived in Gatún, September 12, 1911, and was not rare until December 8, when the last bird was seen. In 1912, the first bird was seen on September 1. For weeks they were in, and around, Gatún daily, feeding and even roosting at the very doors of the quarters. Often at night, they could be heard to cry out in apparent alarm and then trail off into their peculiar soothing notes of content as they were answered by others near.

28. **Tryngites subruficollis.** BUFF-BREASTED SANDPIPER.— One of a pair was taken in a high, dry, pasture near Gatún, on October 18, 1911. Another was seen in the same location on March 29, 1912. Two records only.

29. **Actitis macularia.** SPOTTED SANDPIPER.— This species is present in Panama in all months of the year, except perhaps, May and June. August 31, 1911 and August 4, 1912 are fall dates, and April 24, 1911 and April 28, 1912 are extreme spring dates of departure.

30. **Numenius hudsonicus.** HUDSONIAN CURLEW.— One of the bird surprises of my life was to see a Hudsonian Curlew tip-toe and catch butterflies within twenty feet of my front door at Gatún. The clearings in and around the town seemed very attractive to these birds and they were fairly tame. Marching or advancing by rushes, always with graceful dignity, sometimes singly but more often in groups of four or five, they foraged through the shorter grass, picking up or catching on the wing their insect food. They usually kept near the water's edge or well down in dry gullies but also fed on higher ground at times. The earliest record is of October 1, and the last, November 3, 1911.

31. **Oxyechus vociferus.** KILDEER.— First record, November 26, 1911 and the last, March 3, 1912. This is the only bird of the shore-bird group more abundant in late winter than earlier, which would seem to indicate that Panama is nearly the southern limit of its range.

32. **Ægialitis semipalmata.** SEMPALMATED PLOVER.— The earliest record for this bird is July 23, 1911,— a flock of seven at Toro Point. On August 4, 1912, I visited there again, and found them abundant. January 28, 1912, is the last record.

33. **Catharista urubu.** BLACK VULTURE.— A common resident.

34. **Circus hudsonius.** MARSH HAWK.— This is a common winter visitor. October 24 and April 18, 1911 and 1912 are the extreme dates.

35. **Buteo swainsoni.** SWAINSON'S HAWK.— A female of this species was taken at Gatún on December 8, 1911. The skin was given to Mr. E. A. Goldman to whom I am indebted for confirmatory identification.

36. **Buteo platypterus.** BROAD-WINGED HAWK.— The most common migrant hawk in Panama, but is less in evidence than *Circus hudsonius* or *Falco sparverius* because it usually stays well in the forest. Specimens have been taken, but extreme dates are not recorded.

37. **Falco sparverius sparverius.** SPARROW HAWK.— A common winter visitor around the towns. Extreme dates October 24 and April 5, 1911 and 1912. During this period, they were in almost daily evidence about Gatún. Have heard them call repeatedly as if it were nesting-time back home.

38. **Crotophaga ani.** ANI.— I had expected to find *C. sulcirostris* here but have seen none. This species is one of the most abundant of resident birds.

39. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.— Two records October 22 (specimen) and November 3, 1911.

40. **Ceryle alcyon alcyon.** BELTED KINGFISHER.— Not common. October 1 to March 3 are extreme dates.

41. **Ceryle torquata.** RINGED KINGFISHER.— A fairly common resident.

42. **Ceryle septentrionalis isthmicus.** ISTHMIAN KINGFISHER.— An abundant resident which is included in this list because the range of *americana* is given in the Check-List as south as Panama. This form was separated only last year by Mr. E. A. Goldman.

43. **Chordeiles virginianus virginianus.** NIGHTHAWK.— I do not believe this species winters in Panama. Numbers pass through September 11 to November 29. Specimens taken, October 23. Other dates may, of course, apply to other forms.

44. **Chordeiles acutipennis texensis.** TEXAS NIGHTHAWK.— A pair was taken at Gatún on December 10, 1911.

45. **Amizilis tzacatl tzacatl.** RIEFFER'S HUMMINGBIRD.— The most common member of the family at all seasons.

46. **Tyrannus t. tyrannus.** KINGBIRD.— A rare winter visitor. No extreme dates recorded.

47. **Tyrannus dominicensis.** GRAY KINGBIRD.— Rare. Specimen taken February 14, 1912. May breed sparingly.

48. **Myiarchus crinitus.** CRESTED FLYCATCHER.— A few winter. No extreme dates.

49. **Myiochanes virens.** WOOD PEWEE.— Not uncommon during the winter months. My earliest date is October 15 and the latest is January 14. It is not a silent migrant.

50. **Myiochanes r. richardsoni.** WESTERN WOOD PEWEE.— I have one specimen taken April 4, 1911. I have never seen another bird of the species.

51. **Empidonax flaviventris.** YELLOW-BELLIED FLYCATCHER.— I am not familiar with this species, but have one bird taken January 1, 1912, which I believe belongs here.

52. **Empidonax t. trailli.** TRAILL'S FLYCATCHER.— I took one bird of this species on January 14, 1912. Have no other record.

53. **Icterus spurius.** ORCHARD ORIOLE.— I have seen this bird only in the spring and late winter. It is not common. My earliest record is February 18, 1912 and the latest, March 4.

54. **Icterus galbula.** BALTIMORE ORIOLE.— Have seen this bird but once — when I took a male just acquiring breeding plumage, on February 22, 1912. He was in a large tree on bank of the Rio Chagres with several of preceding species. I looked carefully, but could find no others.

55. **Megaquiscalus major macrourus.** GREAT-TAILED GRACKLE.— A not uncommon resident on the Pacific side of the Isthmus, but less common on the Atlantic side.

56. **Spiza americana.** DICKCISSEL.— Common for about a week or ten days in March. My earliest record is March 6 and my latest, April 5. I have never seen the bird except during the period mentioned.

57. *Piranga erythromelas*. SCARLET TANAGER.— Have seen but one, March 16, 1911.

59. *Progne chalybea*. GRAY-BREASTED MARTIN.— A common resident. Breeds in holes in trees and has also learned to nest within the iron ridge rolls of corrugated iron roofs.

59. *Hirundo erythrogastra*. BARN SWALLOW.— This bird is abundant in both fall and spring but rare in mid-winter. My earliest record is August 23, 1911. Within a week they were abundant and were seen daily until December 5, when they rapidly disappeared. January and February are without a record. On March 17 they reappeared to become again common for six weeks or perhaps less. My last record for 1912, is May 26, when I recorded several. On May 30, 1911, I shot one from a flock of *Iridoprocne albilinca*. It will thus be seen that their local schedule is roughly three months on, and three months off — passing twice in the year.

60. *Riparia riparia*. BANK SWALLOW.— Fairly common for two months in the fall, but much less so in the spring. My earliest record is September 23, 1911, and the latest is November 30, 1911, except a small flight on February 22, 1912.

61. *Mniotilta varia*. BLACK AND WHITE WARBLER.— One specimen of this species was taken on March 26, 1911, the only one I have seen. It was with one Redstart and several Yellow Warblers.

62. *Protonotaria citrea*. PROTHONOTARY WARBLER.— My earliest record for this beautiful species is October 1, 1911. It was occasionally seen until in late November, but I have no December record. The last date is January 29.

63. *Vermivora chrysoptera*. GOLDEN-WINGED WARBLER.— A very rare visitor in my experience. My only certain record is March 10, 1911.

64. *Dendroica aestiva aestiva*. YELLOW WARBLER.— By far the most abundant representative of the family here. I have one female taken August 29, 1911, and one taken August 18, 1912. From late September until the end of the year, I found them common. They are less so in January and February, but are again common in March. My last record is May 12, 1912. Thus one year's record shows an entire absence of this species of but little more than three months. Before the last birds leave this latitude for their breeding range, the first ones are in Nova Scotia, Manitoba and British Columbia.

65. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.— This species is not rare here during the winter months. My earliest record is November 26 and the last is March 31.

66. *Dendroica castanea*. BAY-BREASTED WARBLER.— This is not a rare migrant in November and December. My earliest record is November 3, 1911, and my last is January 1, 1912.

67. *Seiurus aurocapillus*. On November 26, 1911, while hunting in a thicket near Gatún, I heard the familiar call-note of this bird. I answered and called the bird to me. Have seen no other than this specimen.

68. *Seiurus noveboracensis noveboracensis*. WATER-THRUSH.—

A common winter visitor. My extreme dates are October 15, 1911, and April 20, 1912.

69. **Seiurus motacilla.** LOUISIANA WATER THRUSH.— Not common. I have seen it here on October 29, 1911, and again on February 11 and 18, 1912 — a total of three records.

70. **Oporornis formosa.** KENTUCKY WARBLER.— Not a common visitor, but perhaps more winter here than one would think from the number seen. They walk about in the heavy damp jungle, calling with the same unmistakable metallic chirp as they do in their breeding haunts. My earliest record is February 22 and the last is March 24, 1912.

71. **Oporornis philadelphia.** MOURNING WARBLER.— Being unable to accurately distinguish between this species and *tolmei* in the field, I can record with certainty, only two dates for this bird. One male taken at Gatún on April 7 and another on April 28, 1912. It (or *tolmei*) is not rare in October and November and again throughout April.

72. **Wilsonia canadensis.** CANADIAN WARBLER.— I have seen but one bird of this species. A male taken at Gatún on April 28, 1912.

73. **Setophaga ruticilla.** REDSTART.— Not uncommon at times. My earliest record is October 1, 1911, and the last is March 31. The longest interval without a record is January 1 to 23.

74. **Dumetella carolinensis.** CATBIRD.— On February 22, 1911, I saw three birds of this species near Gatún, but have seen it on no other occasion.

GENERAL NOTES.

Holboell's Grebe (*Colymbus holbælli*) at Bedford, Mass.— Feb. 15, 1913, Mr. William H. Simonds found a Holboell's Grebe on the ice of Concord river. The bird was in good condition but apparently exhausted. It was brought to the village and identified and on the next day, the 16th, was carried back to the river bank and apparently there took care of itself and was *thought* to have been seen a day later in open water.— CHARLES W. JENKS, Bedford, Mass.

The Dovekie (*Alle alle*): an Addition to the Fauna of South Carolina.— I am indebted to my friend Dr. Leonard C. Sanford, for the gift of a beautifully mounted specimen of a male Dovekie, which was picked up dead off Beaufort, S. C., in February, 1909, and forwarded to him in the flesh. Mr. H. H. Brimley has recorded the abundance of this bird from Roanoke Island to Beaufort, North Carolina, in January, 1909.

This South Carolina record extends the range of this boreal bird more than two hundred miles to the southward, and is the second species of the Alcidae recorded from the State.— ARTHUR T. WAYNE, Mount Pleasant, S. C.

White Pelican in Colorado.—It is a satisfaction to believe that this species (*Pelecanus erythrorhynchos*) has really not deserted Colorado in its migrations and wanderings. The writer is informed by his old time hunting friend, Mr. W. B. Sheppard, of Fort Collins, Colo., that he saw seven individuals of this pelican on May 17, 1912, on a small lake near Niwot, Colo. While Mr. Sheppard is not even an amateur ornithologist, he is familiar with this species, having seen and studied it many times in the Yellowstone region, and the writer feels that this is a credible record, even if it be one made by sight identification.—W. H. BERGTOLD, *Denver, Colo.*

Hudsonian Godwit. A correction.—In 'The Auk' for April, 1913, the date of the godwits taken at the Magdalen Islands was given as February 18, 1911. This should have been September 18, and in view of their rarity it is perhaps worth while to make the correction.—W. E. SAUNDERS, *London, Ontario.*

Little Blue Heron (*Florida carulca*) at Lynn, Mass.—On April 29–, 30 a bird of this species was seen about a small overflowed bog on a farm known as the Fay estate, near the Salem line. The bird was very tame, and gave us fine opportunities for study; at times it was watched at a range of 200 ft. with a four power field glass. Points noted were the even slaty blue of the body above and below; the fine maroon tint on the head and neck; neck long and much less in diameter than that of the Green Heron; legs long, slender, and dark in color; bill blue next the head, black at point.

On April 30, it was also observed by Mr. Charles Norton.—ARTHUR P. STUBBS, *Lynn, Mass.*

The Whooping Crane (*Grus americana*) in Nebraska.—On October 16, 1912, four of these splendid birds were shot out of a flock of five at Wood Lake, Cherry county, Nebraska, by Mr. Henry T. Clarke, Jr., of Lincoln and a man named Quick who accompanied him. All four of the birds were mounted by Mr. August Eiche, of Lincoln. Three of the cranes were adults, two males and a female, while the fourth was a young female in the beautiful brown plumage. The latter specimen is in the collection of Mr. Eiche, while the others belong respectively to Messrs. Harry H. Harley, William H. Dorgan and Ex-Gamewarden H. N. Miller, all of Lincoln. A few days later, according to Mr. Miller, two more of these cranes were shot by hunters at Grand Island, Nebraska. According to their statements, these hunters mistook the birds for "brant" (*i. e.* Snow Geese). The two Grand Island birds were also mounted. I am indebted to Mr. Eiche for the above data.—MYRON H. SWENK, *Lincoln, Nebraska.*

Stilt Sandpipers (*Micropalama himantopus*) at Ithaca, N. Y.—Following the cold rainy days of the first of August (1912) and coincident with the first flocks of migrating warblers, there occurred through central New York State a considerable migration of Shore Birds. Although a few

had been noted about two weeks previously, this was the first large migration of the fall. In mixed flocks along the head of Cayuga Lake, the following species were abundant: Semipalmated, Least and Pectoral Sandpipers, Sanderling, Lesser Yellow-legs and Killdeer Plover. In addition, Solitary and Spotted Sandpipers, feeding singly, were scattered all along the shore and likewise one Ring-necked Plover. Three days later, I found the same species in greater numbers, and associated with them, a flock of six Knots and one of seven Stilt Sandpipers. The number of Knots did not change, but the flock of Stilt Sandpipers shortly increased to eleven, although all were seldom seen at once. Two White-rumped Sandpipers, two Black-bellied Plovers, a Turnstone, a Greater Yellow-legs, and a Dowitcher soon added themselves to the assemblage. The majority of these birds were adults and still in nuptial plumage. They remained the greater part of a week, when most of them moved on, leaving only a small number of those species which had earlier been the most numerous.

The presence of such a variety of Shore Birds, including the Stilt Sandpipers, induced me to make somewhat extended observations. Accordingly a blind was constructed along the lake shore and many hours were spent in watching their movements. Inasmuch as the Stilt Sandpipers are so generally overlooked on the migration or confused with the Yellow-legs, a few comparative observations on their habits may be of interest.

Although they might have been actually more numerous, the largest number seen together at one time was eleven. Usually they were in groups of from two to six and mingled with the Yellow-legs. The adults of the two species were easily distinguished as many of the Stilt Sandpipers still retained more or less of the breeding plumage with buffy and rufous markings about the head, and heavy bars on the sides and flanks. The immature and molting birds of the two species, however, were much more easily confused for the Yellow-legs lacked the checker-board markings of the adult and approached very closely, in the back pattern, the mottling of the Stilt Sandpipers. The bars on the sides of the young Stilt Sandpipers being very faint, the two birds were therefore outwardly much alike. The color of the legs distinguished them, when these were visible, but when they waded in water an inch or more in depth, even this proved an uncertain criterion as the upper shanks of many of the Yellow-legs were dark. Again in flight, the birds were very similar, although the white rumps and tails of the Stilt Sandpipers seemed less conspicuous than those of the Yellow-legs. The difference in size when the two birds stood side by side was very appreciable but, at other times, was merely confusing.

In their habits, however, the two species were quite different. The Yellow-legs were always rangy birds and covered a great deal of ground while feeding. Even when resting they were conspicuous by the nervous jerking of the head and neck. In flight they usually formed fairly compact flocks but scattered upon alighting. The Stilt Sandpipers on the other hand, were quiet birds and went about their search for food very systematically, gleaning everything in their way. They frequently fed in a

space a few yards square for over an hour at a time. When at rest, they showed none of the nervous traits of the Yellow-legs, being much more sedate, neither jerking the head nor tilting the tail. In flight they were quite similar to the Yellow-legs, but as soon as alighted, they bunched and frequently the whole flock fed with their bodies nearly touching.

Like the Yellow-legs, the Stilt Sandpipers were seldom seen upon the exposed mud but preferred wading where the water was from one to three inches in depth, so that the entire head and neck frequently disappeared beneath the surface of the water while feeding. The notes of the two birds though similar in form, were wholly unlike in quality, that of the Stilt Sandpiper being mellower and lower in pitch.—ARTHUR A. ALLEN, *Ithaca, N. Y.*

Unusual plumages of the Ocellated Turkey (*Agriocharis ocellata*).—Of many females of this turkey that have come under my observation, during three years residence in the southern and central parts of Campeche, Mexico, the plumages of three specimens demand special description. In all three of these birds, the first four of the inner secondaries have their exposed portions of an iridescent green, a subterminal bronzy bar, and the tips of grayish white. The inner secondaries have their exposed parts of a "pepper and salt" pattern, which is lightest on the extreme outer margins and the tips. Unexposed parts of these feathers—that is, the outer halves—are of a dull black, while their main stems are black. Inner halves of all the secondaries dull black at bases, passing to a soiled white on the margins with an inclination toward mottling at the ends.

Primaries clear, sooty black, being blotched with grayish white near bases, especially on the outer vanes.

The remainder of the plumage in these three birds is normal, while the above described departure therefrom, with respect to the wings, is so striking and so conspicuous that it commands the attention of the observer at once and under all conditions.

One of these abnormally plumaged individuals came into my possession alive, but was, unfortunately, killed and eaten by a large hawk a short time afterwards; the remaining two were shot and preserved. Of these, one was shot out of a flock numbering some fifteen or twenty birds on the 25th of September, 1912, it having immediately attracted my attention from the fact that its wing plumage was so different from that of the rest of the flock, all of which wore the normal plumage.

This specimen typifies the rare and unusual coloration described above, it having about completed the assumption of the second plumage, only the outer rectrices of the first plumage not having, as yet, been molted.

My remaining bird was collected on the 9th of November, of the same year, it being associated at the time with another female and two males, all of these last being normally plumaged individuals.

In the wing of this specimen, the first eight primaries of either side present a mottling of grayish white toward their tips. No explanation

has occurred to me for this unusual plumage in *Agriocharis ocellata* other than perhaps it may possibly be due to the prehistoric peoples that at one time densely populated this part of Mexico having domesticated these turkeys, and that some of these aborigines, through artificial selection, produced a variety of the species which, in the long years since those times, has again become mixed with the normal birds in nature, and is now reverting to their plumage.

As a rule, the species assumes and passes through its several plumage states with marked regularity and uniformity; and, as a matter of fact, aside from the three specimens above described and a few instances of partial albinism, no other abnormalities, with respect to this species, have come under my observation.

Apart from such a solution, to my mind it would seem that there is either some cause now operative — or in times past has been operative — which, were it discovered, would explain the necessity for this species to assume a less conspicuous plumage than the strikingly brilliant one which at present characterizes it.— PERCY W. SHUFELDT, *Campeche, Mexico*.

The Passenger Pigeon at the Cincinnati Zoölogical Gardens still living.— Many readers of Mr. Wells W. Cooke's very interesting and instructive paper, "Saving the Ducks and Geese" (*The National Geographic Magazine*, Vol. xxiv — Mch. 1913) have read with deep regret the announcement which he makes in reference to the Passenger Pigeon. He writes — "Today this bird is entirely extinct, the last survivor dying in the Zoo at Cincinnati a few days ago." After reading this sad news, I at once wrote Mr. S. A. Stephan, General Manager of the Cincinnati Zoölogical Co., asking for details and was delighted to receive the following reply under date of May 17. "I have your letter of May 16th, and beg to say that our one remaining Passenger Pigeon is still alive and in as good condition as when I wrote you on Oct. 3rd, 1912." — RUTHVEN DEANE, *Chicago, Ill.*

Nesting of the Barn Owl in Illinois.— The first authentic set of Barn Owl's eggs for Illinois was taken May 20, 1909, in Champaign County by Guy Day of Sidney. This consisted of nine eggs and was collected in my ten-mile radius.

On April 20, 1913, I collected a second set of six eggs in the same Salt Fork creek bottoms nine miles from Philo. Both Owls were flushed from the cavity of an enormous Sycamore overhanging the creek.— ISAAC E. HESS, *Philo, Ill.*

An Unusual Malady and Probable Cause of Death in a Toucan (*Ramphastos carinatus*).— An adult female of this toucan died April 24, 1913, at the establishment of Mr. Edw. S. Schmid of Washington, D. C., who kindly presented me with the specimen the same day. Upon examining its anatomy — an invariable practice of mine with such material before roughing out the skeleton — I found it in fair condition with most

of the general organs healthy. The bird was in the "pin-feather" moult, the ensheathed new feathers of the tail being each about an inch long. Upon removing the skin covering the uropygial gland, I at once observed that the left lobe of that structure was enormously enlarged, and the cause for this was not far to seek. Some superficial inflammation or other at the apex of one of the erupting quill-feathers of the tail on that side had prevented that particular quill from coming out. As it grew, it proceeded to coil upon itself beneath the skin, until two and a half coils had formed, like the coils of the shell of some snails, the transverse diameter of the whole structure being about a centimeter and a half. Apparently the disease was of some standing and the surrounding inflammation, due to the above cause, considerable, which latter — in part at least — may have had its share in causing the death of this bird. Years ago, in my surgical practice, I had a case or two where the hair of the beard in a man behaved in a similar manner, causing an abscess to form which, in one instance, was as large as a hazel nut, the coiled-up hair inside, which gave rise to the trouble, having a length of an inch or more.— R. W. SHUFELDT, *Washington, D. C.*

Road-runner in Colorado.— In the third supplement to Cooke's list of Colorado birds (*Auk*, Oct., 1910, p. 412), there is a record of this species (*Geococcyx californianus*) having been taken at Shawnee (altitude 8125 feet), Platte River, Colo., March 15, 1907.

The following narrative sheds an interesting side light on the possible circumstances bringing about such an unusual record, also giving one an inkling as to what might have occurred in other startling records.

A short time ago the writer was conversing with Mr. A. T. Allen, taxidermist of Denver whose shop he frequently visits, to see if any rare or uncommon birds had been brought in to be mounted. Mr. Allen mentioned the fact that he had mounted a Road-runner which had been brought in to him by Mr. J. W. Price, of Shawnee, Colo., who had shot the bird there on March 15, 1907, this date being a matter of record in Mr. Allen's day book. It seems a fair presumption that the bird recorded by Cooke, and the one just mentioned and mounted by Mr. Allen were one and the same. About a year after Mr. Allen had mounted this particular Road-runner, a customer came into his place of business, and purchased a mounted Road-runner, saying that he lived in the Southwest, where these birds are common, and that it had not occurred to him to take one (alive or mounted) east to show his friends, until he had stopped off on business at Denver, hence his purchase of the mounted bird. Further conversation between this customer and Mr. Allen led the former to tell Mr. Allen that he had a year previously, spent considerable time in Denver, and at that time had with him a tame Road-runner. He kept this bird with him in Denver some time, and then liberated it "up in Platte Canyon" some time previous to March, 1907.— W. H. BERGTOLD, *Denver, Colo.*

Evening Grosbeaks (*Hesperiphona vespertina vespertina*) at **Manchester, N. H.**—On March 6, 1913, at 8 o'clock A. M., I saw seven Evening Grosbeaks in front of the Woman's Aid Home in Manchester, N. H. One was a brilliant male in full plumage, the others varying greatly. They were in a small mountain ash tree, sixteen feet from where I stood, but were not feeding while I watched them. Later in the morning I located them feeding in maple trees, about four blocks distant from the former location, one brilliant male and six others as before. I publish this note in the interest of the Manchester Institute of Arts and Sciences, other members of which have likewise observed grosbeaks recently.—EDWARD H. FOGG, *Manchester, N. H.*

An Abnormal Rose-breasted Grosbeak.—On May 15, some friends informed me that they had seen in this neighborhood a Rose-breasted Grosbeak (*Zamelodia ludoviciana*) with a yellow breast. Taking me to the place where they had seen it, in hopes that it might be nesting, it was found without difficulty. The color of the breast might be termed a light orange.—ROBERT BARBOUR, *Montclair, N. J.*

A Winter Record of the Brown Thrasher in Lancaster, Mass.—During this last winter (1912-1913) a Brown Thrasher (*Toxostoma rufum*) took up his residence in a Colorado Blue Spruce (*Picea pungens*) in front of my greenhouse and apparently had a very comfortable time of it. My gardener became very much interested and every day threw out food and also put the greenhouse cat to "rest."

The bird as far as I could see was not injured or crippled in the least. February 24 and 25, my man said he sang, but as a cold snap came on the 26th, he stopped and never tried it again all winter.—JOHN E. THAYER, *Lancaster, Mass.*

Two Rare Birds for Massachusetts.—I should like to record the recent occurrence in Lexington, Mass., of two birds, rare in eastern Massachusetts. Shortly before seven in the morning, April 26, 1913, a Carolina Wren (*Thryothorus ludovicianus ludovicianus*) passed rapidly northward through my yard, singing loudly. Soon afterward, Mr. Walter Faxon, from his house half a mile to the north, heard the song. An hour later, we followed the wren's northward course for nearly a mile until we overtook him, singing from a tangle of brush. From here he turned squarely to the west and, still in the brush, continued to an alder swamp where he dropped to the ground to feed and stopped singing. We found no further trace of the bird either late in the afternoon of the 26th or the next morning.

The second rarity, a Blue-winged Warbler (*Vermivora pinus*), visited my garden at 5 o'clock in the morning of May 6, 1913. He was in brilliant plumage, showing no trace of mixed blood. He sang from the top of a flowering plum tree the typical *pinus* song,—two drawling, buzzing notes. This bird arrived, doubtless, with the heavy migration wave of the previous

night which brought the orioles and most of the resident warblers, including the Blue-winged Warbler's relative, *V. chrysoptera*.

Mr. Faxon and I were especially interested in the presence of this warbler. In 'The Auk' for October, 1907 (p. 444), Mr. Faxon recorded a male Brewster's Warbler which had spent the preceding summer in Lexington, and in the Memoirs of Museum of Comp. Zool., 1910 (XL, pp. 57-78), he gave a detailed account of two female Brewster's Warblers which, mated with *V. chrysoptera*, bred during the summer of 1910, in the same locality where the 1907 bird was found. Brewster's Warblers have returned to this locality each year since 1910.

In plumage the offspring of all these birds have followed the laws of Mendelian heredity and the inference is that *V. pinus* has bred on some former occasion in the vicinity and that these Brewster's Warblers are a relic of cross breeding. However, with the exception of "A nesting of the Blue-winged Warbler in Massachusetts," by Horace W. Wright (Auk, XXVI, No. 4, October, 1909) in Sudbury, twenty miles to the south, there was, until now, no record of the occurrence of *V. pinus* for this immediate region. The appearance this spring of a pure Blue-winged Warbler within half a mile of the Brewster's breeding ground is a bit of corroborative evidence that from time to time *pure* blood may be introduced into eastern Massachusetts.

Mr. Faxon and I believe that the present bird cannot have been a descendant of a local *V. leucobronchialis*, for the reason that, without exception, the Brewster's Warblers in Lexington sing the *V. chrysoptera* song.—WINSOR M. TYLER, *Lexington, Mass.*

Birds Observed at Bennington, Vermont.—The following species have been noted by Mrs. Ross and myself during the past few years.

Colymbus holbœllii. HOLBÆLL'S GREBE.—190½, Feb. 18, seven taken alive on the snow—unable to fly. 1910, Jan. 1, one taken alive. 1912, Feb. 12, one taken alive. 1913, Mar. 14, one taken alive.

Alle alle. DOVEKIE.—1910, May 31, one taken alive but died the next day. It was mounted and is now in the State Museum at Montpelier. It was in summer plumage.

Sterna hirundo. COMMON TERN.—1907, May 30, one seen.

Aythya marila. AMERICAN SCAUP DUCK.—1911, Oct. 25, one shot.

Harelda hyemalis. OLD SQUAW.—1911, Nov. 13, one shot.

Rallus elegans. KING RAIL.—1910, one spent the month of May in a swamp in this town.

Calidris arenaria. SANDERLING.—1911, Sept. 25, one taken alive but injured; lived only a few days. Mounted and is in the State Museum.

Limosa hæmastica. HUDSONIAN GODWIT.—1911, Sept. 5, one taken alive with a broken wing.

Aquila chrysaëtos. GOLDEN EAGLE.—1911, Oct. 26, one shot—mounted and is in a private collection.

Corvus corax principalis. NORTHERN RAVEN.—1909, Nov. 7, one shot — mounted and is in a private collection.

Hesperiphona vespertina vespertina. EVENING GROSBEEK.—1909, a flock numbering between 30 and 40 remained in and about the village for about 3 weeks—were first seen April 1, last seen April 18. 1911. A flock of 5 were first seen March 27, and were seen three or four times for a week. 1913. A flock of 25 or 30 were first seen January 1, and have been seen many times by many observers on different dates—were last seen by myself April 20.

Passerherbulus henslowi. HENSLOW'S SPARROW.—Nested in 1909, 1911, 1912.

Dendroica tigrina. CAPE MAY WARBLER.—1912, a large migration during May—the only migration observed in 10 years. One was found dead which was mounted and is in a private collection.

Icteria virens virens. YELLOW-BREASTED CHAT.—1912, June, one pair nested.

Penthestes hudsonicus hudsonicus. HUDSONIAN CHICKADEE.—1912, Dec. 26, one seen.—LUCRETIVS H. ROSS, M. D., *Bennington, Vermont.*

Some Birds of Southwestern Missouri.—Bewick's Wren (*Thryomanes bewicki bewicki*) prior to 1907 had not been listed from the western central section of Missouri. It was not seen by W. E. D. Scott, neither was it mentioned in Mr. Widmann's catalogue of Missouri birds issued several years ago. The species is apparently extending its range as the following notes would indicate.

May 30, 1907. Saw two specimens.

March 24, 1909. Saw and heard half a dozen Bewick's Wrens.

March 29, 1909. Saw Bewick's Wren to-day and have seen numbers since the 24th.

April 21, 1910. Saw one carrying twigs into a paste-board box on top of a trash heap. (The nest was destroyed later.)

April 2, 1912. Heard two or three to-day.

April 12, 1912. Have heard several each day since the 2nd.

April 27, 1912. Have heard several each day since the 12th.

May 19, 1912. Have heard them occasionally since the last record

June 3, 1912. Heard one to-day,—the only one since May 19.

June 22, 1912. Heard one to-day. (Must be nesting.)

March 20, 1913. Saw and heard one to-day.

May 21, 1913. Have seen and heard a number since March 20.

The Evening Grosbeak (*Hesperiphona vespertina vespertina*) has been considered a rare bird in Missouri. My first record is Jan. 31, 1911, when three males were seen. They were observed in varying numbers from three to thirteen a number of times, until April 27, the last record.

Red Crossbills were seen almost daily between the dates of February 23, 1911, and March 24, 1911. This was a small flock numbering only five or six.—A. F. SMITHSON, *Warrensburg, Johnson Co., Mo.*

Birds of the Headwaters of the Gila River, New Mexico: Further Records.— I desire to add three more species to the list published in Vol. XXIV, Auk, p. 327. All of these three species were taken at the G. O. S. Ranch, on Sapillo Creek, N. Mexico and are as follows:—

Astur atricapillus striatulus. WESTERN GOSHAWK.— One (♂) shot Oct. 7, 1912.

Archibuteo ferrugineus. FERRUGINOUS ROUGH-LEG.— One (♂) shot Oct. 14, 1912.

Calcarius ornatus. CHESTNUT-COLLARED LONGSPUR.— A moderate sized flock lingered in the grain stubble from Oct. 13, to (at least) Oct. 21, 1912.— W. H. BERGTOLD, *Denver, Colo.*

Double Bird Tragedy.— About eight o'clock May 6, 1913, painters working on a forcing house on the grounds of the New York Agricultural Experiment Station at Geneva, N. Y., were startled by the headlong flight past them of two birds. One was evidently frantic with terror from pursuit, the other conscious of nothing but its prey, for both birds rushed heedlessly past the men and after a flight of five or six rods more, dashed headlong into the plate-glass window of the residence of the Station Director, who, with his family, was away from home. The glass was not broken but the birds were both instantly killed, either by the shock or by breaking their necks. The concussion was heard by the forcing-house man at his work and he, with the painters, went to the place and picked up the birds. These were later identified by Mr. B. B. Fulton, Assistant Entomologist of the Station, as a Hermit Thrush and a Sharp-shinned Hawk, and the identification was later confirmed by the writer. The thrush is migratory here, the hawk resident but not abundant.— F. H. HALL, *Geneva, N. Y.*

Æsop as a Bird Observer.— Under the title of "Two ornithological fables from Louisiana" there appeared a note in 'The Auk' for April, 1913, p. 282, by W. L. McAtee, wherein two tales or fables relating to bird life were recited.

The first of these, concerning an alleged interesting fish-catching habit of *Mycteria americana*, is beyond the writer's power to verify. If the story, or at least the substance of it, be true, the easiest explanation at hand is that given by Mr. McAtee, i. e., that the scales allure small fishes in search of food and that these, rising to the surface in great numbers to nibble at the bait, are devoured by the Ibises.

The second tale, however, is of course to be relegated to the realm of myth and is as old as Æsop. As it is very beautiful and of great ethical importance in the proper education of good boys and girls, besides being of interest owing to its great antiquity, it deserves to be quoted in the original. The Latin is taken from an edition entitled "*Æsopi Fabulae Graeco-Latinae*," &c., Eton, 1807, II, p. 26, and is a model of brevity:

"Formica sitiens descendit in fontem, ac tracta a fluxu, suffocabatur.

Columba vero, hoc viso, ramum arboris decerptum in fontem projecit, super quo sedens formica evasit. Auceps autem quidam post hoc, calamis compositis, ad columbam comprehendam ibat. Hoc autem viso, formica aucupis pedem momordit; ille vero dolens, et calamos projecit, et, ut columba statim fugeret, auctor fuit. Affabulatio: Fabula significat, opertere benefactoribus gratiam referre."

Which, freely translated, reads about as follows:

An ant, being thirsty, went down to a well, but, being carried along by the flow of water, was nearly drowned. A dove, however, seeing this, picked a twig from a tree and threw it into the well, and the ant, sitting upon it, made its escape. Later a bird catcher, armed with arrows, intended to secure the same dove. But when the ant saw this, she bit the foot of the bird hunter. Feeling the sudden pain, he dropped the arrows, and caused the dove to fly away at once. Moral: It is of importance to show gratitude to your benefactors.

As *Æsop* flourished (if he flourished at all) about 600 B. C., it will be seen that this remarkable tale is old indeed. It may with propriety be suggested that aspiring naturalists and especially those interested in zoölogy devote part of their earliest attention to this cheerful ancient mythologist, or at least to the collection of fables bearing his name. They will go far toward proving the truth of the old saying that "nothing is new under the sun." — S. M. GRONBERGER, *Washington, D. C.*

RECENT LITERATURE.

Ridgway's 'Color Standards and Color Nomenclature.'¹—Twenty-seven years have elapsed since the publication of Mr. Ridgway's "Nomenclature of Colors for Naturalists." Although this work at once became the standard for almost all descriptive work involving color names, the author realized its imperfections and within two years set about gathering materials for the more comprehensive treatise which is now before us. Probably no one in this country is better qualified for the task than Mr. Ridgway as he combines the artist's knowledge and appreciation of color with a large experience in matching colors in nature and a keen perception of minute differences in color tones.

¹ Color Standards | and | Color Nomenclature | By | Robert Ridgway, M. S., C. M. Z. S., etc. | Curator of the Division of Birds, United States | National Museum. | With Fifty-three Colored Plates | and | Eleven Hundred and Fifteen Named Colors. | Washington, D. C. | 1912. | Published by the Author. | Svo. pp. 1-43, pl. I-LIII. Price \$8. (cash with order), postage extra, registered 20 cts.

As was to be expected the treatment in this work is thoroughly scientific. The spectrum is divided into 36 colors which run in oblong blocks across the middle of the first twelve plates, three shades to a plate. Immediately above these is another series of 36 colors each one differing from its respective spectrum color by a definite admixture of white. Above these are two more series each with a larger proportion of white while below the spectrum colors are three series of shades differing from the latter by successive admixtures of black. We have therefore six shades based upon each of the 36 spectrum colors ranging upward toward white and downwards toward black.

Beginning with plate 13 we have the whole series over again with a definite proportion of neutral gray added to each of the 216 shades, and on the following plates additional series with two, three, four and five proportions of neutral gray added. As the whole scheme gradually tends toward a uniform gray tint the number of shades that are distinguishable decreases as we advance so that the latter series do not contain as many blocks as the earlier ones.

Every one of the 1115 shades is named and Mr. Ridgway has searched the literature and even trade catalogues for color names already in use. While the shades represented seem to be about all that the average eye can distinguish, nevertheless the author finds that 36 of the named colors in this former 'Nomenclature' fall between some of those here depicted, consequently they are dropped and their true position indicated in a table. Unfortunately many well known names fall in this way, but ornithologists who have seen so many familiar generic and specific names sink into oblivion can probably part with such terms as 'buff,' 'canary yellow,' 'azure blue,' 'ochraceous,' 'vermilion,' 'violet,' etc. without serious inconvenience. Indeed the use of some of these names like that of the discarded technical terms has been so abused that it is better after all to avoid them.

A complete catalogue of color names with plate reference makes it easy to find any shade that may be referred to, while an understanding of the arrangement of the plates enables one to find all the 'reds' or 'blues' without delay for purposes of comparison.

The whole plan is discussed in detail in the 'Prologue' with reference to various works dealing with the subject.

In order to avoid the possibility of variation in the tints in the individual copies, each color, for the entire edition, was painted uniformly on large sheets of paper from a single mixture of pigments, these sheets being then cut into the small oblongs which represent the colors on the plates.

Mr. Ridgway's volume forms a color standard which is about as nearly perfect as it can probably be made. It is absolutely indispensable to the working naturalist not only as a guide to the nomenclature of his own descriptions, but as a key to the descriptions of others. That it will long remain the standard work of its kind goes without saying and both naturalists and artists should be deeply grateful to Mr. Ridgway for the years of labor that he has expended upon this work.—W. S.

Swann's 'A Dictionary of English and Folk-Names of British Birds.'¹—Bird students cannot but speculate upon the origin of the various vernacular names which they encounter in the literature of ornithology and as few are students of philology or folk-lore Mr. Swann's handy volume comes as a welcome work of reference in which we may find the answer to many a question. He presents a list of upwards of 5000 names which have been applied to British birds, arranged alphabetically, with their meaning and origin where traceable, and accompanied by fables and verses, regarding the various species, which have been handed down in the folk-lore of England. As most of the American bird names are adapted from those of English species, the work appeals alike to ornithologists on both sides of the Atlantic.

The author finds the "Avium Praecipuarum Historia" of W. Turner 1544 to be the first work containing a list of birds with English names affixed, and beginning with this and the occasional bird names of Chaucer, he has traced the varying nomenclature through a long list of publications which are cited in the bibliography.

The longer articles contain much interesting reading. We find under 'Barnacle-Goose,' the ancient belief that these geese were hatched directly from barnacles which fell from a tree called the Goose-tree, but it is further pointed out that the name 'Bernicle' probably referred originally to the bird and that its application to the cirriped was secondary. 'Brant' we find is derived from the Welsh 'brenig' a limpet, doubtless from some similar association. 'Cob' and 'Pen' we learn were old names for the male and female Swan, while 'Ruff' and 'Reeve' for the sexes of the Ruff, the question being still open as to whether the bird was named after the Elizabethan frill or the frill after the bird.

'Bittern' comes from *Botaurus* originally *boatum tauri*, the 'bellowing of a bull'; 'Cormorant' from *Corvus marinus*; 'Sea Crow,' and 'Lapwing' from the Anglo Saxon *Hleapewince*, 'one who turns in running or flying.'

Among the many interesting scraps of folk-lore we may mention the legend of the Crossbill having acquired its twisted beak from striving to draw the nails that held Christ to the Cross; also the verse regarding the Carrion Crow:

One's unlucky,
Two's lucky;
Three is health;
Four is wealth;
Five is sickness,
And six is death.

¹ A Dictionary | of | English and Folk-Names | of | British Birds, | With their History, Meaning and first usage: | and the Folk-lore, Weather-lore, Legends, etc., | relating to the more familiar species. | By | H. Kirke Swann. | Witherby & Co., | 326 High Holborn, London W. C. | 1913. 8vo, pp. i-vii, 1-266. 10 shillings net.

and that referring to the Magpie

One is sorrow, two mirth,
Three a wedding, four a birth,
Five heaven, six hell,
Seven the de'il's ain sell.

Ancient Swan-worship is referred to and the survival to the present day of the ancient oath, in the form 'I swan' or 'I swanny.'

The only criticism that we would make of this valuable book is the need of fuller cross references. Under 'Swan' we find, "see mute-Swan" (p. 163) while as a matter of fact there is more information regarding Swans under Whooper Swan (p. 253) than under the reference cited, and such general terms as Sandpiper, Gull, Owl, etc. are not to be found at all, though under some one of the species doubtless the origin of the names is explained.—W. S.

Chapman's 'Color Key to North American Birds.'¹—This is a new edition of Mr. Chapman's well known and useful volume. The main text is unchanged but the Systematic Table presents all the species and subspecies of North American Birds with their nomenclature revised to and including the last supplement to the American Ornithologists' Union's 'Check-List,' while an Appendix explains in detail the changes that have taken place since the first edition of the 'Color Key,' and presents descriptions of the forms that have been added to the list.

A second appendix consists of a 'Faunal Bibliography,' of publications dealing with the birds of various localities in North America arranged by states and provinces. This is very complete and is the most important list of the kind since that published by Dr. Elliot Coues as an appendix to his 'Birds of the Colorado Valley' in 1878. It will prove indispensable to those who are forming a collection of works on North American ornithology. With all its good features retained and the valuable additions to which we have alluded the 'Color Key' should continue to hold its deservedly popular place in American bird literature.—W. S.

Hornaday's 'Our Vanishing Wild Life.'²—So numerous are the publications treating of wild-life conservation and so similar are many of them, that the average reader is inclined to pass by any new contribution to the

¹ Color Key to North American Birds. With Bibliographical Appendix. By Frank M. Chapman, Curator of Ornithology in the American Museum of Natural History. With Upward of 800 Drawings by Chester A. Reed, B. S. Revised Edition. New York. D. Appleton & Company. 1912. 8vo., pp. i-x, 1-356. Cloth, \$2.50 net. Postpaid, \$2.74.

² Our Vanishing Wild Life. Its Extermination and Preservation. By William T. Hornaday, Sc. D., Director of the New York Zoölogical Park; author of "The American Natural History"; Ex-President of the American Bison Society. With Maps and Illustrations, New York, New York Zoölogical Society, 1913. 8vo, pp. i-xvi, 1-411, net \$1.50 (Chas. Scribner's Sons, N. Y. City).

subject, so that in a way it fails of its mission. It is gratifying therefore at a time when the support of the entire country is necessary, to the success of this movement to find a work such as Dr. Hornaday's which in originality of illustrations and method of presentation, *compels* the attention of everyone into whose hands it finds its way.

The first paragraphs of the preface sound the key note of the work: "Beyond question, we are exterminating our finest species of mammals, birds and fishes *according to law!* I am appalled by the mass of evidence proving that throughout the entire United States and Canada, in every state and province, the existing legal system for the preservation of wild life is fatally defective. There is not a single state in our country from which the killable game is not being rapidly and persistently shot to death, legally, or illegally, very much more rapidly than it is breeding, with extermination for the most of it close in sight. This statement is not open to argument; for millions of men know that it is literally true. We are living in a fool's paradise." In the 44 chapters into which the work is divided every phase of the subject is considered and the terse and forceful comments of the author follow the quotations on the title page "Hew to the line! Let the chips fall where they will"; "Nothing extenuate, nor set down aught in malice."

The book is a mine of information for the army of people who are enlisting in the effort to save our wild life from extermination and they can obtain here in concise form the facts and arguments that they require in carrying on the campaign.

There is a strong 'Foreword' by Dr. Henry Fairfield Osborn, President of the New York Zoological Society and a fitting dedication to Mr. William Dutcher, President of the National Association of Audubon Societies and "life-long champion of American birds."

All friends of wild life owe a debt of gratitude to Mr. Hornaday and to the New York Zoological Society for the preparation and publication of such a work.

The Zoological Society's Bulletin for May, 1913, contains reproductions of many of the illustrations of Mr. Hornaday's work, with a fine colored plate of birds threatened with extinction and strong articles on Wild-life conservation.—W. S.

Mathews' 'The Birds of Australia.'¹—Three parts of Mr. Mathews' great work have appeared since our last issue. Part 5 of Volume 2 completes the account of the Pacific Gull and covers the Skuas, while the two parts of volume 3 deal with the Charadriiformes, treating of the *Morinellidæ* (Turnstones), *Hæmatopodidæ* (Oyster catchers), *Charadriidæ* (Plovers) *Recurvirostridæ* (Stilts and Avocets), and *Scolopacidæ* (Snipe etc.).

¹ The Birds of Australia. By Gregory M. Mathews, Vol. II., pt. 5, January 31 (pp. 477-527, pll. 121-124, Contents, Preface etc.); Vol. III., pt. 1, April 2 (pp. 1-104, pll. 125-137); pt. 2, May 2, (pp. 105-204, pll. 138-150). Witherby & Co., 326 High Holborn, London.

In discussing the Skuas, Mr. Mathews contends that the Pomerine Jaeger is much more closely allied to the true Skuas than to the other Jaegers, but as all three Jaegers differ from one another he proposes to place each in a genus of its own while he uses *Catharacta* Brünnich for the Skuas. *Stercorarius* is restricted to include only *S. parasiticus*; *Coprotheres* Reichenbach is used for *S. pomerinus* and *Atalolestris* gen. nov. is erected for *S. longicaudus*. *Catharacta lonnbergi clarkei* from the South Orkneys is described as new (p. 494), also *C. l. intercedens* from Kerguelen Isl. (p. 494) and *C. maccormicki wilsoni* from Weddell Sea (p. 495).

Mr. Mathew's rejection of Brisson's genera enables him to use *Catharacta* for the Skuas which would otherwise be untenable on account of the earlier *Catarractes*. We cannot agree with his attitude in the Brisson controversy. This is one of a number of mooted questions upon which the International Code may be differently interpreted and if we reject the vote of the Commission in these cases and insist on our personal views we might as logically do so in regard to the code itself. Uniformity is hopeless unless the vote of the Commission on such cases is accepted. Under the *Charadriiformes* we find a number of new generic names proposed viz.: *Afribex*, type *Vanellus lateralis* Smith (p. 41); *Rogibyz*, type *Xiphidiop-terus cucullatus* (Temm.) (p. 41); *Pagoa*, type *Charadrius geoffroyi* Wagl. (p. 82); *Eupodella*, type *Charadrius veredus* (p. 83) *Pagolla*, type *Charadrius wilsonia* Ord. (p. 83) (*Octhodromus* being untenable on account of the prior *Octhedromus* Le Conte); *Afroxyechus*, type *Charadrius tricoloris* Vieill. (p. 124); *Elseya*, type *Charadrius melanops* Vieill. (p. 125); *Zarapita*, type *Numenius tenuirostris* Vieill. (p. 168); *Vetola*, type *Scolopax lapponica* L. (p. 191).

Also in spite of the fact that Mr. Mathews repeatedly states that he does not use subgenera we find three new names of this rank proposed on p. 114: *Pernettyya*, type *Charadrius falklandicus*; *Helenaegialus*, Lath. type *Ægialitis sanctæhelenæ* Harting and *Paroxyechus*, type *Ægialitis placida* Gray and on p. 12 *Prohæmatopus*, type *Hæmatopus quoyi* Brab. & Chubb.

There is considerable discussion of exotic species under each generic heading and the history of generic subdivisions is given at length.

We find *Ægialitis mongolus* referred to a distinct genus *Cirrepidesmus* Bonap., while the Curlews are divided and *Numenius hudsonicus* and *N. borealis* are referred to *Phæopus*.

We note but one new subspecies *Hypsibates leucocephalus timorensis* E. Timor (p. 150).

Mr. Mathews' extreme views upon generic subdivision bring into use many names usually relegated to synonymy and these together with the new ones which he proposes will provide names for almost, if not quite all the groups of *Charadriiformes* that can possibly be differentiated. Whether his nomenclature will be followed by others is open to question. His aim to be consistent in the amount of differentiation necessary for the recognition of a separate genus is praiseworthy, but consistency in judging questions of degree of difference involves the personal equation and can only be settled by the vote of a committee.

These parts of Mr. Mathews' work fully maintain the standard of their predecessors. We note with regret that while carefully designating type species for his new genera he still neglects to cite type specimens for his new species or subspecies.—W. S.

Official Check-List of the Birds of Australia.¹—A Committee of the Royal Australasian Ornithologists' Union has been at work on a Check List of the birds of Australia for the past ten years. It is natural therefore that the result of their long deliberations which is at last before us should have been looked forward to with considerable interest. However it may appeal to Australian bird students, it must certainly be disappointing to progressive ornithologists in other parts of the world.

The Committee carries the principal of priority for genera, species and subspecies, no further back than the 'works' of John Gould 'entitled, "The Birds of Australia."' Gould's names however are superseded (a) "where they were preoccupied in some other branch of zoology, (b) where there had been a clear mis-identification of extra-limital and other forms, (c) where in the light of later knowledge genera had been rejected or new genera created, and (d) manifest errors." For admitted genera, species and subspecies described since the dates of the respective issues of Gould's works, and prior to the dates of the British Museum Catalogue of Birds, the names of the latter work are adopted subject to the above exceptions, while for admitted genera, etc., described later, the name used by the author has been "as far as possible accepted." Along with this we have a statement that a binomial nomenclature is used throughout, and that "all modifications of species ranging to and comprehending subspecies are brought into classification and named, but geographical races are not so, unless such modifications present some material distinguishable differences."

These principles we think constitute the most remarkable 'Code of Nomenclature' that has been framed in recent times.

The Committee would have accomplished its purpose and have freed itself from much adverse criticism if it had adopted the suggestion of Sir E. Ray Lankester, which is quoted on p. 13, and simply presented an 'authoritative list of names' without attempting to cite any rules or explanations.

As it is, the members seem to have failed utterly in comprehending the problem before them. They were surely aware of the fact that in ornithology as in every branch of zoology and botany we are confronted today

¹ Official Check-List of the Birds of Australia by Check-List Committee, Royal Australasian Ornithologists' Union. Adopted at Launceston, 19th November, 1912. With Report. Melbourne: Walker, May & Co., Printers, Mackillop Street. 1913. Supplement to "The Emu," Vol. XII, January, 1913. 8vo, pp. 1-116. Price to Non-Members, 5 shillings. Address Hon. Secretary R. A. O. U., Zool. Gardens, Melbourne.

by a host of names for almost every species and genus, due largely to the carelessness and lack of opportunity of our predecessors. If we are provincial enough to shut ourselves off from the rest of the world and adopt a set of names that suits our fancy, well and good, but we cannot expect others to adopt our list, and if they follow our principle we shall have as many sets of names as there are countries and there will be no universal language of science.

There is no way to abolish the host of names already coined, and the clamor to preserve 'time-honored names' is ridiculous. Not only do we all differ as to what names are 'time-honored' but the loudest claimants for such action do not hesitate to subdivide old genera and so wipe out one half of each 'time-honored name,' as effectually as if done by the principle of priority. Therefore the International Zoological Congress established its Commission on Nomenclature which has prepared a code and which renders opinions upon questions that give rise to different personal interpretations. The only way to secure uniformity in nomenclature is to follow absolutely *both the Code and the Opinions* of the Commission. Any individual or committee that sets up a new point of departure for nomenclature or his own personal opinion in opposition to that of the Commission hinders by so much the realization of that end.

In the case of the present 'Check List' we fear that the progress of ornithology in Australia has been to some extent hindered although the progressive bird students of the country fortunately possess in Mr. Gregory M. Mathews' 'Reference List' an admirable check-list of Australian birds on advanced lines, following rigidly the International 'Code' and 'Opinions' except in the failure of the author to recognize Brisson's genera, a stand that we have always sincerely regretted. It is unfortunate that the Australian Committee could not have seen its way clear to avail itself of Mr. Mathews' laborious researches in nomenclature and so establish today as the official Australian nomenclature, what will inevitably sooner or later supersede that which is here presented.

In matters of the recognition of subspecies and subdivision of genera we cannot expect uniformity except by the majority vote of a committee, as the personal equation has here to be reckoned with and no code can settle the questions involved. Therefore we must expect differences in the number of forms included in the present list and that of Mr. Mathews. In its acceptance and rejection of forms however the Committee, apparently fails to comprehend the true nature of a subspecies. For instance it recognizes two subspecies of *Synorius* as occurring in Tasmania, whereas, if there are two recognizable forms it is the different environmental conditions of Tasmania and Australia which have differentiated the two forms. If both occur together then we have either two distinct species or a mere case of individual variation which requires no recognition in nomenclature. Just how 'subspecies' and 'geographic races' are differentiated, too, is not clear. Mr. Mathews regards the form just mentioned as a very questionable 'geographic race' yet the committee establishes it as a 'subspecies' with a binomial name!

The rules governing family and subfamily names are not given but we fail to see how the name *Peltohyatinae* can be used when *Peltohyas* has been rejected in favor of *Eudromias* for the only species of the group, *E. australis*, which is the monotypic type of *Peltohyas*!

We regret exceedingly that we cannot endorse this Check-List for general use. Aside from all questions of nomenclature, it would serve a valuable purpose as a conservative list of Australian species and subspecies; but here it fails, in-as-much as the lack of synonymy makes it difficult or impossible to ascertain with which forms the many recently described races have been united.—W. S.

Riley on Birds of the Mount Robson Region.¹—During July, August and September, Messrs. J. H. Riley and Ned Hollister of the U. S. National Museum joined the expedition of the Alpine Club of Canada to the Mt. Robson region of the Canadian Rockies, for the purpose of making a general survey of the fauna and flora. The general account of the expedition has been published in volume IV of the Club's Journal while this special number contains the scientific reports.

Mr. Hollister contributes an account of the mammals, and a list of the reptiles and batrachians, Mr. Riley reports on the birds and Mr. Paul C. Standley on the plants. The route included Jasper House, Henry House, then through the Yellow head Pass and up the Moose River to Moose Pass and Moose Pass branch of the Smoky River, with a stay on the Fraser River east of Moose Lake on the return.

Seventy-eight species of birds are listed including a Song and Fox Sparrow which Mr. Riley has described as new in a previous paper. Bohemian Waxwings were evidently breeding on the west fork of the Moose River, as a specimen obtained July 14 contained an egg nearly ready to be deposited. These birds were much paler than winter examples and similar individuals undoubtedly, as Mr. Riley suggests, formed the basis for Reichenow's subspecies *Bombycilla garrula pallidiceps* from Shesly River, B. C.

Mr. Riley found *Zonotrichia gambeli* and *Z. leucophrys* apparently nesting in the same spot while *Junco hyemalis hyemalis* and *J. oreganus shufeldti* were nesting together at Henry House, Yellowhead Pass and at the foot of Moose Pass, with no sign of intergradation. On the strength of this evidence he ranks them as distinct species. *Penthestes hudsonicus columbianus* is recognized as a distinct form and *Lagopus leucurus peninsularis* is considered as no more distinct from true *leucurus* than is *L. l. altipetens*, the two being respectively the northern and southern extremes of the White-tailed Ptarmigan. Mr. Riley contends with apparent justice that both or neither should be recognized.

¹ Birds Collected or Observed on the Expedition of the Alpine Club of Canada to Jasper Park, Yellowhead Pass, and Mount Robson Region. By J. H. Riley. Canadian Alpine Journal, Special Number. Alpine Club of Canada (Treas. S. H. Mitchell, Sidney, Vancouver Island, B. C.) 8vo, pp. 1-97 (Birds 47-75). Price \$1.00.

Interesting observations are given on the plumage of grouse and ptarmigan, and of the young of the Pipit.

The paper is a valuable contribution to the ornithology of an interesting region and will aid materially in ascertaining the exact range and relationship of the birds of the northern Rockies.—W. S.

Riley on New Neotropical Birds.—Through the courtesy of Mr. Chas. T. Ramsden, Mr. Riley was enabled to examine a series of the resident King Rail of Cuba which, as he had suspected,¹ proved to be separable and is consequently named, *Rallus elegans ramsdeni*.

Three Hummingbirds of the genus *Chlorostilbon* in the U. S. National Museum, obtained on the Purus River, Brazil, are found by Mr. Riley to be unlike any known species of the genus and are described² as *Chlorostilbon puruensis*.

Owing to the transfer of the name *Tanagra* from the Blue Tanagers to the Euphonias Mr. Riley considers that *Euphonia sclateri* Sundeval 1869, now *Tanagra sclateri*, renders *Tanagra sclateri* Berlepsch 1880 untenable for the Blue Tanager of Trinidad, and renames it *Thraupis episcopus nesophilus*.³ We cannot however see the necessity for such action. The two species were described under different generic names and are still in different genera.—W. S.

Todd on the Genus Chæmepelia.⁴—We seldom find a more elaborate or painstaking monograph than that which Mr. Todd here presents on the Ground Doves. Incidentally it illustrates how apt we are, in our haste to propose new names and straighten out matters of nomenclature, to overlook the work of our predecessors along the same lines. This genus has been a storm center in such matters. Some years ago diverse opinions were held as to whether the Linnæan name *passerina* should apply to the Jamaican Ground Dove or to that of the southeastern United States, one receiving one new name and the other two, in consequence. Then came a controversy as to whether *Columbina* or *Chæmepelia* was the proper name for the genus. This was referred to a national and international committee with the result that it was declared still an open case to be settled by the first person to definitely designate a type. An immediate designation followed.

Mr. Todd however, by a little bibliographic research now shows us that

¹ The King Rail of Cuba, By J. H. Riley, Proc. Biol. Soc. Wash., XXVI, pp. 83-86, March 22, 1913.

² A New Hummingbird of the Genus *Chlorostilbon* from Brazil. By J. H. Riley, do. pp. 63-64, March 22, 1913.

³ A New Name for *Tanagra sclateri* Berlepsch. By J. H. Riley, do., XXV, pp. 185-188. December 24, 1912.

⁴ A Revision of the Genus *Chæmepelia*. By W. E. Clyde Todd. Ann. Carnegie Mus. VIII, pp. 507-603, May 8, 1913.

all the discussions and publications bearing upon this subject were superfluous as G. R. Gray had settled the generic question definitely and conclusively as long ago as 1841, while Bonaparte in 1855, had settled the former problem with equal finality!

Mr. Todd's studies have been based upon a series of 1920 specimens representing all the known forms while his exhaustive synonymy has been personally verified with the exception of about fifty references and all but a half dozen of these have been checked up by correspondents. Full descriptions and measurements are presented for each form, with a discussion of distribution and nomenclature, while a full list of localities and specimens, and a key to the species and subspecies are added.

Sixteen races of *Chamepelia passerina* are recognized, two of *minuta*, two of *rufipennis* while *buckleyi* and *talpacoti* remain undivided. The name *passerina* is used for the bird of the southeastern United States, as long ago restricted by Bonaparte; *pallescens* for that of the west, while *bahamensis* is used for the Bermuda form, which proves not separable from that of the Bahamas, from which islands it was probably introduced rather than from the mainland. The other races are *neglecta* from Panama to Guatemala; *socorroensis*, Socorro Island; *parvula* subsp. nov. from Honda, Colombia; *nana* subsp. nov., Jimenez W. Colombia; *quitensis* subsp. nov., Quito, Ecuador; *grisola*, Guiana and Amazonia; *albititta*, N. Venezuela and Colombia and the Leeward Islands; *antillarum* Grenada to Barbados; *trochila*, Porto Rico to St. Lucia; *aflavida*, Cuba and Haiti; *insularis*, Grand Cayman, Little Cayman and Cayman Brae; *jamaicensis*, Jamaica; *exigua*, Mona and Great Magna.

C. minuta minuta ranges over most of S. America; while *C. m. elatodes* occurs from west central Colombia to southern Mexico. *C. rufipennis rufipennis* occurs from South America to Guatemala and *C. r. eluta* in the 'tierra caliente' of Mexico.

Mr. Todd's paper is a model piece of work and clears up the relationships of a group of birds which was badly in need of revision.—W. S.

Cory on New Neotropical Birds.¹—Mr. Cory here presents some results of his studies of the birds obtained on the recent museum expeditions to Venezuela and Peru undertaken by Mr. W. H. Osgood, Mr. Ned Dearborn and others. The following forms are described without further comment: *Nothocercus julius venezuelensis*, Paramo de Tama, Ven.; *Eupsychortyx cristatus continentis*, El Panorama, Ven.; *Urochroma costaricensis*, Limon, C. R.; *Piaya cayana venezuelensis*, Orope, Ven.; *Momotus osgoodi*, El Guayabal, Col.; *Scytalopus magellanicus grandis*, Tambo Ventija, Peru; *Threnetes frazeri venezuelensis*, Orope, Ven.; *Anthracothorax prevosti viridicordatus*, El Panorama, Ven.; *Glaucis hirsuta fusca*, Orope, Ven.; *Thau-*

¹ Descriptions of Twenty-eight New Species and Subspecies of Neotropical Birds. By Charles B. Cory. Field Museum of Nat. Hist. Publication 167. Ornithological Series, Vol. I. No. 7. May 31, 1913. pp. 283-292.

mastura cora montana, Hda Llagueda, Peru; *Laticauda rubriginosa*, Balsas, Peru; *Galbula ruficauda brevirostris*, Encontrados, Ven.; *Chelidoptera tenebrosa pallida*, Empalado Savannas, Ven.; *Picumnis venezuelensis*, Encontrados, Ven.; *Phathornis anthropilus fuscicapillus*, Orope, Ven.; *Camptostoma pusillum tenuirostris* Rio Aurare, Ven.; *Empidochanes zuliensis*, Orope, Ven.; *Inezia caudata intermedia*, Rio Aurare, Ven.; *Attila rufipectus confinis*, Orope, Ven.; *Thamnophilus doliatus dearborni*, Encontrados, Ven.; *Dendrocincla tyrannura hellmayri*, Paramo de Tama, Colombia; *Furnarius aquatus venezuelensis*, Rio Aurare, Ven.; *Margarornis perlata peruviana*, Tambo Ventija, Peru; *Microrhoptias grisea fumosa*, Encontrados, Ven.; *Careba luteola obscura*, Encontrados, Ven.; *Diglossa sittoides intermedia*, Cajamarca, Peru; *Synallaxis candei venezuelensis*, Rio Aurare, Ven.; *Atlantes castaneifrons tamae*, Paramo de Tama, Ven. It is unfortunate that in a paper of this kind the species are not arranged in some sort of order either systematic or geographic. Even though it consist of nothing but diagnoses orderly arrangement is an advantage. Ornithologists will await with interest the full report on these interesting collections.— W. S.

Cooke's Distribution and Migration of N. A. Herons.¹— This bulletin follows the plan of other similar reports by Prof. Cooke and presents in concise form the breeding and winter range of each of the thirty-two species of Herons, Ibises etc., found from Panama and the West Indies northward. The migration dates are given for such species as are regularly migrant while maps present graphically the ranges of the various forms. Subspecies are mentioned in most instances as under *Ardea herodias* and *Butorides virescens* where the recent revisions of Oberholser are followed but *Egretta candidissima brewsteri* of Lower California is not recognized, although no reasons are given for such action.

The records quoted through the report are compiled largely from the printed records in ornithological literature and while numerous are by no means complete. In the case of the Great Blue Heron we notice winter records and breeding dates for Pennsylvania and New Jersey published in 'Cassinia' which as well as similar records for other species are omitted. The migration dates are computed solely from the records of the Biological Survey.

This report is a welcome addition to the series being issued by the Department of Agriculture.— W. S.

Trotter on Faunal Divisions in Relation to Vegetation.²— Dr. Trotter discusses in an interesting way the geographic distribution of

¹ Distribution and Migration of North American Herons and their Allies. By Wells W. Cooke. U. S. Dept. of Agriculture, Biological Survey — Bulletin No. 45. Issued May 24, 1913. 8vo, pp. 1-70, figs. 1-21.

² The Faunal Divisions of Eastern North America in Relation to Vegetation. Jour. Acad. Nat. Sci., Phil. XV, pp. 207-217. March 21, 1912.

animal life in eastern North America with regard to its general environment, and makes the claim that while "temperature unquestionably does exert an influence in the distribution of living beings, . . . it is not the supreme cause of the present phase of dispersal." There is much to be said on this subject and Dr. Trotter's views are well worthy of careful consideration. It is fortunately true that by whatever names we call them and whatever rank we give them the larger life areas remain practically the same in all recent discussions. At the same time however we must recognize that there are in Eastern North America certain lines of demarkation in plant life due to causes other than temperature, and the regions thus separated carry with them corresponding differences in their animal life. Furthermore the boundary lines are far more pronounced than those separating certain zones based on purely climatic conditions. Like many another problem there are probably several factors involved, and we must consider each of them, if we are finally to arrive at a proper understanding of conditions as we find them.—W. S.

Thayer and Bangs on Chinese Birds.¹—This paper is a report upon a collection of '3135 beautifully prepared skins representing 358 species and subspecies obtained by Mr. W. R. Zappey in Central China. One new genus, five new species and seven new subspecies are described as follows: *Ithagenes wilsoni*, *Callocalia inopina pellos*, *Heteroxenicus cruralis formaster*, *Tesia grallator*, *Suthora unicolor canaster*, *Suthora zappeyi*, *Præpyga mutica*, *Oreocincla dauma socia*, *Reguloides maculipennis debilis*, *Prinia inornata exter*, *Sylviparus modestus occultus*, *Boanerges* (gen. nov. allied to *Perisoreus*), *internigrans*, all from western Szechwan. Eight additional new forms from this collection were described in a previous paper² and one in a later one.³ Full lists of localities from which specimens are obtained and often brief notes on plumage and habitat are given in the present contribution while there are some comments of a nomenclatorial character. *Hypsipetes* is found to be preoccupied and *Microscelis* is used instead but no further details or references are presented; *Dumeticola* is recognized as distinct from *Tribura*; *Chloris* is used in preference to *Ligurinus*; *Propasser* is not deemed worthy of recognition.—W. S.

Bangs on Some Birds from the Highlands of Siberia.⁴—In this paper Mr. Bangs reports on a collection of 287 bird skins obtained by Messrs. N. Hollister and Conrad Kein who accompanied Dr. Theodore

¹ Some Chinese Vertebrates. Memoirs Mus. Comp. Zool. Vol. XL, No. 4. Aves, By John E. Thayer and Outram Bangs, pp. 137-200. pll. 3-6. August, 1912.

² Bull. Mus. Comp. Zool. 1909, p. 139-141.

³ Proc. Biol. Soc. Wash., XXVI, pp. 95-96. May 3, 1913.

⁴ Some Birds from the Highlands of Siberia. By Outram Bangs, Bull. Mus. Comp. Zool., LIV., pp. 463-474. January, 1913.

Lyman on an expedition to the Altai Mountains of Siberia and Mongolia, and which was presented to the Museum of Comparative Zoölogy.

The list includes 52 species and subspecies of which the following are described as new: *Falco asalon lymani*, *Pinicola enucleator pacata*, and *Perisoreus infaustus opicus*.—W. S.

Thayer and Bangs on a New Race of Great Blue Heron.¹—The specimens upon which this form—*Ardea herodias sancti-luceae*—is based were obtained by Mr. W. W. Brown, Jr. in 1910 from a 'rookery' discovered on Espiritu Santo Island. It is very much like the bird of the Galapagos *A. b. cognata* but much larger. —W. S.

Bangs on New Species of Birds.—Mr. Outram Bangs has recently published descriptions of a number of new birds from various parts of the world. In one paper² are described *Rupornis magnirostris occidua*, eastern Peru; *Penelope perspicax*, western Colombia; *Antrostomus rufus otiosus*, St. Lucia, W. I.; *Thamnophilus doliatus catus*, Margarita Isl., Venezuela; *Pyrocephalus rubinus blatteus*, British Honduras; and *Leistes superciliosus petilus*, Uruguay. As regards the *Pyrocephalus* the reviewer pointed out the difference between the birds of Yucatan and Orizaba in collections made by him, in 1890 but the material in the U. S. National Museum seemed to show that the two forms were not confined to definite geographic areas and were perhaps merely individual variations.

In the collection of Palestine birds made by Selah Merrill and recently acquired by the Museum of Comparative Zoölogy, Mr. Bangs found an undescribed swift³ which he calls *Apus melba petrensis*; while in the Henry Bryant Collection two Song Sparrows taken at Enterprise, Florida in 1859 seem to constitute a distinct resident race which is named *Melospiza melodia beata*.⁴ They have "enormous bills, that cannot be matched in a series of over one hundred skins from points in eastern North America." The culmen measures respectively 14 and 13 mm. while Ridgway's average of 41 specimens of *M. m. melodia* is 12.45 mm. (11.43 to 13.21). From Cuba are described⁵ *Podilymbus podiceps antillarum*, *Limnopardalis maculatus inoptatus*, *Cyanerpes cyaneus ramsdeni* and in the same paper

¹ A New Race of Great Blue Heron from Espiritu Santo Island, Lower California. By John E. Thayer and Outram Bangs. Proc. N. Eng. Zool. Club, IV, pp. 83-84. February 23, 1912.

² Descriptions of New American Birds. By Outram Bangs, Proc. Biol. Soc. Wash. XXIV, pp. 187-190. June 23, 1911.

³ A New Swift from Palestine, By Outram Bangs, Proc. Biol. Soc. Wash., XXIV, pp. 195-196. June 23, 1911.

⁴ The Florida Song Sparrow. By Outram Bangs, Proc. N. Eng. Zool. Club, IV, pp. 85-87, June 5, 1912.

⁵ New Birds from Cuba and the Isle of Pines, By Outram Bangs, Proc. N. Eng. Zool. Club, IV, pp. 89-92, March 31, 1913.

Gymnasio lawrencei exsul and *Agelaius subniger* from the Isle of Pines. *Reguloides pulcher vegetus* is described as new from western Szechwan, central China¹ while the Green Heron of the Maldives² is named *Butorides albidulus*.— W. S.

Zimmer's "Birds of the Thomas County Forest Reserve."³—The region covered by this paper comprises the U. S. Government Forest Reserve in Thomas County, Nebraska, to which Mr. Zimmer and other Nebraska ornithologists have given much attention. There is presented first an ecological classification of the several 'habitats', the sandhills being regarded as Upper Sonoran while the Prairie is Carolinian. The birds characteristic of each region are mentioned, followed by a fully annotated list of 142 species. While the nomenclature follows the A. O. U. List in the main we note that the possessive 's' of all personal names is dropped as is the trinomial from the 'typical' race except where another form of the same species occurs in the area under consideration, — the latter a rather inconsistent practice. This however in no way detracts from the value of the paper which is a well conceived and well presented contribution to the ornithology of an interesting region.— W. S.

California Economic Ornithology.— In Game Bulletin No. 1 (1913) of the California Fish and Game Commissioners, is reprinted Mr. H. C. Bryant's paper on "The present and future status of the California Valley Quail." The bulletin also contains Mr. Bryant's report on his "Investigation of the Economic Status of Non-Game Birds." This article describes the purposes and methods of the investigation, and briefly reports on the economic status of the Western Meadowlark, Blackbirds, and the Lewis's Woodpecker.

Mr. Bryant's final report on "The Economic Value of the Western Meadowlark in California" appears as Bulletin 236 of the State Agricultural Experiment Station. The percentages of animal and vegetable food for the year are reported as approximately 60 and 40. The writer concludes that the balance is certainly in favor of the Meadowlark.— W. L. M.

Four Economic Papers by Professor W. E. Collinge.— The Bullfinch (*Pyrrhula europæa*) has an evil reputation as a destroyer of buds of fruit trees, and Professor Collinge confirms this opinion by the results of examination of the stomachs of 308 of these birds. He finds that "during the five months, January to May, the food consists largely of fruit-buds

¹ A New Warbler from Western China. By Outram Bangs, Proc. Biol. Soc. Wash. XXVI, pp. 95-96. May 3, 1913.

² The Green Heron of the Maldives. By Outram Bangs, Proc. Biol. Soc. Wash., XXVI, pp. 93-94, May 3, 1913.

³ Birds of the Thomas County Forest Reserve. By John T. Zimmer. Proc. Nebraska Ornith. Union, Vol. V, Part 5. April 14, 1913. pp. 51-104.

and fruitlets, and in addition to those which are actually eaten, an equal, or even larger, number are wantonly destroyed by this bird. I have watched it for hours on plum trees destroying the buds wholesale, and similarly on currants."

"My year's record fully confirms the view I had previously held, largely founded upon observations in the field, that the bullfinch is for quite half the year most destructive in fruit orchards, causing considerable losses to growers, which far outweigh any little good it may do in keeping down the spread of weeds. Indeed, its value in this respect is extremely doubtful, for it certainly helps in the distribution of such weeds as the dandelion, dock, groundsel, ragwort, charlock, etc.¹

A report on "The Food of nestling birds,"² gives the results of observations of parents feeding the young and of examination of stomachs of nestlings of the Starling, House Sparrow, Song Thrush and Blackbird. The writer's conclusions as to the nature of the diet and economic value of nestlings agree with those of Judd which he quotes.

The great need of study of the relations of British birds to agriculture is brought out in a paper entitled "The Economic Status of Birds."³ The writer shows that a bird, which by the nature of its food is beneficial, may on becoming abundant come to be regarded as injurious. This case is illustrated by the California Linnet and the Starling. A brief summary of the economic value of British birds, by families concludes the paper.

Professor Collinge's discussion of "The Destruction and Dispersal of Weed Seeds by Wild Birds"⁴ shows that he is in sympathy with the view expressed by Mason in "The Food of Birds in India" which was reviewed in 'the Auk' for July, 1912, pp. 413-416. He says: "We cannot rely on weeds being kept down by birds, and the expense of cultivation to eliminate weeds is, I believe, not reduced in the slightest by the action of birds."

Professor Collinge notes the investigations of Beal, Judd, Kerner, Ridley and Darwin, on the distribution of seeds by birds, and contributes the results of some of his own experiments. 133 weeds of 7 species were grown from 54 droppings of the House Sparrow, 52 plants of 7 species from 38 droppings of the Greenfinch and 96 plants of 9 species from 50 of the Bullfinch. He concludes that seed-eating birds act as distributors of weed seeds to a much larger extent than is generally supposed. Taking this in connection with the evidence regarding the destruction of weeds, Professor Collinge states that he cannot regard seed-eating birds as beneficial.—W. L. M.

Henderson's The Practical Value of Birds.⁵ — This valuable little manual consists of tersely worded chapters on the Balance of Nature,

¹ Journ. Economic Biol. Vol. VII, pt. 2, June, 1912, pp. 50-57.

² Journ. Bd. Agr. Vol. XIX, No. 6, Sept. 1912. Reprint 6 pp.

³ Journ. Land Agent's Society, Oct., 1912. Reprint 5 pp.

⁴ Journ. Bd. Agr. Vol. XX, No. 1, April, 1913. Reprint 12 pp.

⁵ Univ. of Colo. Bulletin Vol. XIII, No. 4, April, 1913, 48 pp.

Rescue of crops, foliage and forests by birds, Quantities of food required by birds, Methods of investigation [of food habits], Necessity of bird protection and Systematic discussion. Under the last heading are given the main facts relating to the various orders and families, with more detailed notes on the most important species. All points made are supported by bibliographic references and the paper closes with a good bibliography. In fact Professor Henderson's publication is a concise and up-to-date compendium of information relating to economic ornithology and will be useful to all who are interested in the subject. — W. L. M.

Recent Educational Publications. — The Massachusetts Audubon Society has issued a third colored bird chart¹ for school and general educational purposes. It includes twenty species of winter birds from paintings by Louis Agassiz Fuertes and is even better than its predecessors. An explanatory pamphlet is by Winthrop Packard and furnishes such information as will be of assistance to teachers and scholars. The Meriden N. H. Bird Club has published a second annual report.² It is attractively printed and illustrated and presents numerous papers on how to attract birds, bird baths, bird enemies, bird boxes etc. The report does credit to the general manager of the Club, Mr. Ernest Harold Baynes.

From Alabama comes an admirable publication³ prepared by Commissioner J. H. Wallace, Jr. of the Department of Game and Fish. It contains a great deal of important information on the value of birds together with poems on birds and nature, attractive illustrations and hints and programs for the conduct of 'bird day.'

California contributes two more numbers of the forceful publication entitled 'The Western Wild Life Call'⁴ devoted respectively to the bill to prohibit the sale of wild game and that providing protection to the Dove, Band-tailed Pigeon, Shore-birds, Ducks, etc. The clear presentation of the need of action, by leading authorities, and the complete list of the state legislature with a call for every citizen to write to his representatives, form an admirable campaign document that could well be followed by other states in advocating similar legislation. — W. S.

¹ Twenty Winter Birds. By Winthrop Packard to Accompany Audubon Bird Chart No. 3. Published for the Massachusetts Audubon Society, By Milton Bradley Company, Springfield, Mass. 1913. Chart and pamphlet \$1.50.

² Second Report of The Meriden Bird Club, 1912. Boston, Mass. Svo., pp. 1-82. With halftone illustrations and maps. One dollar, address Secretary of The Meriden Bird Club, Meriden, N. H.

³ Alabama Bird Day Book, 1913. Issued by the Department of Game and Fish. John H. Wallace Jr. Commissioner, pp. 1-84 colored plates from 'Birds and Nature' and original halftones.

⁴ Western Wild Life Call. Nos. 2 and 3. March 14 and 29. 1913. Published by the California Associated Societies for the Conservation of Wild Life.

The Ornithological Journals.

Bird-Lore.¹ Vol. XV. No. 2. March-April, 1913.

This number is devoted almost entirely to the Passenger Pigeon, with illustrations from photographs of live birds taken by J. G. Hubbard, in Dr. C. O. Whitman's aviary, in 1898.

A Vanished Race. By Moritz Fischer.

The Passenger Pigeon: Early Historical Records. By A. H. Wright.

Recollections of the Passenger Pigeon in Captivity. By Wallace Craig.

The Last Passenger Pigeon. By E. H. Forbush.

Migration of N. A. Sparrows. By W. W. Cooke—Fox Sparrow. Plumage notes by F. M. Chapman.

Two Educational Leaflets treat of The Emperor Goose, By E. W. Nelson, and The Crested Auklet, By C. H. Townsend.

Bird-Lore. Vol. XV. No. 3. May-June. 1913.

A Bird Apartment House. By Albert Morgan.—Sparrow Hawk, Bluebird and Flicker nesting in the same tree trunk.

A Purple Martin Colony. By W. M. Tyler.—At Salisbury, N. H. Barn Swallows in Springtime. By J. W. Lippincott.—A good study of habits.

The Gray Kingbird at Home. By Henry Thurston.—At Tampa Bay, Fla.

A Pet Blue Jay. By Mrs. H. E. Merrill.

The Migration of N. A. Sparrows. By W. W. Cooke with Notes on the Plumage by W. DeW. Miller.—Treats of Pyrrhuloxia and Cardinal.

The Green Heron, by T. Gilbert Pearson and The Alaska Longspur By E. W. Nelson, are the Educational Leaflets of this number.

The Condor.² Vol. XV. No. 2. March—April, 1913.

Largely a prospectus of Dawson's proposed 'Birds of California.'

The Nesting of the Prairie Falcon in San Luis Obispo County. By W. L. Dawson.

William Leon Dawson — A Biography. By H. S. Swarth.

Allan Brooks — An Appreciation. By W. L. Dawson.

Leucosticte tephrocotis dawsoni.—A New Race of the Rosy Finch from the Sierra Nevada. By Joseph Grinnell.

Great Destruction of Birds' Eggs and Nestlings in the Sierra Nevada. By A. M. Ingersoll.

Birds Observed in the Summer of 1912 among the Santa Barbara Islands. By Howard Wright and G. K. Snyder.

The Wilson Bulletin.³ Vol. XXV. No. 1. March, 1913.

¹ Organ of the Audubon Societies. Edited by F. M. Chapman. Published by D. Appleton & Co. Harrisburg, Pa.

² Edited for the Cooper Ornithological Club, by Joseph Grinnell. Published at The Condor Office, Hollywood, California.

³ Edited for the Wilson Ornithological Club, by Lynds Jones, Oberlin, Ohio.

Variations in Bird Migration from Year to Year. By W. W. Cooke — Prof. Cooke maintains “that the departure from the winter home has no connection with the weather, and that the *average* temperature at the *breeding grounds* is the principal factor that determines the time and speed of migration” and that “local variations in temperature should have only a slight influence in varying the dates of arrival from year to year.” We think that in this he is probably correct but we cannot concede the degree of accuracy that he claims for various calculations based upon *individual first arrival* records. The causes of variation and inaccuracy in these are numerous and in any effort to ‘correct’ them the personal equation enters unconsciously. We believe, as elsewhere, stated that for accurate comparative studies the *combination* of a large number of records by different observers from one vicinity is an absolute necessity. Until such material is at hand much of the detailed calculation is futile.

Autumn Birds in Alcona County, Michigan. By J. Claire Wood. An interesting contribution to a little known section of the state. We trust that Mr. Wood will be able to add a supplementary report on the summer birds.

The Nest of the Goldfinch based on Study of the Deserted Nests. By Francis M. Root. Only two out of eleven showed any thistle down in the lining!

A Critique of Barrows' “Michigan Bird Life.” By B. H. Swales.—Thirteen species are listed of which there seems to be no positive record of their occurrence in Michigan.

Notes on the Breeding Habits of *Agelaius phoeniceus*. By W. L. Hackett.

Corrections to a Preliminary List of the Summer Birds of Fall River County, Southwestern South Dakota. By S. S. Visser.

The Oölogist.¹ Vol. XXX. No. 3. March 15, 1913.

The Nesting History of a Pair of Golden Eagles. By C. S. Sharpe. Excellent illustrations from photographs.

Nesting of the Prairie Horned Lark in Southern [i. e. south-western] Pennsylvania. By S. S. Dickey.

The Ibis.² X Series. Vol. I, No. 2. April, 1913.

The Birds of Hong Kong, Macao, and the West River or Si Kiang in South-eastern China, with special reference to their Nidification and Seasonal Movements. Part II. By R. E. Vaughan and K. H. Jones.—This installment includes 79 species and is accompanied by a colored plate of eggs. Among many interesting notes we read that *Halcyon smyrnensis* and *H. pileatus* are much sought by the Chinese “who use their blue feathers for the manufacture of the well-known ‘Kingfisher enamel,’ which has been in use in China since the time of Confucius.” *Palæornis torquata*

¹ Edited and published by R. M. Barnes, Lacon, Ill.

² Edited for the British Ornithologists' Union, by W. L. Sclater. Published by R. H. Porter, 7 Princes St., Cavendish Sq. W., London.

said to have been accidentally introduced is now well established at Hong Kong.

A Reference List of the Birds of New Zealand. Part I. By Gregory M. Mathews, and Tom Iredale—This is a thorough revision of New Zealand birds with the nomenclature brought into conformity with the International Code, and with the extreme generic subdivision which the authors favor. Numerous notes and explanations, and the more important synonyms are given under each species. We note as new forms: *Hydroprogne tschegrava oliveri*, *Sterna vittata bollonsi*, and *Sternula nereis davisæ*, while many other forms here recognized have been described by Mr. Mathews in recent numbers of his 'Birds of Australia' etc. The types of all the genera are definitely cited following the method of the third edition of the A. O. U. Check List. *Podiceps* we note is used for the Grebes on the claim that Gray's selection of *C. arcticus* Linn. as the type of *Colymbus* Linn. 1735 *nec* 1766 fixes the latter genus on the Loons. So far as we can see Mr. Mathews argument is sound and it is surprising that Gray's change of type in the 1855 edition of his 'List of Genera' should have been entirely overlooked.

Further Notes on the Birds of China. By J. D. D. La Touche.—Consists of additions to the list of Birds of Chinkiang and additional observations on the birds of Fohkien. Two specimens of the so-called *Junco siemsseni* Martens, previously known from the unique type, were obtained at Kuantun, north-west Fohkien, and the female is described for the first time.

Some Notes and Observations on a Guan (*Ortalis vetula*), suggested by an Examination of an Immature specimen. By Percy R. Lowe.—This is a very suggestive paper in which the theory is advanced that the Guans represent a type of gallinaceous bird in which the change from an arboreal to a terrestrial life has never been successfully completed. The young are shown to be remarkably well developed when hatched and are in most respects like young of terrestrial gallinacæ, though certain characters indicate a comparatively recent arboreal life which the adults still follow. Mr. Lowe presents good arguments against the possibility of this being a 'reversion' or return to the arboreal life.

On *Sterna hirundo* Linn. and on the Name of the Common Tern. By Einar Lönnberg—Decides that Linnæus referred to the Common Tern and not the Arctic as has been suggested.

Obituary notices of Dr. Edward A. Wilson who perished on Capt. Scott's Antarctic Expedition and Dr. Robert Collett. The former, by the way, was a great nephew of Dr. Thos. B. Wilson at one time president of the Academy of Natural Sciences of Philadelphia well known as a benefactor of that institution and an associate of John Cassin.

Under 'Letters etc.' there is a strong reply to Dr. Sclater's criticism of the new British Hand List by its authors.

Bulletin of the British Ornithologists' Club.¹ No. CLXXXV.

¹ Edited by W. R. Ogilvie Grant. Published by Witherby & Co., 326 High Holborn, London.

List of Melanistic, Albinistic and Hybrid birds exhibited by Hon. W. Rothschild.

The following new forms are described: *Turdus swynnertoni* Bannerman, Rhodesia; *Cypselus pacificus cooki* Harrington, Northern Shan States; *Acrocephalus taiti*, *Vini hendersoni* and *Porzana murrayi* described by Ogilvie-Grant from Henderson Island, South Pacific, with remarks on other birds of this little known island. Later, in No. CLXXXVII of the Bulletin it is pointed out that Mr. A. J. North had published a paper on Henderson Island birds in which two of these supposed new forms were named. *Vini hendersoni* = *V. stepheni* North and *Porzana murrayi* = *P. atra* North.

Bulletin of the British Ornithologists' Club. No. CLXXXVI.

New forms described: *Ptilotis ornata wesleydalei* Mathews, southwest Australia; *P. o. underbooli* Mathews Victoria; *Larus fuscus antelius* Iredale, Obi River.

Bulletin of the British Ornithologists' Club. No. CLXXXVII.

New forms: *Emberiza yessoënsis continentalis* Witherby, near Nanking, China; *Sitta europaea hispaniensis* Witherby, Spain and Portugal.

British Birds.¹ Vol. VI. No. 10. March 1, 1913.

Edward Adrian Wilson. An Appreciation. By W. S. Bruce.

Professor Robert Collett. By A. H. Cocks.

Increase and Decrease in Summer Residents 1912.—Compilation of Reports.

British Birds. Vol. VI. No. 11. April 1, 1913.

Henry John Pearson. A Memoir. By H. W. Feilden.

Notes on Mortality in Nestling Cuckoos. By J. H. Owen—Of 34 young Cuckoos observed in the nest during 1911 and 1912, seventeen came to an untimely end. The ratio, 50 percent, was exactly the same in each year.

Note on the Ejection of the Lining Membrane of the Gizzard by the Curlew. By H. Hammond Smith.—Other birds which possess the same habit are mentioned.

Are Starlings Double or Single Brooded? By N. F. Ticehurst — Some at least were proved to have two broods, by banding and recapture.

British Birds. Vol. VI. No. 12. May 1, 1913.

Early "Drumming" of the Snipe and its Significance. By H. Lynes.—Considers it due to earlier revival of sexual instincts on account of mild winter.

The Lesser Black-backed Gull of the British Isles. By Tom Iredale—An examination of the type of *Larus affinis* Reinhardt shows that it is the same as the recently described *L. fuscus britannicus* Lowe (cf. Bull. B. O. C. CLXXXVI.)

"British Diving Ducks." A review of J. G. Millais' recent work by

¹ Edited by H. F. Witherby. Published by Witherby & Co., 326 High Holborn, London.

H. F. Witherby — The reviewer strongly refutes the author's claim of color change in feathers, citing Dr. Strong's papers with which Mr. Millais seems to have been unacquainted. Other points are also discussed at length and the review is really one of the leading papers in the number.

The Avicultural Magazine.¹ Vol. IV. No. 5. March, 1913.

The Sexes of *Liothrix lutea* with Remarks on Modifications of the Species. By A. G. Butler — colored plate.

The Tameness of Wild Geese. By I. Dorrien-Smith — On the Scilly Isles.

My Antarctic Goose, *Cloëphaga antarctica*. By F. E. Blaauw.

The Hooded Parrakeet, *Psephotus dissimilis* (Collett). By G. M. Mathews. — A history of its nomenclature. *P. cucullatus* North and *P. chrysopterygius blaauwi* Van Oort are both synonyms (see also Bull. Brit. Orn. Club, CLXXXV).

The Avicultural Magazine. Vol. IV. No. 6. April, 1913.

The Gardener Bower Bird. *Amblyornis inornata*. By H. D. Astley.

In Praise of Owls. By Miss E. F. Chawner — As aviary birds.

The Avicultural Magazine. Vol. IV. No. 7. May, 1913.

The Blue Niltava. *Xanthopygia cyanomelana*. By H. D. Astley — Colored plate.

On Birds and their Surroundings between Puerto Varas and Puerto Montt. By F. E. Blaauw — Interesting account of a trip to Chile, illustrated.

The Pied Chat *Saxicola leucomelana*. By H. D. Astley. — Plate in black and white.

The Endurance of Young Wild Ducks. By I. Dorrien-Smith — Notes on birds on the Scilly Isles.

Notes on the Mild Winter and the Birds. By P. F. M. Galloway — Vegetation in England practically five weeks in advance and birds in song and nesting much earlier than usual.

Bird Notes.² Vol. IV. No. 3. March, 1913.

Birds of the Sal Forest. By D. Dewar. — Pilibhit district of India.

Fairy Blue Birds. By W. T. Page. — Review of species and distribution.

Birds of Gambia. By E. Hopkinson (continued).

The Emu.³ Vol. XII. No. 4. April, 1913.

On the Comparative Osteology of *Cereopsis novæ-hollandiæ*. By R. W. Shufeldt. — A vast amount of detail is presented but the results of the author's studies are exactly those given in the classification of Evans

¹ Edited for the Avicultural Society, by Hubert D. Astley. Published by West, Newman & Co., 54 Hatton Garden, E. C., London.

² Journal of the Foreign Bird Club. Edited by Wesley T. Page, Treasurer. Sydney Williams, Holland Lodge, Edmonton, London, N. England.

³ Organ of the Royal Australasian Ornithologists' Union. Edited by A. J. Campbell and Charles Barrett, Melbourne Australia. London Agents, Witherby and Co., 326 High Holborn.

&c. except that he separates the Tree-ducks in a separate subfamily, the reasons for which are to be presented in another paper.

Ornithological Notes, Barclay Expedition. By G. F. Hill.— A valuable annotated list.

Field Ornithology in South Australia. By S. A. White.

Report on Mutton-Bird Rookeries, Cape Wollomai. By A. J. and A. G. Campbell.— 884 occupied and 1416 unoccupied burrows.

Notes on a Small Collection of Bird Skins from the Northern Territory. By A. J. Campbell and J. A. Kershaw.

The Austral Avian Record.¹ Vol. I. No. 8. March 20, 1913.

New Subspecies of Birds from the Monte Bello Islands, N. West Australia. By P. D. Montague. *Eremiornis carteri assimilis* and *Anthus australis montebelli*.

Additional Species Described by Gould from Norfolk, Lord Howe and Philip Islands. By Witmer Stone and Gregory M. Mathews.

The Genus-Name *Meliphaga*. By G. M. Mathews.— Replaces *Ptilotis* Sw.

Additions and Corrections to my Reference List. By G. M. Mathews.— Twenty-six new forms, with type specimens designated.

New Genera. By G. M. Mathews.— Ten new.

Journal of the South African Ornithologists' Union.² Vol. VIII, No. 2. December, 1912.

Random Notes on South African Ornithology. By C. G. Davies.— Important note on habits of the Finfoot (*Podica petersi*).

The South African Lanner Falcon (*Falco biarmicus*) and its Congeners. By B. C. R. Langford.

The Wild Birds of the Pretoria Zoological Gardens. By Alwin Haagner.

The Value of Birds to Man. By James Buckland.

Ardea. (In Dutch.) Vol. II. No. 1. March, 1913.

On the Arrival of Certain Migrant Birds in Holland in 1912. By H. Ekama.

Ornithological and Oological Miscellany. By A. A. Van Pelt Lechner.

Results of Bird Banding at the Leiden Museum. By E. D. Van Oort.

Swan and Geese at Gooilust, Graveland. By F. E. Blaauw.

Ornithological Observations in Holland. By E. D. Van Oort.

Revue Francaise d'Ornithologie.³ (In French.) Year V, No. 47. March, 1913.

Birds Collected in South-west Morocco, on the Madam Du Gast Expedition. By A. Menegaux.

Observations on Quail Banded and Released at Fayet on 1912. By F. Hugues.

¹ Edited by Gregory M. Mathews. Published by Witherby & Co.

² Editors, Dr. J. W. B. Gunning, B. C. R. Langford and A. K. Haagner, Pretoria, Transvaal. London Agents, Witherby & Co., 326 High Holborn.

³ Edited by A. Menegaux, 55, Rue de Buffon, Paris.

Revue Francaise d'Ornithologie. Year V. No. 48.

Descriptions of two New Birds of Paradise. By A. Menegaux.—*Paradisæa duivenbodei*, Yaour, Geelvink Bay, New Guinea; *P. raggiana sororia*, New Guinea.

Revue Francaise d'Ornithologie. Year V. No. 49.

On the Classification of Birds. By A. Dubois.

On *Houbara undulata* (Bp.). By A. Vaucher, with plate.

Abnormal Eggs. By A. Legros.

Journal für Ornithologie.¹ (In German.) April, 1913.

The Klein Bird Drawings (*continued*). By J. Gengler.

The Significance of Egg-Shell Structure for the Systematist. By A. Szielask.

Revision of the Genus *Cercomela*. By O. Neumann and O. Graf Zedlitz — *C. melanura erlangeri* subsp. nov., Khareba, S. Arabia; *C. scotocerca enigma* subsp. nov., Dire Dana, N. Somaliland.

How has the Appearance of the Landscape of West Prussia been Affected by the Operations of Man and How have the Habits of Birds been Influenced thereby? By F. Braun.

On the Banding of Rough-leg Hawks in Swedish Lapland in the summer of 1911. By L. A. Jägerskiöld.

Studies of Bird Song. By C. Schmitt and H. Stadler — Extensive Use of musical notation.

Ornithologische Monatsberichte.² (In German.) March, 1913.

A few Remarks on the Ostrich Egg-shell Fragments from the Algerian Sahara. By H. Schalow.

Supplement to a Notice of Wild Ring Doves in Eutin. By R. Biedermann-Imhoof.

Rossitten Migration Notes. By J. Thienemann.— Also in the May number.

Titmice as Resident Birds. By H. Grote.

An Important Bibliographic Discovery. By F. Lindner.— A nearly complete copy of the first edition of Naumen's Ornithological Works.

Ornithologische Monatsberichte. April, 1913.

New Forms of Francolin from Persia. By N. Sarudny and M. Härms.— *Francolinus (Ortygornis) pondicerianus mecranensis* Valley of Rud-i-Sarbas River, Persian Beluchistan; *Francolinus orientalis arabistanicus*.

New African Birds. By O. Graf Zedlitz — *Eurocephalus anguitemens erlangeri*, Abyssinia; *E. a. deckeni*, S. Somaliland; *E. a. fischeri*, Udjiri-Sümpfe; *E. a. böhmi*, Langenburg; *Indicator exilis erlangeri*, Afgoi; *Francolinus sephæna jubaensis*, Afgoi; *Turtur decipiens elegans*, Afgoi; *Turtur capicola hilgerti*, Aurowin.

Tolanus ochropus a winter visitant in Thuringia. By R. Fenk.

An Ornithological Rescript of the year 1751. By H. Schalow.

¹ Edited by Dr. A. Reichenow. L. A. Kittler, Leipzig, Agent.

² Edited by Dr. A. Reichenow. R. Friedländer & Sohn, Berlin, N. W. 6, Karlstr. 11. Agents.

Ornithologische Monatsberichte. May, 1913.

Some Observations on the Frohburg-Eschefeld Pond in the early part of 1912. By R. Zimmermann.

Does *Pocile atricapillus borealis* really winter in Finland. By H. Baron Loudon.

On *Francolinus granti* and *kirki*. By H. Grote.

On the Swimming of the Water Ouzel. By Tschusi zu Schmidhoffen.

On the Cessation of Song in Birds During a Solar Eclipse. By R. Biedermann-Imhoof.

Ornithologische Monatschrift.¹ (In German.) Vol. XXXVIII. No. 1. January, 1913.

Reports on Birds Breeding on the Memmert Bird Colony in 1912 by O. Leege; on the Colonies at Jordsand, Ellenbogen, Norderoog, Langenwerder and Poel by F. Dietrich; and on the Werder Islands by P. Gottschalk.—These are well illustrated and interesting to all workers for the conservation of wild bird life.

Observations on the Long-tailed Titmice during the Early Part of 1911 in Leboch Park. By K. Loos.

Notice and Bibliography of Prof. W. Blasius. By E. Blasius.

Ornithologische Monatschrift. Vol. XXXVIII. No. 2. February, 1913. Annual Report of the Society for the Protection of Birds.

Ornithologische Monatschrift. Vol. XXXVIII. No. 3. March, 1913. Articles on Manual training in schools in connection with bird protection—building bird boxes etc.

General Bird Observation in Ireland and England in July, 1911 (continued in April number).

Ornithologische Monatschrift. Vol. XXXVIII. No. 4. April, 1913. Arrival and Departure Dates at Hallein [Austria] in 1912. By Tschusi zu Schmedhoffen.

On *Pratincola rubicola*. By K. Regel. Illustrated.

Proceedings of the Bavarian Ornithological Society.² (In German.) Vol. XI, No. 3. April, 1913.

The German "Gerlitz" and its Relationship to the Geographic Forms of the Genus *Serinus*. By A. Laubmann.—*Serinus canarius germanicus* subsp. nov.

A contribution to the Ornithology of the Bavarian Forest. By J. Gengler.

The Migration of Siberian Nutcrackers into Bavaria in 1911. By A. Laubmann.

On the Imitating of Middle European Birds. By H. S. and C. Schmitt.

The Appearance of the Nightingale (*Luscinia megarhynchos megarhynchos*) in the Palatinate. By K. Bertram.

¹ Organ of the German Society for Protection of Birds. Edited by Dr. C. R. Henniecke and Dr. O. Taschenberg, Agent, Max Kretschmann Creutzschen Verlagsbuchhandlung in Magdeburg, Germany.

² Edited by C. E. Hellmayr, Munich. Gustav Fischer, Jena, Agent.

On a New Tanager from Trinidad. By C. E. Hellmayr and Josef Graf von Seilern.—*Sporathraupis cyanocephala büsingi*, Mount Aripo, Trinidad.

Ornithologisches Jahrbuch.¹ (In German.) Vol. XXIV. Nos. 1–2. January–April, 1913.

Breeding Birds of the Vicinity of Gmunden and Lambach [Austria]. By A. Watzinger.

Journal Notes on the Oder Delta country and Lower Pomerania. By R. J. Fromhelz.

A Contribution to the Ornithology of the Arber Country [Germany].

On the Appearance of Rock Sparrows (*Petronia*) in Würthtemberg. By W. Bacmeister.

Message Ornithologique.² (In Russian.) Vol. IV. No. 1. 1913.

Preliminary List of the Birds of the Tarsk District, Tobolsk, [Russia]. By W. E. Uschakow.

On Some Birds of the Kjelzer Government [Russia]. By E. I. Katin.

Acrocephalus streperus intermedius subsp. nov. By W. W. Stantschinski.

Corvus macrorhynchus mandshuricus subsp. nov. By S. A. Buturlin.

A New Geographic Form of Sparrow, *Passer montanus volgensis*. By S. I. Ogniew.

New Forms of *Remiza*. By N. A. Sarudny — *Remiza pendulina bostanjogli*, *R. p. menzbieri*.

Names of the *Parus cinereus* Group. By S. A. Buturlin.—Recognizes four races besides the typical one; *bokharensis* Licht., *turcestanicus* Sarud. and Loud., *ferghanensis* Brit., and *dzungaricus* Sarud. and Bilkew.

An Ornithological Excursion to Sarsoan-nor and Marka-Kul Lakes, W. Siberia in 1909 (continued in this and the next number). By G. I. Poljakow.

Message Ornithologique. Vol. IV. No. 2. 1913.

On the Ornithology of the North-eastern Sayan Mountains. By A. J. Tugarinow.

On Various Hybrids between the Yellow-hammer and White-headed Finch. (*Emberiza citrinella erythrogegens* and *E. leucocephalos*). By N. A. Sarudny.

The Chinese Swan (*Cygnus davidi* Swinh.) in Siberia. By W. Dorogostaisky.

The Question of the Systematic Position of the White-winged Magpie (*Pica leucoptera*). By S. I. Ogniew.

Notes on the Distribution of *Penthestes* (= *Poecile*). By S. A. Buturlin. *Cyanistes cyanus yenisseeensis* But. et Tugar. in Kiev. By S. A. Buturlin.

A New Form of Dove (*Columba ænas hyrcana* subsp. nov.). By N. A. Sarudny and S. I. Bilkewitsch.

¹ Edited by Victor Ritter von Tschusi zu Schmidhoffen Hallein, Salzburg, Austria.

² Edited by G. I. Poljakow, Gut. "Sawino," Oberalowka, Moscow Govt., Russia.

- Aquila.**¹ (In Hungarian and German.) XIX Volume. 1912.
A Sketch of the Status of 'Ornithophainology.' By Otto Herman—
A review of recent works on bird migration.
The White Stork in South Africa. By Alwin Haagner and others.
Numerous papers on bird migration in Hungary.
The Vegetable and Insect Food of *Perdix perdix*. By L. Thaisz and E. Csiki.
Microscopic Anatomy of the Lower Intestine of Birds. By E. Greschik—
Numerous species examined and full bibliography.
Fossil Birds of Hungary. By K. Lambrecht.
Bird Banding by the Hungarian Ornithologists' Union in 1912. By J. Schenk.
Bird Protection in Hungary, 1912. A number of Reports.
Rivista Italiana di Ornitologia.² (In Italian). Vol. II. No. 2. October–December, 1912.
Hybridism in the Production of a Systematic Species. By Alex. Ghigi.—Deals with Pheasants.
Singular Capture of an Eastern Species of *Ardetta* [in Italy]. By T. Salvadori—*A. eurythma* Swinh. new to Italy and to Europe.
Sula bassana on the Island of Elba and its Distribution in Italy. By G. Damiani.
Catalogue of a Small Collection of Birds from the Colony of Eretria [N. E. Africa]. By F. Cavazza.
The Jay of Sardinia. By T. Salvadori and E. Festa.

Ornithological Articles in Other Journals.³

- Rintoul, Leonora J., and Baxter, Evelyn, V.** Bird Notes from the Isle of May. Spring and Autumn, 1912. (The Scottish Naturalist, March, 1913.)
Clarke, Wm. Eagle. The Song-Thrush of the Outer Hebrides—*Turdus musicus hebridensis*—A New Racial Form. (The Scottish Naturalist, March, 1913.)—Types from Island of Barra.
Andersion, Peter, The Birds of the Island of Tiree. (The Scottish Naturalist, April, 1913.)
Thomson, A. L. Aberdeen University Bird-Migration Inquiry: First Interim Report (1909–12) (The Scottish Naturalist, April, 1913.)

¹ Edited by Otto Herman for the Royal Hungarian Central Bureau for Ornithology: Budapest, Hungary.

² Edited by Ettore Arrigoni Degli Oddi. Published by Stabimento, Poligrafico Emiliano, Piazza Calderini, 6, Bologna, Italy.

³ These titles represent papers which have not been sent to 'The Auk' for review but have been received in the library of the Academy of Natural Sciences. The editor is indebted to Mr. J. A. G. Rehn for keeping a memorandum of the titles from month to month and to Dr. Edward J. Nolan, librarian of the Academy for the privilege of examining them. Full reviews are given only when the papers are sent to 'The Auk'.—W. S.

Ramsay, L. N. G. On the Moulting of the Herring Gull (*Larus argentatus*) and Other Species (The Scottish Naturalist, May, 1913).— In the bibliography or moult we notice the omission of a number of papers notably Dr. Dwight's 'Sequence of Plumage and Moults of the Passerine Birds of New York' (Ann. N. Y. Acad. Sci., 1900) — probably the most extensive contribution to the subject of moult that has yet appeared.

Selous, E. A Diary of Ornithological Observation Made in Iceland during June and July, 1912. (The Zoölogist, March 15, 1913) (continued in the April number).

Ingram, Collingwood. Description of a New Form of Long-tailed Tit. (*Egithalus caudatus taiti*, Coïmbra, Portugal (The Zoölogist, April 15, 1913).

Stubbs, F. J. Asiatic [and other] Birds in Leadenhall Market (The Zoölogist, April 15, 1913) — An interesting commentary on the cold storage trade.

Gurney, J. H. Ornithological Report for Norfolk (1912) (The Zoölogist, May 15, 1913).

Patten, C. J. The Diurnal Migration of Certain Birds Observed at the Tuskar Rock [Ireland] (The Zoölogist, May 15, 1913.) — A valuable contribution to the study of migration at lighthouses.

North, A. J. On the Early History of the Australian Cassowary (*Casuarius australis* Wall.). (Records of the Australian Museum, Vol. X, No. 4. April, 1913) — An interesting historical compilation.

Foyer, J. C. F. [*Artamus fuscus* feeding on butterflies in Ceylon preferring 'distasteful' species] (Abst. Proc. Zool. Soc. London, No. 121. May 6, 1913).

Bragg, L. M. American Scoter and Ring-necked Duck [in S. Carolina] (Bull. Charleston Museum, February, 1913.)

Bryant, C. A. The Passenger Pigeon (Forest and Stream, April 19, 1913).— Personal Recollection of the bird in Michigan.

Crandall, L. S. Wild Duck Farming a New Industry. (Out-door World and Recreation, April, 1913) — Excellent illustrations.

Shaw, W. T. A Bird that Butcher's (Out-door World and Recreation, June, 1913) — Photographs of a Shrike and its impaled prey.

Loring, J. A. Making Friends with Nature (Out-door World and Recreation, May, 1913) Intimate photographs of Chickadees, etc.

Timpel, Max. The Birds of Erfurt and Vicinity. (Jahrb. Königl. Akad. Gemeinnütziger Wissench. zu Erfurt. XXXVIII, 1912, pp. 1-98.) — List of 210 species with full discussion of nesting, migration, economic value etc.

Sassi, M. A New Species of the Genus *Cercococcyx*. *C. olivinus* nov. sp. (Ann. K. K. Naturhist Hofmus. Wien. 1912. XXVI, pp. 341-342.) — From the Rutschuru Valley.

Sassi, M. A Contribution to the Ornithology of Central Africa (Ann. K. K. Naturhist Hofmus. Wien, 1912, XXVI, pp. 347-393). Report on the birds collected on R. Grauer's expedition, December, 1909-February,

1911, through central Africa, Lakes Tanganika, Kivu, Albert Edward and into the Congo forest.

This installment covers all the groups but the Passeres and 193 species are listed. *Columba albinucha* from Moëra, and *Asio abessinicus graueri* from west of Lake Tanganika are described as new and the former figured.

O'Donoghue, Chas. H. A Table for Use in the Identification of Birds' Skulls. (Zool. Anzeiger XLI, pp. 465-468. 1913.)—'Identification' carried only to palate-structure 'desmognathous' etc.

Blaauw, F. E. Across South America to Tierra del Fuego and back through the Smith-Channel (Notes from the Leyden Museum, XXXV, No. 1, December, 1912.)—Interesting comment in birds, and plate of young *Coscoroba*.

Van Oort, E. D. Report on Birds from the Netherlands. Received from September, 1911 till September 1, 1912. (Notes from the Leyden Museum XXXIV, No. 3-4, pp. 231-234).

Van Oort, E. D. Bird-Marking in the Netherlands. Recovery of Marked Birds (Notes from the Leyden Museum XXXIV, No. 3-4, November, 1912, pp. 243-256).

Roberts, Austin. The Grass Warblers of South Africa (*Cisticola, Hemipteryx*.) (Ann. Transvaal Mus., III, Part 4, pp. 227-266.)—*Cisticola aberrans minor* subsp. nov. Port St. Johns dist.; *C. monticola* sp. nov. Pretoria; *Hemipteryx major*, sp. nov. Grahamstown; *H. egregia* sp. nov. Wakkerstroom.

Hartert, E. Expedition to the Central Western Sahara: Birds (Novitat. Zool. XX., No. 1, February, 1913. pp. 37-76.) Annotated list of species or subspecies, *Ænanthe leucopyga ægra* subsp. nov. Gara Khina. Also an interesting chapter on migration in which the author rejects the theory of narrow paths crossing the Mediterranean at definite points and also the guidance of birds by landmarks.

Zedlitz, O. Graf. Ornithological Results of the Expedition of Paul Spatz in the Algerian Sahara in the Summer of 1912 (Novitat. Zool. XX, No. 1, February, 1913, pp. 164-186).—Annotated list of 65 species.

Hellmayr, C. E. Critical Notes on the Types of Little-known Species of Neotropical Birds. Part II. (Novitat. Zool. XX, No. 1, February, 1913, pp. 227-256). Numerous important cases of synonymy etc. demonstrated.

Magnan, M. A. (1) The Weight of the Remiges of birds (2) Geometrical Investigations on the Superior Members of Birds (Bull. Mus. Nat. d'Hist. Nat., Paris, 1912, pp. 13-15). (3) The Weight of the Rectrices of Carinate Birds. (*Ibid.*, pp. 182-184.) (4) The Weight of the Contour Feathers and Down of Birds (*Ibid.*, pp. 385-389). (5) The Quantity of Blood in the Different Groups of Birds (*Ibid.*, pp. 389-391). (6) Relation between the Power of Flight and Development of the Lungs in Birds. (*Ibid.*, pp. 483-485). (7) The Weight of the Liver in Birds after Bleeding. (*Ibid.*, pp. 485-488).

Chigi, Francisco. Catalogue of a Collection of Birds from the Vicinity of Rome (Bollett. Soc. Zool. Ital. (III) I, pp. 417-443. October, 1912).

Dabbene, Roberto. Contribution to the Ornithology of Paraguay. Notes on the Birds Collected in Villa Rica by Felix Posner. (Anales Mus. Nac. Hist. Nat. Buenos Aires, XXIII, pp. 383-390, 1912) — Annotated list of 86 species with full synonymy and a bibliography.

Nelson, E. W. A New Subspecies of Nun Bird from Panama (Proc. Biol. Soc. Washington, XXVI, pp. 67-68, March 22, 1913). *Monasa pallescens minor*. Marraganti, Panama.

Cooke, W. W. Bird Migration in the District of Columbia (Proc. Biol. Soc. Washington, XXVI, pp. 21-25. Feb. 8, 1913).

A table showing average and earliest dates of arrival and departure (in spring) of 107 species and a list of 41 resident species.

Publications Received.—**Bangs,** Outram (1) Some Birds from the Highlands of Siberia. (Bull. Mus. Comp. Zool., Vol. LIV. No. 16. Jan., 1913, pp. 463-474.) (2) A New Race of Great Blue Heron from Espiritu Santo Island, Lower California. (Proc. N. E. Zool. Club, Vol. IV., pp. 83-84, 1912.) (3) The Florida Song Sparrow. (*Ibid.*, pp. 85-87.) (4) New Birds from Cuba and the Isle of Pines. (*Ibid.*, pp. 89-92.) (5) Descriptions of New American Birds. (Proc. Biol. Soc. Washington, Vol. XXIV, 1911, pp. 187-190.) (6) A New Swift from Palestine. (*Ibid.*, pp. 195-196.) (7) The Green Heron of the Maldives. (*Ibid.*, pp. 93-94.) (8) A New Warbler from Western China. (*Ibid.*, pp. 95-96.)

Chapman, F. M. Color Key to North American Birds. With Bibliographical Appendix. Revised Edition. New York, D. Appleton & Co. 1912. Svo. Cloth \$2.50 net. Postpaid, \$2.74.

Cooke, Wells W. Distribution and Migration of North American Herons and their Allies. (Bulletin 45, Biol. Survey, U. S. Dept. Agric. May 24, 1913.)

Cory, Charles B. Description of Twenty-eight New Species and Subspecies of Neotropical Birds. (Publ. 167. Field Mus. Nat. Hist., Ornith. Series Vol. I. No. 7, pp. 283-292, May 31, 1913).

Henderson, Junius. The Practical Value of Birds. (Univ. of Colorado, Bull. Vol. XIII. No. 4, April, 1913.)

Hornaday, William. T. Our Vanishing Wild Life, its Extermination and Preservation. New York Zoological Society, 1913. Svo. Charles Scribner's Sons. Price, \$1.50.

Mathews, Gregory M. The Birds of Australia. Vol. II, No. 5; Vol. III, Nos. 1 and 2.

Packard, Winthrop. Twenty Winter Birds and Chart No. 3. Published for the Mass. Audubon Society. Milton Bradley Co., Springfield, Mass. Price, \$1.50.

Ridgway, Robert. Color Standards and Color Nomenclature, Washington, D. C. 1912 [= 1913] Svo. Published by the author. Price, \$8.00 postage extra, 20 cts. registered.

Riley, J. H. (1) Birds Collected or Observed on the Expedition of the Alpine Club of Canada to Jasper Park, Yellowhead Pass and Mount

Robson Region. (Canadian Alpine Journal, 1912. Special Number, pp. 45-75. Price of number \$1.00. S. H. Mitchell, Sec'y-Treas. Vancouver Island, B. C.) (2) A New Name for *Tanagra sclateri* Berlepsch. (Proc. Biol. Soc. Washington, 1912, Vol. XXV, pp. 185-188.) (3) A New Hummingbird of the Genus *Chloristilbon* from Brazil. (*Ibid.*, 1913, Vol. XXVI, pp. 63-64.) (4) The King Rail of Cuba. (*Ibid.*, pp. 83-86.)

Swann, H. Kirke. A Dictionary of English and Folk-Names of British Birds. Witherby & Co., 326 High Holborn, London. 1913, Svo. Price, 10 shillings net.

Thayer, John E. and Bangs, Outram. Some Chinese Vertebrates: Aves. (Mem. Mus. Comp. Zool., Vol. XL. No. 4, August, 1912. pp. 137-200.)

Todd, W. E. Clyde. A Revision of the Genus *Chæmepelia* (Ann. Carnegie Mus. Vol. VIII. Nos. 3-4, 1913, pp. 507-603.)

Wallace, John H., Jr. Alabama Bird Day Book, 1913. Department of Game and Fish, Montgomery, Ala.

Witherby, H. F. 'British Diving Ducks' a Review (British Birds, Vol. VI, No. 12, 1913.)

Zimmer, John T. Birds of the Thomas County Forest Reserve. (Proc. Nebraska Ornith. Union. Vol. V, Part 5, April 14, 1913. pp. 51-104.)

Abstract, Proc. Zool. Soc. London, Nos. 116-122, February 18 to May 20, 1913.

Annual Report of the Director of the Board of Trustees of the Field Museum of Natural History for 1912. (Publ. 165, Report Series, Vol. IV, No. 3, pp. 183-273.)

Ardea, Tijdschrift der Ned. Orn. Vereen., II, No. 1. March, 1913.

Austral Avian Record, I, No. 8. March 20, 1913.

Avicultural Magazine, (3) IV, No. 5-7, March-May, 1913.

Bird Lore, XV, Nos. 2-3, March-June, 1913.

British Birds, VI, Nos. 10-12, March-May, 1913.

Bulletin British Ornith. Club. Nos. CLXXXV-CLXXXVII, February 27-April 21, 1913.

Bulletin Charleston Museum, IX, No. 2-4, February to April, 1913.

Condor, The, XV, Nos. 2, March-April, 1913.

Emu, The, XII, Part 3 (supplement) and Part 4, April, 1913.

Forest and Stream, LXXX, 11-23.

Ibis, The, (10) I, No. 2, April, 1913.

Journal Maine Ornith. Club. Index to Vols. I-XIII.

Meriden Bird Club, Second Report, 1912.

Messenger Ornithologique, 1913, Nos. 1-2.

New Jersey and Pennsylvania Audubon Bulletin No. 1. March, 1913.

Oölogist, The, XXX, Nos. 3-5, March-May, 1913.

Ornithologische Monatsschrift, 38, Nos. 1-4, January-April, 1913.

Ornithologisches Jahrbuch, XXIV, Heft 1-2, January-April, 1913.

Ottawa Naturalist, The, XXVI, No. 12, XXVII, No. 2, March-May, 1913.

Philippine Journal of Science, VII, No. 6, December, 1912. VIII, No. 1, February, 1913.

Proceedings of the Acad. Nat. Sci. Philadelphia, LXV, Part I, January-March, 1913.

Records of the Australian Museum, VIII, No. 4, April, 1913. X, Nos. 1-3. February-April, 1913.

Revue Francaise d'Ornithologie, V, Nos. 47-49, March-May, 1913.

Rivista Italiana di Ornitologia, II, No. 2. October-December, 1912.

Science, N. S. XXXVII. Nos. 951-962.

Scottish Naturalist, The, Nos. 15-17, March-May, 1913.

Verhandlungen der Ornith. Gesellsch. in Bayern, XI, Heft 3. April 1913.

Western Wild Life Call, Nos. 2-3, March, 1913.

Wilson Bulletin, The, XXV, No. 1, March, 1913 and Index to Vol. XXIV.

Zoölogical Society Bulletin, XVI, No. 57, Wild Life Protection Number, May, 1913.

Zoölogist, The, (4) XVII, Nos. 195-197, March-May, 1913.

CORRESPONDENCE.

Naturalists and 'Concealing Coloration.'

EDITOR OF 'THE AUK':

Dear Sir: — I hereby send you my periodical warning to naturalists that their supposed opposition to my so called ideas is in reality nothing but a state of error kept alive solely by ignorance. Any of the scores of intellectual persons who have spent even two days with me here, laugh to learn of the average naturalist's attitude about it and many of them are astonished to hear that no natural history institution has yet sent any committee to investigate this immense and revolutionary discovery. It is absolutely impossible for any one to see what I am showing and continue to doubt its significance. The discovery that thousands of species in all orders are each, no matter how they happen to look elsewhere, superhumanly perfect pictures of the very background against which it would apparently most help them not to show! Do naturalists really fancy that when a professional copier of nature, a picture-maker, tells them that these are such copies, the phenomenon is not worth investigating? Moreover it is not an individual artist that tells them this, but a representative body of them, composed of all the painters to whom I have shown the things. Many naturalists, feeling forced to believe that I am right about these wonderful copies, have said they admitted it but *disagreed about the deduction*. Here their position becomes hopeless; because, if they will not come and witness, they must take my word that the cases are practically the whole animal kingdom, all but the species that neither hunt nor are hunted; and if this is so, it is utterly absurd to try to call it accident.

ABBOTT H. THAYER.

Monadnock, N. H.,
June 12, 1913.

NOTES AND NEWS.

HERBERT BROWN, who was elected an associate member of the American Ornithologists' Union in 1885 and a member in 1901, died at Tucson, Arizona, May 12, 1913. At the time of his death Mr. Brown was 65 years old, having been born in Winchester, Virginia, March 6, 1848. He was twice married and leaves a widow and one son.

In 1873 he located in Tucson where he made his home throughout most of the remaining part of his life. In 1883 the writer lived a few months in Tucson and soon after his arrival became acquainted with Mr. Brown and found in him a most interesting companion and a congenial friend. As soon as he learned that I was an ornithologist he expressed the greatest pleasure saying that for years he had been keenly interested in birds but did not know how to identify them nor how to make skins. He soon learned to prepare excellent specimens and since that time continued his ornithological studies with much enthusiasm whenever possible. Ultimately he came to know Arizona birds very well. He was curator of the museum of the University of Arizona from its foundation, and his collections in various branches of natural history were donated to this institution. He always took an active interest in scientific work and cordially welcomed scientific workers who visited Tucson. As a consequence he made many warm friends among scientific as well as non-scientific men who will feel his death as a personal loss.

For some years after his arrival in Tucson he had many adventurous experiences especially during prospecting trips in the desert mountains of Arizona and northern Sonora. During this time he had several narrow escapes from Apache Indians and from death by thirst on the waterless desert plains of that region.

Soon after we became friends he told me about a kind of "Bob-white" quail he had often seen on the grassy plains south of Tucson, near the Sonora border, and my interest in the subject led him to secure and send to Mr. Ridgway the first specimen ever collected of the bird afterwards described as *Colinus ridgwayi*.

For many years Mr. Brown was connected with newspapers in Tucson as reporter, editor or owner, and was one of the best known and most highly respected members of the community. At the time of his death he was President of the Audubon Society of Arizona, and Clerk of the Superior Court of Pima County.—E. W. N.

THE study of bird songs is a department of ornithology that has failed to receive the attention that it deserves or at least has failed to advance along true scientific lines. This may be due in part to the rather surprising attitude of most leading ornithologists toward the method employed in recording bird song, i. e. the musical notation. One ornithologist says

"Musical notation might as well be Greek so far as it gives an adequate idea of song to any other than the transcriber," and another while admitting the difference in tone quality between notes sung by a bird and notes played on a piano, fails to realize the mechanical nature of the piano scale and cites his inability to recognize songs played on the piano from records made in musical notation by one of the leading students of bird song, as indicating the failure of this method. Of forty-one songs played by the pianist "thirty-three conveyed absolutely no impression, we could not even guess at their identity."

There are of course two objects in view in recording bird song, (1) to provide a description of the song that will enable someone else to reproduce or recognize it, (2) to make an accurate record of the song which may be compared with other records made by the same or other individuals, the series forming the basis for a scientific study of the subject.

The first is the phase of the subject that has received most attention. No matter what method of notation or description may be used it is extremely doubtful whether any bird song can be so recorded that one who has never heard it can reproduce it with any degree of accuracy from the printed record. Even such an easily imitated call as that of the Whippoorwill has to be heard before it can be reproduced with proper accent, speed, and quality.

When it comes to recording a song so that one will be able to recognize in the description a song that he has actually heard, the case is very different and the calls and songs of many species may be so recorded. The method of notation may vary, it may be syllabic or it may be musical but neither will give any idea of quality which can only be supplied, and incompletely at that, by some descriptive clauses. To the musician however the musical notation is by no means "Greek," and with some description of quality he gets a far better idea of a song accurately represented on a musical staff than the non-musician is able to obtain from a syllabic representation.

Some syllabic representations recall the note very accurately as 'Whippoorwill,' 'Pee-wee,' 'Bob-white'; the 'Pea-body, pea-body, pea-body' of the White-throated Sparrow etc. etc. Others are less happy, while a majority of efforts, where the song is less striking, are almost ridiculous. One has but to compare the efforts of various writers to see how widely their ideas of proper syllabic representation of song differ. When attempt is made to illustrate individual variations of the song of any species by this method one usually loses entirely the points of resemblance between the variations which are so well shown by the musical notation.

The more important phase of the study of bird song is the formation of a series of records as a basis for scientific comparisons and deductions, such records constituting the 'specimens' for this line of investigation. In this work the use of musical notation is absolutely essential, just as mathematics is essential in computing averages and percentages of error, in bird migration, or chemical notation in recording the composition of pigments or other products of the bird's structure. These are all unintelligible to

one who is ignorant of them but a knowledge of them is necessary to investigation in the fields to which they apply.

The student of bird song should not perhaps be too much of a musician; he should moreover have in addition a full appreciation of the importance of scientific accuracy and of the ultimate objects of the investigation. Records to be of value must be made by actual test of each note with a graded pitch pipe, as is done by our best observers, while the time must be correctly gauged by some metronome contrivance. The memorizing of a song and its later transcription on the musical staff, will not suffice.

Accurate records require a vast amount of painstaking effort but they embody the scientific musical basis of the song — that which is essential for its study. They have already shown us that there is great individual variation in the song of any species, the apparent uniformity being due to the identity of certain leading notes or intervals in the songs of all individuals. The possibilities for future work are innumerable. The whole question of mimicry is involved, upon which we have diametrically opposite opinions and between these only a study based on such records can decide. Are the songs of such birds as the Mockingbird really mimicry or is the resemblance to the songs of certain other species merely accidental? When the individuals of a species in the same immediate neighborhood are found to sing in the same key, does it indicate a desire on the part of the birds for harmony or are these birds of common ancestry and have they inherited the tendency to sing at a certain pitch along with other inherited characters? Have birds really an appreciation of music similar to that possessed by man, or is the complementary nature of the songs of several individuals answering one another accidental and due in part to the imagination of the hearer? These and many other questions are awaiting conclusive answers and in investigating them we must remember that bird song is music and in its scientific study must be measured by musical standards. At the same time the need of rigid accuracy and unbiased judgment must ever be kept in mind to guard against the enthusiasm of the musician which like that of the artist is sometimes inclined to run away with him when dealing with such problems.

THE American Museum's Colombian expedition of 1913, returned to New York City early in May, after an absence of four months. The expedition was under the leadership of Frank M. Chapman, who had as his chief assistant that experienced collector in tropical America, George K. Cherrie, while Louis Agassiz Fuertes served as the artist of the expedition, and Thomas Ring, Paul Griswold Howes, and Geoffrey O'Connell acted as assistants. The objects of the expedition were to secure material for a Habitat Group of the bird-life of the Magdalena Valley; to determine as accurately as possible the limits of the so-called "Bogotá" region from which, during the past seventy-five or more years, doubtless hundreds of thousands of birds have been shipped; and to collect a series of representative birds from this region which should be properly labeled as regards

date, sex, and especially locality and altitude. We understand that the expedition in all these respects made a great success, no less than 505 species of birds being collected in some forty-five days of actual field work; an indication of the richness of the avifauna of this part of the world.

THE many members of the American Ornithologists' Union who have enjoyed a delightful day's outing at the Club-house of the Washington Biologists' Field Club, on Plummers Island in the Potomac, will congratulate the Club upon the completion of twelve years of ownership of its beautiful island home, which is marked by the issue of an attractive little brochure giving a history of the organization and its work.

As an illustration of what intensive study will yield it may be mentioned that on the twelve acres included on Plummers Island there have been identified, 26 mammals; 143 birds; 18 reptiles; 12 amphibia; 40 fishes; 1500 beetles; 500 flies; 420 bugs; 60 orthoptera, 550 seed bearing plants and 286 lower plants. Papers to the number of 120 have been published dealing to some extent with the fauna and flora of the island and 106 new species, 12 new genera and 2 new families have been based on material collected there.

READERS of 'The Auk' will be pleased to learn that Mr. Robert Ridgway has completed the manuscript of Part VI of his 'Birds of North and Middle America' and is now engaged on the synonymy and keys to higher groups for the remainder of the work.

THE appearance of Index Zoologicus No. II published by the Zoological Society of London and comprising a list genera proposed from 1901-1910 as well as some overlooked names of earlier date, will be welcomed by systematic ornithologists. They will however be surprised to find no mention of Dr. C. W. Richmond's List of Genera of Birds 1901-1905 (Proc. U. S. Nat. Mus., Vol. 35, pp. 583-655.—Dec. 16, 1908), the most important paper on bird genera that has appeared in the period under consideration. We might mention also that the genus *Macrosoma* credited to Aves in the Index, proves to be based upon a reptile, but we trust that such slips are rare.

THOSE who are interested in the stability of scientific nomenclature have felt more or less apprehension as to the outcome of the agitation against the strict application of the law of priority. The result of the discussion at the Ninth International Congress of Zoölogy at Monaco, however, was eminently satisfactory and will inspire confidence in the stability of the International Code and the decisions of the International Commission. According to the report published in Nature, "A resolution was adopted which empowered 'the nomenclature commission to suspend the rules in cases where it would cause great confusion to carry them out. This power

is, however, safeguarded by such stringent conditions that there is no fear of its being used except in very urgent cases." This should be satisfactory to everyone, for if we accept the opinions of the Commission, as we should do, in all cases which give rise to different interpretations of the Code, we can just as easily accept their decision in such extraordinary cases as will be covered by the new resolution. Furthermore the generous attitude of the Congress in devoting so much time to the consideration of the subject and its thorough discussion in the general meeting cannot help but disarm the critics, bring both sides together and make for stability in the end.

MESSRS. WITHERBY & Co. have been appointed European Agents for "The Emu," the organ of the Royal Australasian Ornithologists' Union, and copies of that publication can now be obtained at 326, High Holborn, London.

CIRCULARS 92 and 93 of the Biological Survey U. S. Dept. of Agriculture setting forth the proposed regulations for the protection of migratory birds in accordance with the recently enacted Federal Law reach us just as we go to press. They deserve the careful study and support of all sportsmen and ornithologists.

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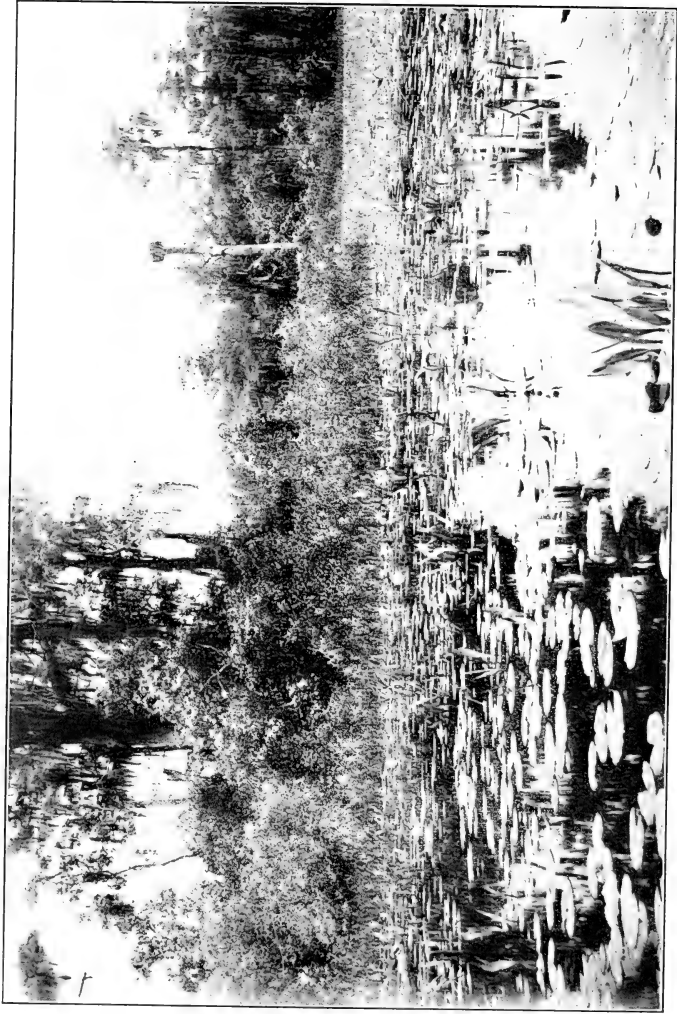
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CYPRESS 'HEADS' ON CHASE PRAIRIE, WITH A FISH HAWK'S NEST.

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No. 4

A BIOLOGICAL RECONNAISSANCE OF OKEFINOKEE SWAMP: THE BIRDS.

Plates XIV-XX.

BY ALBERT H. WRIGHT AND FRANCIS HARPER.

THE famous Okefinokee, 'the greatest natural wonder' of Georgia, and 'one of the least known areas of its size in the eastern United States,' covers parts of Charlton, Ware, Clinch, and Pierce Counties, and extends a little beyond the Florida line. It is about 39 miles in greatest length by 26 miles in greatest width, and occupies some 660 square miles. Among the fresh-water swamps east of the Mississippi, it is exceeded in size only by the Everglades; and in the richness of its historical and literary associations, in its diversified topography, in the marvelous beauty and charm of its interior, and in its extraordinary interest as a faunal and floral area, Okefinokee Swamp is unique.

HISTORY.

A volume might be written concerning the history of the Okefinokee, of which we shall give here only the briefest abstract. From very early times this swamp has been the subject of strange legends and fanciful speculation. As long ago as 1682 it appeared on a map¹ as a 'Lacus Mag[nus]' at the source of the St. Mary's River (Rio de May), and in 1776 it was represented² as the 'Great

¹ Winsor, J. Narr. & Crit. Hist. America. Vol. IV, 1884, p. 227.

² The American Military Atlas, 1776, Map 5.

Swamp Owaquaphenoga,' its boundaries reaching almost to the Flint River. This was the heart of the country of the Lower Creeks and Seminoles, who enshrouded the swamp with mystery and peopled it with an immortal race which neither they nor the Spaniards could conquer. In Bartram's well-known account¹ of this pleasing legend, one of the islands in the swamp is represented as 'a most blissful spot of the earth; . . . it is inhabited by a peculiar race of Indians, whose women are incomparably beautiful,' and are called 'daughters of the sun.'

The Okefinokee has repeatedly served as a refuge for non-combatants or the weaker side in wars. During the Revolution some Indians who were unwilling to take part in the war settled here. In the Seminole or Florida War it proved an almost impregnable fastness for the Creeks and Seminoles. At this period a number of the places in the swamp and its vicinity received their present names, e. g., Billy's Island and Billy's Lake (after Billy Bowlegs, a Seminole chief), and Floyd's Island (after Gen. John Floyd, who dislodged some Indians from this island). In the Civil War Confederate deserters sought its protection, and even to-day miscreants flee here to evade the arm of justice.

The swamp has been the subject of untold memorials and petitions on behalf of the legislatures and the officials of Florida and Georgia. In 1800 the first good boundary line between these two states was established by Ellicott, and his famous mound in the southeastern corner of the swamp is not yet entirely obliterated. In 1829, in 1850 (approximately), and finally in 1879, the Okefinokee commanded attention because of a projected ship canal connecting the Atlantic Ocean with the Gulf. At the last date a careful survey of its confines was made for the federal government. It was proposed to send feeders for the canal into the swamp, and the canal itself was to pierce its southern part.

Of drainage investigations and commercial operations in the swamp, a few excerpts from McCallie's 'Drainage Situation in Georgia'² will suffice to furnish an account. He speaks first of 'Col. R. L. Hunter's survey of the Okefinokee Swamp, made in 1856-7 . . . , with a view of ascertaining the practicability of its

¹ Bartram, Wm. *Travels, etc.* Phila., 1791, p. 25.

² McCallie, S. W. *Bull.* 25, *Geol. Survey of Ga.*, 1911, pp. 14-18.

drainage, the cost of the same, etc. . . . There was furnished to the Governor a map of the swamp, with the elevation around the whole swamp and lines of ditches, which it was estimated would drain the swamp at a cost of \$1,067,250. . . .

'On November 4, 1875, by direction of Governor J. M. Smith, the party of the Geological Survey operating in Southern Georgia joined the "Constitution Expedition," organized by the proprietors of the paper of that name in Atlanta, and remained until December 14th. A line of levels was run by Mr. C. A. Locke, engineer of the "survey," from Mixon's Ferry on Suwanee River to Trader's Hill on St. Mary's,

'In 1889, the Okefinokee Swamp, or that part of it owned by the state of Georgia, comprising an area of 380 square miles, was purchased by the Suwanee Canal Company at 26½ cents per acre. The object of this company in acquiring the swamp was, first, to utilize the timber which was known to exist therein in large quantities, and subsequently to drain the swamp and use the lands for agricultural purposes. With these objects in view, the canal company began, in September, 1891, the construction of a canal from St. Mary's River to the swamp, a distance of about six miles. Later this canal, which was 45 feet wide and six feet deep, was continued into the swamp for something like 12 miles. . . . The Suwanee Canal Company, under the presidency of Captain Henry Jackson, of Atlanta, was successful in winning a large amount of cypress and other timber from the eastern side of the swamp, but operations were discontinued before the canal was sufficiently completed to have but little effect in draining the swamp as a whole. The large holdings of the Suwanee Canal Company have, within the last two or three years, been acquired by the Hebard Lumber Company, which is at present engaged in cutting and preparing for market the timber in the large cypress forest on the northwestern margin of the swamp.'

Few men of scientific interests or training have ever entered the swamp, and still fewer have traversed or explored any considerable part of it. Paul Fountain, in his 'Great Deserts and Forests of North America,' speaks of visiting it in 1871 and 1876, but his description is so far from what would be expected of one who had been in the interior, that it is extremely doubtful if he saw more than the borders of the swamp.

Doubtless the first ornithologist to see the real Okefinokee was Mr. C. F. Batchelder, who, about twenty-five years ago, entered on the eastern side and went as far as Black Jack Island, where he remained a day or two.

Maurice Thompson's writings contain some interesting references to the Okefinokee. His observations on the nesting of the Ivory-billed Woodpecker, so delightfully described in 'A Red-headed Family,'¹ were made 'in one of those shallow cypress lakes of which the larger part of the Okefinokee region is formed'; and he remarks further that 'Near by, to the westward, lay one of those great gloomy swamps, so common in southeastern Georgia, so repellant and yet so fascinating, so full of interest to the naturalist, and yet so little explored.' What appear to have been later experiences with the Ivorybill in the same locality are recounted in 'An Archer's Sojourn in the Okefinokee.'² In this paper, however, he states that his *locus* was exactly twenty miles southeast from Blackshear, Ga., on a branch of the Satilla; and this places it in or near an area sometimes known as Little Okefinokee Swamp, which is entirely separate from the real Okefinokee, and miles distant from it. In 'My Winter Garden,'³ also, Thompson speaks casually of having been 'deep in the Okefinokee'; and yet it is almost inconceivable that he could have seen for himself the marvels of the swamp's interior without treating them extensively with his gifted pen.

In August, 1902, R. M. Harper and P. L. Ricker spent two days in the swamp, devoting their attention chiefly to botanical exploration. They traversed the whole length of the canal and made a side trip to Bugaboo Island. The former has published the most complete account⁴ of the swamp that has yet appeared. Not only this article but also Dr. Harper's notes on the plants have helped us in the preparation of the present paper.

Prof. Albert M. Reese, while studying the breeding habits of the alligator, visited the Okefinokee in the summers of 1905 and 1906, on the second occasion 'penetrating the swamp to its centre.'⁵

¹ Thompson, Maurice. *By-ways and Bird Notes*. New York, 1885, pp. 23-39.

² ———. *Atlantic Monthly*, LXXVII, April, 1896, pp. 486-491.

³ ———. *My Winter Garden*. New York, 1900, p. 222.

⁴ Harper, R. M. *Okefinokee Swamp*. *Popular Science Monthly*, LXXIV, June, 1909, pp. 596-614.

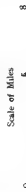
⁵ Reese, A. M., Smith. *Misc. Colls.*, XLVIII, 1907, Quart. Issue, Vol. III, Part 4, pp. 381, 382.



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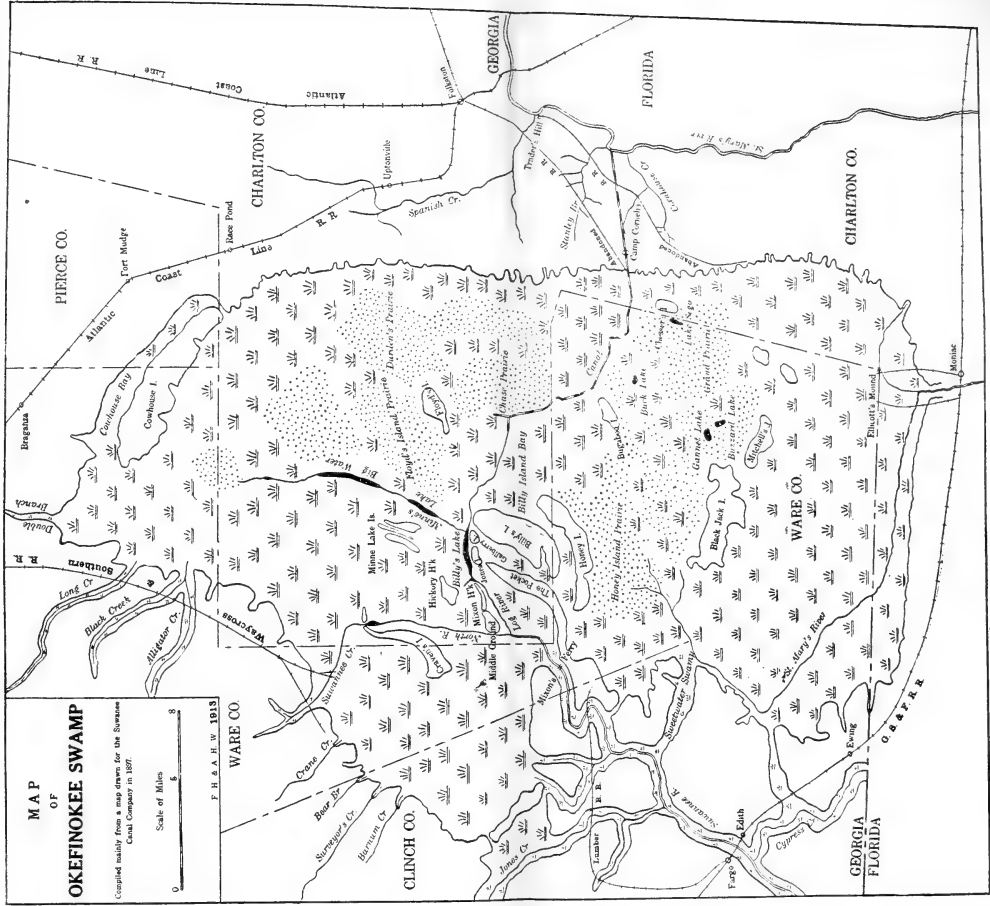
OKEFINOKE SWAMP

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The Soil Survey of the Waycross Area, published by the U. S. Department of Agriculture in April, 1907, contains a fairly good description of the northern end of the swamp.

Prof. J. M. Reade, of the University of Georgia, and Mr. Huron Smith, of the Field Museum of Natural History, both Cornellians, entered the swamp by way of the canal in December, 1909, and made botanical investigations during a stay of a week.

Our own observations covered most of the period from May 6 to July 13, 1912. On the first-mentioned date Harper, with David Lee as guide, entered the swamp by way of Suwannee Creek on the northwestern side, but finding the route practically impassable after the first few miles, they made a detour through Waycross and Braganza to the northeastern side. Setting out again by boat from Cowhouse Island on the morning of May 8, they reached Billy's Island that night, meanwhile having passed through the Big Water, Minne's Lake, and the eastern end of Billy's Lake. During the next fortnight, with Billy's Island as a starting point, trips were made to Mixon's Hammock, Honey Island, the canal and Chase Prairie, Floyd's Island Prairie, and Floyd's Island. An effort to reach the Minne Lake Islands was also made, but failed. On May 23 they departed from the swamp, as they had entered, by way of Cowhouse Island.

On May 28 the Cornell University Expedition proceeded from Fargo on the southwestern side of the swamp. The party included Professors J. C. Bradley and C. R. Crosby, of the Dept. of Entomology, Dr. A. H. Wright, of the Dept. of Zoölogy, S. C. Bishop and M. D. Leonard of the class of 1913, Headmaster W. D. Funkhouser of the Ithaca High School, and Paul Battle, of Bainbridge, Ga. Mr. E. L. Worsham, State Entomologist of Georgia, and Mr. C. S. Spooner, Asst. State Entomologist, accompanied the party during the first week, and to them we are indebted for several favors. Professor Bradley had made previously (1909, 1910, and 1911) brief reconnaissances on the eastern (Suwannee Canal) and northwestern (Suwannee Creek) borders of the Okefinokee. From Fargo, the party was transported on a lumber tramway to a point about two miles from Mixon's Ferry. Thereupon, with guides whom Mr. R. W. Bennett, of the Fargo Land Company, had kindly secured for us, we began a walk of ten or twelve miles over corduroy

roads, sometimes waist-deep, to Billy's Island, where camp headquarters were established. The route from Fargo to the camp, by way of Mixon's Ferry, the Pocket, Jones Island, and Gallberry Island, was frequently traversed. Billy's Island, Billy's Lake, and Mixon's Hammock were quite thoroughly explored. Honey Island, Honey Island Prairie, Floyd's Island Prairie, and Floyd's Island were visited for periods covering from one to three days. A special trip was made to a heronry between Fargo and Mixon's Ferry. Two attempts were made to reach the Minne Lake Islands, the first from Minne's Lake due west, and the second from Billy's Lake due north. The entire party was successful in making the second trip. On July 13 we left the swamp, coming out by way of Billy's Lake, Log River, and Suwannee River to Mixon's Ferry — a course frequently explored during our sojourn in the swamp.

A few words should be said here concerning the Lee family of Billy's Island, to whom we are indebted for much valuable information concerning the Okefinokee and its natural history. Throughout our stay in the swamp we were in daily contact with these people, and employed four of the men as guides. The family settled here about thirty years ago, and have remained the only permanent inhabitants of the swamp's remote interior. (Two other families, long known as inhabitants of the swamp, are the Mixons on the western, and the Chessers on the eastern borders.) During their long residence in the heart of the swamp the Lees have gained an unusually intimate acquaintance with the various forms of its plant and animal life. They not only have names for practically all the birds except some of the smaller and less distinctive Passeres, but could also give interesting and very trustworthy accounts of their habits. They are likewise familiar with most of the other vertebrates. Their knowledge of the plants of the swamp is scarcely less full; and there were few species that they could not name for us. While most of their local names are either exactly or recognizably similar to those in general use in the South, others appear to be altogether unique; and we consider them all of such interest as to be worthy of inclusion in the annotated list of species.



CHASE PRAIRIE, WITH PINE 'HEADS.'

HABITATS.

In the eastern United States few, if any, areas of equal extent afford such exceptional opportunities for the study of animal life in a primeval state as does Okefinokee Swamp. Handicapped as we were by time and the difficulties of exploration, we can make this report only a preliminary survey of ecological conditions which might well occupy years of immediate and attentive study, before the commercial encroachments destroy this paradise for the present-day naturalist.

As R. M. Harper¹ has pointed out, 'The various aspects of different parts of Okefinokee Swamp seem to depend almost entirely on the distance of the sandy bottom below or above the water level.' The swamp may be divided conveniently into four major ecological divisions: the islands, the cypress 'bays,' the prairies, and the watercourses. The cypress 'bays' and the prairies are probably about equal in area, and cover by far the greater part of the swamp. A glance at the map (Plate I) will show the extent of the islands and the more important prairies. Though all of the swamp, exclusive of the islands, is inundated, the smallest of the four divisions is the open watercourses.

The islands. These are covered for the most part with pine barrens (Plate XVII). The long-leaf pine (*Pinus palustris*) predominates in the drier areas, and the slash pine (*P. Elliottii*) in the more moist situations. Beneath the pines is an abundant and practically continuous growth of saw-palmetto (*Serenoa serrulata*). Intermixed with it is a heath (Ericaceae) society, composed of several species of huckleberries (*Gaylussacia*) and blueberries (*Vaccinium*), 'poor grub' (*Xolisma ferruginea*), 'gallberry' (*Ilex glabra*), and 'calico bush' (*Kalmia hirsuta*). The huckleberries and blueberries grow in the utmost profusion, and form an important element in the food of many birds and mammals. A third and lower group of plants consists of sedges and other small herbs. The islands are so flat and rise so slightly above the level of the swamp, that there is very little drainage; and after rains the sandy soil is covered with water in many places. Over the limited

¹ *Loc. cit.*, p. 606.

land surface crawl numerous snakes, among which may be mentioned the spreading adder (*Heterodon platyrhinus*), black snake (*Zamenis constrictor*), king snake (*Ophibolus getulus*), and three species of rattlesnakes (*Crotalus adamanteus*, *C. horridus*, and *Sistrurus miliarius*). The Florida terrapin (*Chrysemys floridana*) and the southern soft-shelled turtle (*Trionyx ferox*) come upon the islands in large numbers to deposit their eggs, which furnish a much-prized article of diet for the predaceous mammals, such as the opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), Florida bear (*Ursus floridanus*) skunk (*Mephitis elongata*), and wild cat (*Lynx ruffus*). That the ground-loving birds maintain themselves while so many enemies are rampant in these restricted quarters, is surprising. Furthermore, some of the islands are often burnt over by the residents or by hunters in order to improve the grazing or to facilitate hunting. Among the birds that are most typical of this habitat and show a decided preference for it, are the Bob-white, Red-cockaded Woodpecker, Wood Pewee, Florida Blue Jay, Southern Meadowlark, Pine-woods Sparrow, White-eyed Towhee, Summer Tanager, Pine Warbler, Brown-headed Nuthatch, and Bluebird. The Sandhill Crane, Florida Red-shouldered Hawk, Yellow-billed Cuckoo, Southern Hairy Woodpecker, Pileated Woodpecker, Red-headed Woodpecker, Red-bellied Woodpecker, Kingbird, Crested Flycatcher, Yellow-throated Warbler, Carolina Wren, and Florida White-breasted Nuthatch also occur here (and most of them commonly), but at the same time are found in greater or less numbers elsewhere within the swamp.

The pine barrens surrounding the swamp bear a general resemblance in topography and vegetation to those on the islands, but are for the most part somewhat higher and drier. They have suffered much from the lumbering and turpentine industries. Among the birds, the Wild Turkey, Mourning Dove, Sparrow Hawk, Southern Hairy Woodpecker, Flicker, Chuck-will's-widow, Nighthawk, Purple Martin, and Brown Thrasher appear to be more common in the environs than in the pine barrens within the swamp. Among the other groups, it is asserted that such forms as the gray fox (*Urocyon cinereoargenteus*), 'salamander' (*Geomys*), and coachwhip snake (*Zamenis flagellum*) do not reach the Okefinokee islands. An intensive study and comparison of the two faunas would doubtless reveal other interesting differences.

The hammocks occupy practically the whole of some of the smaller islands, and the borders of some of the larger ones (Plate XX). The tree growth here consists of such species as 'spruce pine' (*Pinus Tæda*) 'live oak' (*Quercus geminata?*), 'water oak' (*Quercus nigra*), 'loblolly' (*Magnolia grandiflora*), 'sweet bay' (*Persea pubescens*), and sweet gum (*Liquidamber Styraciflua*). Saw-palmetto forms a conspicuous part of the undergrowth. The Pileated Woodpecker, Red-bellied Woodpecker, Crested Flycatcher, Acadian Flycatcher, Cardinal, Hooded Warbler, and Carolina Wren are the common birds of this habitat; it is noteworthy, however, that none of them are confined to it. Our few records of the Red-eyed Vireo within the swamp were made in the hammock on Billy's Island.

Cypress 'bays.' (Plates XX and XVIII.) The dominant plant growth of the 'bays' is the pond cypress (*Taxodium imbricarium*); and probably nowhere else in the world does it attain a heavier growth or finer proportions. The river cypress (*T. distichum*) also is found in some places, especially along the lakes and 'runs.' Among other important trees are the black gum (*Nyssa sylvatica*), red bay (*Gordonia Lasianthus*), white bay (*Magnolia virginiana*), and sweet bay (*Persea pubescens*). The red maple (*Acer rubrum*) is less common. From the trees hang great festoons of Spanish 'moss' (*Tillandsia usneoides*). The undergrowth consists of such plants as the 'hurrah bushes' (*Pieris nitida* and *Leucothoë racemosa*), 'gallberry' and other shrubs, tall ferns (*Lorinseria* and *Osmunda*), and poison ivy (*Rhus radicans*). In many places the 'bamboo vine' (*Smilax laurifolia*) and the muscadine (*Vitis rotundifolia*) bind the undergrowth into an impenetrable tangle. As a general rule, these shrubs and vines are more abundant at the edges of the 'bays' along the watercourses, where they receive more sunlight than within the depths of the cypress forests. During our stay the water in the 'bays' stood at an average depth of several feet, but in drier seasons this depth is greatly reduced and the underlying muck is exposed over large areas.

The southern gray squirrel (*Sciurus carolinensis*), raccoon, Florida bear, and wild cat are at home in the cypress 'bays.' The pied water snake (*Natrix taxispilota*) and the cottonmouth (*Ancistronodon piscivorous*) drop from the bushes along the 'runs' as one

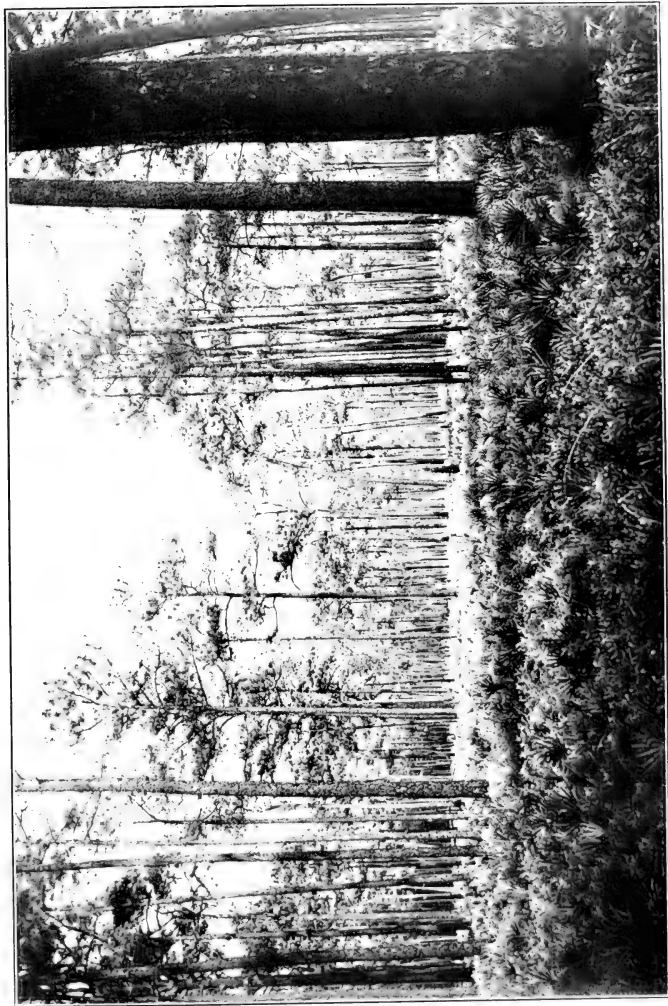
paddles by. The birds most typical of this habitat are the Florida Barred Owl, White-eyed Vireo, Prothonotary Warbler, Swainson's Warbler, and Parula Warbler. Others that are not confined to the cypress 'bays,' but are more common here than in any other habitat, are the Florida Red-shouldered Hawk, Yellow-billed Cuckoo, Pileated Woodpecker, Acadian Flycatcher, Cardinal, Carolina Wren, Tufted Titmouse, and Carolina Chickadee. Among the more generally distributed forms that occur here in numbers are the Red-bellied Woodpecker, Crested Flycatcher, Yellow-throated Warbler, Hooded Warbler, and Florida White-breasted Nuthatch.

There are several minor ecological divisions that bear more or less resemblance to the cypress 'bays.' These are the cypress ponds, sphagnous bogs, and prairie 'heads.'

Within the larger islands are many small cypress ponds, generally of only an acre or two in extent. (Plate XIX.) They do not differ greatly from the cypress 'bays,' although the trees are not so close together and the undergrowth is for the most part confined to the edges. Frequently an alligator makes this its haunt. Practically every one of the ponds furnishes a home for a pair of Prothonotary Warblers and for a pair of Florida Yellowthroats as well. The flocks of Florida Grackles are found most commonly here, and the Carolina Chickadee is frequently noted. The Wood Ibis also is said to feed in these ponds.

In some cases the cypress 'bays' directly adjoin the islands. A number of islands, on the other hand, are enclosed by sphagnous bogs of varying width, beyond which lie the prairies. In the bogs the cypresses are smaller and grow much more openly than in the 'bays'; the slash pine also is common. The plants of the undergrowth, which is extraordinarily thick, are much the same here as in the 'bays,' but they also include the pitcher plants (*Sarracenia minor* and *S. psittacina*). A dense bed of sphagnum, which sways and quivers underfoot, rests upon the water and muck. Some of the prairie 'heads,' (Plate XVI), in which slash pines replace the cypresses, and where the sphagnum grows in great profusion, may also be included in this division. Our observations in this habitat, though very limited, apparently show that the bird species are far from numerous.

The cypress 'heads' or 'houses' (Plate XIV) on the prairies vary



PINE BARRENS ON BILLY'S ISLAND.



MINNE'S LAKE AND BORDERING CYPRESS 'BAY.'

1911

1912

1913

1914

1915

1916

1917

1918

in size from a clump of a few trees to areas of a mile or more in extent, the latter differing little, if at all, from the cypress 'bays.' The smaller 'heads' are generally covered with buttonbushes (*Cephalanthus occidentalis*), 'hardwood' (*Cyrilla racemiflora*), white alders (*Clethra alnifolia*), 'hurrah bushes,' and 'bamboo vines'; and enclosed within this shrubby tangle are white bays sweet bays, and a few taller cypresses. Some islets of this sort contain ground dry enough to furnish camping sites. The Yellow-billed Cuckoo, Kingbird, Florida Grackle, Yellow-throated Warbler, Florida Yellow-throat, and Carolina Wren are common here. We also found the Water-Turkey, Ward's Heron, and the Fish Hawk nesting in these 'heads.'

Prairies. (Plate XVI.) The 'prairies' of the Okefinokee are by no means prairies in the ordinary sense of the term. One prairie may differ considerably from another, but all are essentially flooded marshes, or shallow lakes filled to a great extent with aquatic vegetation. In wet seasons one may pole his boat almost at will over these expanses; during dry summers, however, the muck is exposed, and little water is left except in the deeper parts, such as the 'gator holes.' On Floyd's Island Prairie the water is so shallow, even during the wettest seasons, and the sphagnum and other aquatic plants grow so profusely, that navigation is extremely difficult, if not impossible, over a large portion of this area. The plants of the prairies have their roots in the underlying muck, which in turn rests upon a sandy bottom. The vegetation is arranged in several distinct zones. In the deeper and more open parts, the species of greatest abundance and most widespread distribution is the white water-lily (*Castalia odorata*). Interspersed with it are arrow-head (*Sagittaria*), 'wampee' (*Pontederia cordata*), 'bull-tongue' (*Orontium aquaticum*), arrow arum (*Peltandra*), and other characteristic aquatic herbs. Here and there the water-lilies are replaced by purple bladderworts (*Utricularia purpurea*), upon the seeds of which raccoons and winter Ducks feed regularly. In the shallower parts, thick beds of 'maiden cane' grow. This zone is especially noticeable around the edges of some of the cypress 'heads,' the shrubs and trees of which rise in succession behind it. Saw-grass, also, grows with the 'maiden cane' in some small open glades (which may be likened to prairies) within the cypress 'bay' north of Billy's Lake.

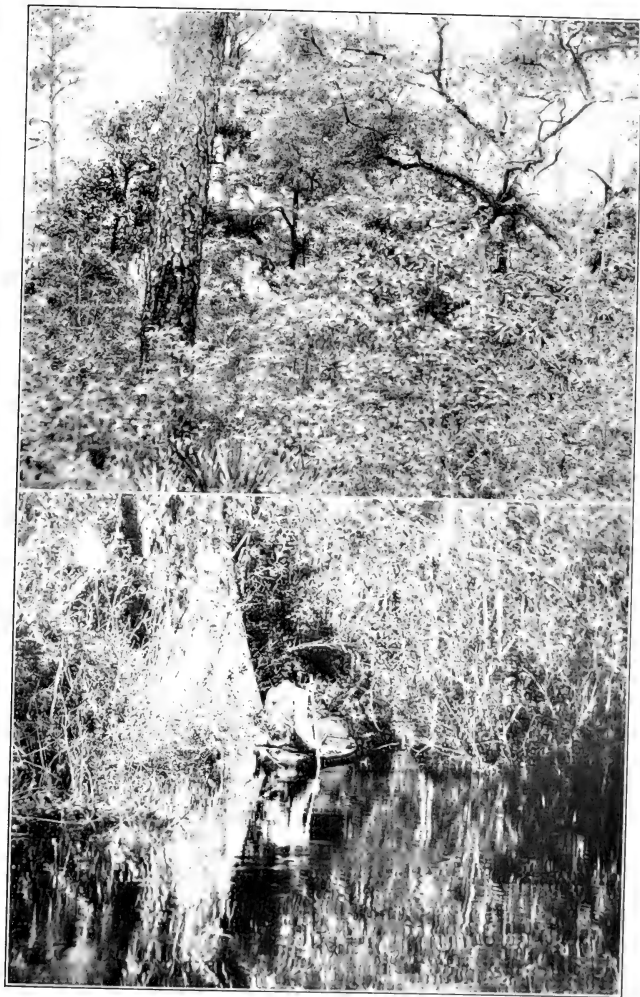
The bears wander from 'head' to 'head' across the prairies, and in the sphagnum bordering the 'heads' are seen the trails, or so-called 'slides,' of otters (*Lutra hudsonica*). Among the water-lilies abound ribbon snakes (*Eutaenia sackenii*), killifishes (*Fundulus* and *Gambusia*), and several species of frogs (*Chorophilus*, *Acris*, *Hyla* and *Rana*), whose evening chorus is one of the features of the swamp. In some of the deeper parts, which are either naturally free of vegetation or kept clear by alligators (*Alligator mississippiensis*) and hence called "'gator holes"—there are also southern soft-shelled turtles and warmouths (*Chænobryttus gulosus*). These parts are a foraging ground for the Water-Turkey, Wood Duck, and Fish Hawk. Ward's Heron, the American Egret, the Little Blue Heron, the Green Heron, and the Sandhill Crane feed where the water is not too deep, and in dry seasons these and other waders doubtless occur on the prairies in much larger numbers than we found them during the period of exceptionally high water in 1912. The Florida Redwing nests here among the aquatic plants rising above the surface.

Watercourses. (Plate XVIII.) This habitat may be considered to include all the bodies of open water in the swamp, among which may be mentioned Billy's Lake, Minne's Lake, the Big Water, the abandoned logging canal, Buzzard Lake, Gannet Lake, and the upper courses of the Suwannee River. (See map.) The surface of the water in the swamp varies in level as much as 15 feet between various points. Consequently, throughout most of the swamp there is a perceptible current in the direction of the Suwannee River; it is especially noticeable in the narrow 'runs' or water trails that afford the only means of traversing the cypress 'bays' by boat. Most of the lakes are simply wider and deeper parts of these 'runs'; and Billy's Lake, the largest body of water in the Okefinokee, is probably not over a hundred yards in its greatest width. (The width of some of the lakes is unavoidably exaggerated in the map.) Yellow water-lilies or 'bonnets' (*Nymphaea macrophylla*) form an abundant and characteristic growth in the 'runs' and along the borders of the lakes; the swamp loose-strife (*Decodon verticillata*) and purple bladderwort (*Utricularia purpurea*) are also found here.

Some of the characteristic vertebrate forms of the water courses



A CYPRESS POND ON BILLY'S ISLAND.



1. HAMMOCK ON FLOYD'S ISLAND.
2. A RUN THROUGH A CYPRESS BAY (BILLY ISLAND BAY).

are the pied water snake, pilot snake (*Coluber obsoletus*), southern soft shelled turtle, alligator snapper (*Macrochelys lacertina*), alligator, large-mouthed black bass (*Micropterus salmoides*), warmouth, and other basses (Centrarchidae), two pickerels (*Esox americanus* and *E. reticulatus*), and various catfishes (*Ameiurus*) and killifishes. The summer birds of this habitat are few in number, including only the Water-Turkey, Wood Duck, and Fish Hawk. The Chimney Swift, which skims low over the surface, may also be mentioned. In the winter, when Coots and various species of Ducks arrive from the north, the numbers of water birds are considerably augmented.

The close affinity of the Okefinokee avifauna with that of the Florida peninsula is shown by the presence of such birds as Ward's Heron, the Limpkin, the Florida Blue Jay, and the Florida Red-wing. The last two, while intermediate between the typical species and the subspecies, are distinctly referable to the Florida form. The same statement could very likely be made concerning the Night-hawk if we had secured specimens. Other birds of the swamp whose ranges extend only slightly further north along the Atlantic coast are the Sandhill Crane, Florida Red-shouldered Hawk, Florida Barred Owl, Florida Grackle, Pine-woods Sparrow, White-eyed Towhee, and Florida White-breasted Nuthatch. In contrast to the Blue Jay and the Red-wing, the Bob-white of the Okefinokee belongs decidedly to the northern form, though the specimens show some slight tendencies toward the characters of *Colinus virginianus floridanus*.

LIST OF SPECIES OBSERVED.

1. **Anhinga anhinga.** WATER-TURKEY.—These birds are common on some of the larger waterways of the Okefinokee. They seem to be congregated chiefly along the Big Water and on the Suwannee River, where single birds or small groups were frequently seen soaring high in the air. On Billy's Lake a few were observed. In some years they have nested at the north end of Minne's Lake. On May 21 a colony of three or four nests was located in a cypress head on Floyd's Island Prairie. Curiously enough, the birds were sitting on empty nests, and a broken eggshell halfway down one of the cypress saplings was the only material evidence of breeding. No eggs were found when the same place was visited on June 27. Sometimes the Water-Turkeys nest in isolated pairs, and at

other times in the heronries. On June 18 a nest was found about five feet above the water in a buttonbush (*Cephalanthus occidentalis*). It consisted of a platform of sticks, larger and more compact than the surrounding nests of the Little Blue Heron. On the edge of this dung-covered nest four young were resting. The old bird perched in a pine tree at a distance, and did not approach while we were present.

The natives say that this species sometimes gorges itself to such an extent that it becomes unable to fly, and can make its escape only by the water. At the approach of our boat in the Minne Lake Run, a Water-Turkey plunged head foremost from its perch and disappeared, though indicating its swift course beneath the surface by the shaking bonnet stems. A bird alternately flapping and sailing across a bit of bonnet-strewn prairie, against a background of moss-hung cypresses, presents a striking and beautiful spectacle.

A Water-Turkey's bill is no mean weapon, as attested by the blind eye of one of the native boys, who received a thrust from a tame bird.

2. **Aix sponsa.** WOOD DUCK; 'Squealer'; 'Summer Duck'.—The Wood Duck is still found in considerable numbers on the lakes, streams, and flooded prairies of Okefinokee. It is apparently the sole summer resident of its tribe in the swamp, for the Florida Duck is unknown there. The Big Water and Honey Island Prairie are especially favored haunts. Several broods of young were observed in late May and early June. At such times they are often found in flocks as large as eight to sixteen. They eluded our pursuit by swiftly scurrying along the bushy borders of cypress 'heads.' The natives not infrequently capture the tender, half-grown young with dogs, and eat them with considerable relish. We were shown a hole in a dead pine on Billy's Island where both the Wood Duck and the Pileated Woodpecker had nested at different times. After the nesting is over and the young can fly, the Wood Ducks are said to betake themselves in considerable numbers to particular spots in the prairies, such as the southern part of Floyd's Island Prairie, where they associate with the Hooded Mergansers ('Frog Ducks'), but remain apart from the other Ducks of the fall and winter. The shrill little whistle of the male is very distinct from the louder and comparatively hoarse quack of the female.

3. **Guara alba.** WHITE IBIS; 'Curléw'; 'White Curléw'.—The White Ibis is reported as quite common in the swamp, but our own records are not numerous. Eight or nine birds were seen flying over the northern part of the swamp on May 8. On June 19 we observed three 'Curléws' flying high over Billy's Lake. A week later a flock of eight was flushed from a small pond on the outskirts of the swamp. During the last week of the party's stay, July 7-13, they became more common in the swamp itself. They breed in colonies with Egrets and other Herons. In 1910 they nested with Egrets on Minne's Lake. The following summer they resorted to the same place, but were fewer in number. For years they have roosted in cypress 'heads' on Floyd's Island Prairie, to and from which they were seen going morning and evening. These flocks are said to consist

sometimes of a single file of two or three hundred birds, while at other times they fly in a V-formation like Geese. The natives speak of 'Brown Curlews' which often fly and feed apart from the white forms. They also designate some brown and white ones as 'Pieded Curlews' or 'Black-pieded Curlews,' which roost with the other two. These are doubtless the younger phases of the one species. The hunters eat these 'Curlews' either 'stewed like chicken' or fried as are Wood Ibises.

4. **Mycteria americana.** WOOD IBIS; 'Flinthead'; 'Ironhead'; 'Mulehead'; 'Baldhead'; 'Wood Gannet.'—Fairly common. It is said that in dry weather the Wood Ibises occasionally resort to Billy's Island in flocks of one or two hundred. At such times the temporary pools in which killfishes are stranded prove enticing feeding grounds, as do the small cypress ponds on the islands. On May 30 two individuals were recorded flying over Honey Island, on the south edge of which the species has formerly roosted. On June 18 four of these remarkably fine birds circled and circled over a colony of Little Blue Herons, revealing from time to time in their turns the sheen of their backs. While a few were seen in May and June, they began in July to assemble in flocks. In descending the Suwannee on July 13, our party flushed flock after flock until 200 or more birds were sailing overhead. The members of the party observed that while rounding a bend in the river, they would hear a resounding noise like some one pounding on a hollow stump, and in every case the apparent cause was a Wood Ibis. The appearance of the birds when soaring very high in the air is Buzzardlike.

This species is considered a game bird, and is eaten whenever it can be secured. The native recipe is: 'Cut the breast crosswise; dip it in a little flour; wet it up; pack it; and then fry it.'

5. **Botaurus lentiginosus.** BITTERN; 'Marsh Hen.'—Uncommon. On June 17 we flushed our only 'Marsh Hen' along the Suwannee. It is said to frequent the prairies.

6. **Ardea herodias wardi.** WARD'S HERON; 'Po' Job'; 'Po' Jo'.—Fairly common. Generally distributed on the prairies and along the water-courses, and frequently seen flying over the wooded portions of the swamp. They were most common on Floyd's Island Prairie, where several were recorded on May 21 and 22, and a dozen more on June 25-27. This has been a favorite roosting place for several years. At dusk on June 25 and 26 we observed several birds coming into the prairie for the night. Here, on May 22, a nest with one well-grown young was located in a cypress 'head' some 60 or more feet above the water. Along the Suwannee River numbers were seen, and on June 18 several were found in a large colony of the Little Blue Herons on the west of the river. Here a nest was espied in a pine tree at least 70 or 80 feet above the water. The natives pronounced the 'Po' Job,' good eating; but when we tried a young one, all agreed that it was too bitter for our tastes.

7. **Herodias egretta.** EGRET; 'Plume-bird'; 'Big White Plume-bird'; 'White Crane.'—Formerly common. On May 20 Mr. Bryant Lee

found a number of these birds in a large colony of Little Blue Herons between Nixon's Ferry and Fargo. On June 18 three adults were observed at the same place and they proved fairly tame. Before the plume law of Georgia was enacted, hunters used to kill as many as 200 in a day in this resort. In 1910 there was a colony of 175-200 Egrets and White Ibises on Minne's Lake, and another of the same species and numbers was found in 1909 on the Big Water. On June 25 and 27 we saw two very shy Egrets flying over Floyd's Island Prairie. From July 7 to 12 a quartette of Egrets frequented a swampy bog between Gallberry and Billy's Islands. In the morning, even before daylight, our party always found them feeding in the bog, and in the evening, roosting in near-by trees. Although they were wild, and received considerable attention, they did not leave the place.

8. **Florida cærulea.** LITTLE BLUE HERON; 'Blue Scoggin.'—Common. A colony of several hundred birds was reported nesting in Cowhouse Bay in May. During this month a few adults and one immature bird were observed in the northern part of the swamp, and on June 27 several others were seen over Floyd's Island Prairie. Along the western borders of the swamp, in former years, there were two or three colonies of Little Blue Herons. One at Scoggin Pond was forsaken this year for the first time. Between Nixon's Ferry and Fargo there is another which is said to have been in existence for a long time. It was reported by Mr. Bryant Lee to contain about 500 nests with eggs and young on May 20. On our way to the same colony on June 18 we saw adults either coming or going almost every minute. The heronry is surrounded on three sides by a thin rim of pines, within which the squeaking, chickenlike calls of the young were heard. Here, in a swampy tangle where one goes waist-deep, the meager platforms of sticks are placed. The growth is mainly button-bush (*Cephalanthus occidentalis*), 'hurrah bush' (*Leucothoë racemosa*) and 'latherleaf' (*Clethra alnifolia*). The nests were from three to seven feet above the water; the average was four or five feet. At this season we found only half a dozen nests with eggs, and about as many more with young. All the other nests were empty, and many were more or less displaced. All about us were the white young in the higher bushes and pine saplings, some of which were bending beneath a load of ten to twenty birds. No more than six dead young were found in the whole heronry. From one position we could easily count 200-250 birds, of which only ten or twelve were adults. In all we saw 800-1000 young birds in this heronry, and no doubt many of stronger ones had left with the adults for the feeding grounds. On the previous day we had observed them on the Suwannee River. In the whole heronry we saw no more than three young in which the blue of the wings had begun to show. We learned on inquiry at the turpentine still three miles away that the negroes in former years used to gather the eggs in baskets for culinary purposes. It is almost equally certain that the birds were used for food. So far as we could determine, neither of these practices was indulged in this year.

9. ***Butorides virescens virescens***. GREEN HERON; 'Indian Pullet'; 'Indian Hen.'—Not common; much less numerous than either Ward's or the Little Blue Heron. A few were observed on the borders of the prairies and along the edge of Billy's Lake.

10. ***Nyctanassa violacea***. YELLOW-CROWNED NIGHT HERON.—Not until nesting was completed were any of these Herons seen. For several days (July 7-11) an adult and three young were watched in a cypress swamp near our camp. An adult and one young were taken at Billy's Lake on July 8.

11. ***Grus mexicana***. SANDHILL CRANE; 'Whooping Crane.'—These birds are fairly widespread in their distribution within the Okefinokee, which is one of their few remaining retreats east of the Mississippi. They have here lost neither their watchful alertness nor their keenness of vision. A number of our records were only musical memories. The birds were often flushed on the edges of the islands, where it was an easy matter for them to escape through the cypresses; in fact, if they had not announced their start, they might often have slipped away undetected. Their note is one of the finest sounds of the swamp. It is so unbirdlike, and yet rings so clear, is so far-reaching, and possesses such measured qualities, that the listener longs for an instant repetition. We found the Cranes on Billy's, Honey, and Floyd's Islands, and on Chase and Floyd's Island Prairies. We seldom observed them alone; they usually traveled in pairs or in parties of three or four. They are said to breed in the prairies, but at other times seem to prefer the pine woods with their growth of saw-palmetto and ericaceous plants. Here they find vast quantities of huckleberries, and are doubtless attracted also to pools where killfishes and tadpoles have entered at high water. We never realized what service their legs render them, until we winged one close at hand. All we ever saw of the bird after it alighted was a feather and some long strides in the sand. Unfortunately, the natives have a decided penchant for the 'Whooping Crane,' and never lose an opportunity to secure the 'fine eating' it affords them.

12. ***Aramus vociferus***. LIMPKIN.—On May 13 one or two individuals of this now uncommon species were observed flying over a prairie southeast of Honey Island. Its singular appearance on the wing and its weird cry were noted. It probably breeds here.

The records for Georgia seem to be very few. Its nesting in the state between the years 1853 and 1865 has been mentioned by H. B. Bailey (*Auk*, VII, 1883, p. 42). William Bartram, writing of his experiences on the Altamaha River in 1773 (*Travels*, 1791, p. 49), says, 'The crying-bird, another faithful guardian, screaming in the gloomy thickets, warns the feathered tribes of approaching peril.'

13. ***Actitis macularia***. SPOTTED SANDPIPER; 'Sweet.'—The Spotted Sandpiper was a distinct surprise as a summer resident of the swamp. Not only is this several hundred miles south of its known breeding range, but one would not expect it to find a suitable haunt in the Oke-

finokee. The lakes and runs are practically shoreless; they are simply open spaces in the otherwise continuous cypress swamps. However, the logs and driftwood near the edges of Billy's Lake serve as teetering stands; half a dozen were seen here on May 11, one on June 5, and still another a few days later. Earlier in the spring one or two were reported from the canal.

The species probably does not breed in this latitude. (See Wayne, *Birds of South Carolina*, 1910, p. 55.)

14. *Colinus virginianus virginianus*. BOB-WHITE; 'Partridge.'—Abundant in the pine barrens, both on the islands and in the country surrounding the swamp. A female taken on June 27 had in her crop seven grasshoppers, two snails in shells, two beetles, several spiders, one daddy longlegs, and numerous blueberries (*Vaccinium*). The oviduct of the same bird contained a fully formed egg. About the middle of May a nest with eggs was found by the natives on Billy's Island. They assert that Sparrow Hawks and probably wild cats prey upon the 'Partridges.'

15. *Meleagris gallopavo silvestris*. WILD TURKEY.—Rather scarce; more common in the country west of the swamp. It was formerly common in the swamp itself, but about fifteen years ago the decrease began to be perceptible, and the natives hold that it is due in part to the depredations of wild cats. The last Turkey was killed on Billy's Island about three years ago. A gobbler was flushed in The Pocket by a dog on June 26, and another was heard in the same place a year previously. On July 2 we heard a Turkey in the thick palmetto cover on one of the Minne Lake Islands.

16. *Zenaidura macroura carolinensis*. MOURNING DOVE; 'Turtle Dove.' Fairly common in the pineries about the edges of the swamp. It is said to occur sparingly on Billy's Island in the summer.

17. *Cathartes aura septentrionalis*. TURKEY VULTURE; 'Buz-zard.'—Common throughout the swamp. The natives have never found its nest. They told us, however, of several roosts, including one at Mud Valley (south of Billy's Lake) and another in the dead tops of some cypresses in a small 'head' on Floyd's Island Prairie. It is astonishing how soon the Buzzards appear over a spot where an alligator has been shot, and how quickly they transform its carcass into a bare skeleton.

18. *Catharista urubu*. BLACK VULTURE; 'Carrion (Cyarn) Crow.'—Not uncommon, but the preceding species outnumbers it by two or three to one. It is frequently seen associating on the wing with the Turkey Buzzard. The natives report that the two species also roost together, and that when a quarrel takes place, the Carrion Crow is always the overlord. The alligator hunters recognize the services of both birds in disposing of the offal in the vicinity of their houses and camps.

19. *Elanoides forficatus*. SWALLOW-TAILED KITE; 'Fish Hawk.'—Fairly common. Whenever these graceful birds appeared, it was an event worthy of attention. We seldom saw them coursing lower than the tree tops. Not infrequently they performed their easy gyrations as they passed over our camp, which was in a clearing. On one occasion a member of our

party saw a group of five birds turn repeated somersaults in the manner which Wayne has previously recorded (*loc. cit.*, p. 69). At another time we watched a pair ascend to a height thrice that of the tallest pines, when suddenly they shot headlong downward for some two or three hundred feet, halting on a level with the tree tops as quickly and easily as they began.

20. **Accipiter cooperi**. COOPER'S HAWK; 'Blue Darter.' One was observed on Honey Island on June 1.

21. **Buteo borealis borealis**. RED-TAILED HAWK; 'Rabbit Hawk.'—A pair were observed sailing over Floyd's Island on June 26. They were not sufficiently close to enable us to determine whether they were the typical species or *B. b. harlani*.

22. **Buteo lineatus alleni**. FLORIDA RED-SHOULDERED HAWK; 'Hen Hawk'; 'Chicken Hawk.'—Very common. This is one of the most widely distributed birds, as its scream is one of the most characteristic sounds, of the Okefinokee.

23. **Falco sparverius sparverius**. SPARROW HAWK; 'Tilly Hawk.'—Not common within the swamp. One or two were noted on Honey Island, May 13–15; here on June 1 we saw a nesting hole which was said to have been occupied earlier in the season. Another bird was observed on Cowhouse Island on May 23, and three more (including young of the year) on the outskirts of the swamp near Mixon's Ferry on June 17.

24. **Pandion haliaëtus carolinensis**. FISH HAWK; 'Fish Eagle'; 'Eagle.'—About fifteen Fish Hawks were noted. Their aeries usually occupy high and exposed situations in the prairie 'heads,' where they command views over wide expanses, and serve as landmarks. Of the six nests found, three were in pines on Honey Island Prairie; the other three, in dead cypresses on Floyd's Island Prairie, at the foot of Minne's Lake, and on Chase Prairie. They were situated from fifty to one hundred feet or more above the water. The only nest in a living tree was placed in the branches of a pine just below its large green top. The nest on Chase Prairie capped a huge cypress stump, and contained a well-grown young bird on May 17.

25. **Strix varia alleni**. FLORIDA BARRED OWL; 'Deer Owl'; 'Hoot Owl.'—Very common. Its deep, booming cry is sure to be heard at night, and is so characteristic of the Okefinokee that the natives use it as one of their signals when they are in trouble or far from home. The Barred Owl by night and the Red-shouldered Hawk by day furnish a round of weird and startling calls that one cannot soon forget. The former is a typical bird of the gloom-haunted cypress bays, the river bottoms of the Suwannee, and the small cypress ponds on the islands. It begins its calls in the late afternoon and continues them well into the evening. In the forenoon they may be heard until 9 or 10 o'clock, and occasionally throughout the hottest day. Several times its notes were uttered at midday when light rains were falling or impending. Besides its well-known resonant call, we heard a subdued, querulous note. The 'Deer Owl,' exhibit considerable curiosity; they responded frequently to poor imitations of their cry, and sometimes to the 'squeak.'

26. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO; 'Rain Crow.'—Common. These birds were observed or heard usually on the borders of the prairies, in the depths of the cypress bays, or on the river bottoms of the Suwannee, but were also found occasionally in the high pines on the islands. A pair was seen copulating on June 7 on Billy's Island, and the male was collected. Its stomach contained a larval giant silkworm. In a tupelo tree at the margin of the Suwannee, on June 17, we found a nest containing two eggs. It was placed in a cluster of mistletoe on a horizontal branch four feet above the water, and consisted of sticks interwoven with Spanish 'moss' (*Tillandsia usneoides*). It was the best example of a Cuckoo's nest we have ever seen.

27. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO; 'Rain Crow.'—A single bird, doubtless a migrant, was observed on May 8.

28. **Dryobates villosus auduboni.** SOUTHERN HAIRY WOODPECKER.—Not common in the swamp itself; more numerous along the Suwannee and in the pine lands on the outskirts of the swamp.

29. **Dryobates pubescens pubescens.** SOUTHERN DOWNY WOODPECKER.—Rather uncommon. They were seldom seen on the islands themselves, but usually in their cypress edges. Our records were made in the swampy woods along Minne Lake Narrows, Log River Narrows, and especially the Suwannee River.

30. **Dryobates borealis.** RED-COCKADED WOODPECKER; 'Sapsucker.'—Rather common in open pineries, both on the islands and outside of the swamp. On May 19 a bird was seen at its nest about thirty feet up in a pine on Billy's Island. On May 28, near Mixon's Ferry, we noticed another occupied nest some fifty feet from the ground.

31. **Phlœotomus pileatus pileatus.** PILEATED WOODPECKER; 'Kate'; 'Wood Kate'; 'Woodcock'; 'Good-God Woodpecker'; 'Lord-God Woodpecker.'—With the exception of the Red-bellied Woodpecker, this is the most abundant member of its family in the Okefinokee. In fact, we saw as many as four Pileated Woodpeckers in a single tree. In every part of the swamp—especially the cypress bays, but also the hammocks and the piny woods on the islands, and even the 'heads' on the prairies—these magnificent birds are at home. They are rather shy. On Billy's Island they usually left the open pine woods and sought refuge within the bordering cypresses, long ere we came within gun range. We frequently heard them giving their great and deliberate rolls in the thick bay surrounding Billy's Lake. Occasionally they flew across the lake from tree top to tree top, or disappeared at the other end of a 'bonnet' lagoon just as we rounded the corner. They were very common along the Suwannee, where we several times endeavored to surprise them at work, but the slightest noise caused them to slip away farther into the depths of the forest. An unsuspecting pair of 'Kates' in a swampy thicket is a glorious spectacle; with their scarlet crests erect, they are the very embodiment of all that is wild. The birds are noisiest at sunrise, but their high-pitched, Flicker-like notes resound through the swamp at all times of the day.

32. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER; 'White Shirt'; 'Jerry Coat'; 'Shirt-tail.'—Not common. It was recorded on Honey Island, May 13-14 and June 1; at the Minne Lake Narrows, June 25; and on Floyd's Island, June 25.

33. **Centurus carolinus.** RED-BELLIED WOODPECKER; 'Sham-shack'; 'Ram-shack'; 'Chad-cherries.'—Abundant throughout the wooded portions of the swamp, in both the pines and the cypresses. Of the two habitats, they were recorded more frequently in the pines. In the partially cut pine lands about the swamp they were in equal abundance. On May 11 a bird was observed at its nest, which was at a height of about 35 feet in a dead pine on Mixon's Hammock. A male taken on June 8 had been eating blueberries and buprestid beetles. The 'Sham-shack' has a variety of call-notes, which it utters frequently; the commonest one has doubtless given rise to the local names.

34. **Colaptes auratus auratus.** FLICKER; 'Yellow-hammer.'—Not very common on the islands. More numerous in the country surrounding the swamp.

35. **Antrostomus carolinensis.** CHUCK-WILL'S-WIDOW; 'Whip-poor-will.'—Uncommon in the swamp. Only one was recorded within the swamp during our stay; it was heard on Billy's Island on June 19. Earlier in the spring two or three were noted by the natives. Between Mixon's Ferry and Fargo the birds were found to be very common.

36. **Chordeiles virginianus virginianus.** NIGHTHAWK; 'Bull Bat.'—Several Nighthawks were reported on Honey Island Prairie on the evenings of May 30 and 31. Beyond the borders of the swamp the birds are very common. They were noted on the northern side on May 3, 6, 8, and 23, and along the western margin on June 17, 18, and 23.

37. **Chætura pelagica.** CHIMNEY SWIFT; 'Chimney Swallow'; 'Chimney Sweeper.'—Common. Most of our observations were made over the lakes or the prairies. The birds were frequently noticed skimming the lakes at midday in the hottest sun. They are found in the most remote parts of the swamp, many miles from any human habitation, and must make use of hollow trees as nesting sites. The Lees assert that the 'Chimney Swallows' do not use the chimneys of their cabins, and yet the Swifts course commonly enough over the near-by fields.

38. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.—Not common. A few birds were observed about the dwellings on Billy's Island, especially at the crape myrtle ('lady's-streamer') bushes in one of the yards. Another was seen near the head of the Suwannee River on June 19.

39. **Tyrannus tyrannus.** KINGBIRD; 'Bee-bird'; 'Bee Martin.'—Very common on the prairies and islands, as well as on the outskirts of the swamp. On June 18 young were on the wing. On Honey Island we saw a 'Bee Martin' pursue a Sparrow Hawk and a Turkey Vulture, and on Floyd's Island, a Red-tailed Hawk.

40. **Myiarchus crinitus.** CRESTED FLYCATCHER; 'Yellow-tailed Bee-bird'; 'Yellow-tailed Bee Martin.'—Abundant. This bird is found

in every portion of the swamp and surrounding country. In fact, only the Red-bellied Woodpecker can compare with it in numbers and in wide-spread distribution. On May 28 we noted a nesting hole thirty feet up in a pine tree, whither the parents were carrying food.

41. **Myiochanes virens.** WOOD PEWEE.—Rather common. It seems to prefer the pines on the islands to any other environment within the swamp. In only a few instances was it observed among the cypresses.

42. **Empidonax virescens.** ACADIAN FLYCATCHER; 'Tick-bird.'—Common. This Flycatcher finds a congenial haunt in the gloom of the cypress 'bays,' where one often hears its note as he paddles along the narrow runs. It also frequents the hammocks and the cypress ponds. Within these shady retreats it appears unmindful of the summer temperature, and continues to utter its energetic call throughout the warmest and brightest days. A nest was discovered north of Billy's Lake on May 20; it was placed on a limb of a cypress sapling about ten feet above the water, and contained two eggs.

43. **Cyanocitta cristata florincola.** FLORIDA BLUE JAY; 'Jay-bird.'—Not very common. All of our records are restricted to the larger pine islands — Billy's, Honey, Floyd's, and Minne Lake Islands. A male and a female taken on June 7 had only blueberries and huckleberries in their stomachs.

44. **Corvus ossifragus.** FISH CROW.—Uncommon. A few were noted along the canal, May 17-18. The scarcity of Crows is a very noticeable and gratifying feature of Okefinokee bird life.

45. **Dolichonyx oryzivorus.** BOBOLINK.—Observed as a late migrant in May: a flock of 10, Billy's Island, May 9; a flock of 40 along the canal, May 17; and a male and a female on Floyd's Island Prairie, May 22.

46. **Agelaius phoeniceus floridanus.** FLORIDA RED-WING; 'Rice-bird.'—Common on the prairies in the northern portions of the swamp. On the prairies south of Honey Island they were not so common, only a few being seen on June 1 and 2. Along Billy's Lake and the Suwannee none were observed. The only place where we found them in wooded parts was the 'bay' beside Minne's Lake, which is not far from prairies on the east. On May 8 a nest with several eggs was found between Cowhouse Island and the Big Water. On May 21 two more nests with three eggs each were located on Floyd's Island Prairie.

47. **Sturnella magna argutula.** SOUTHERN MEADOWLARK; 'Field Lark'; 'Lark.'—Common in the pine barrens on the islands, and in the country surrounding the swamp. Open as the woods are, one can hardly become accustomed to the presence of the birds in a forested haunt. Some of their notes, too, have a quality that sounds strange to one familiar with the northern bird. On Honey Island we found young on the wing by June 1. The natives do not consider this a beneficial species.

48. **Icterus spurius.** ORCHARD ORIOLE.—A few were noted in the region beyond the northern border of the swamp: Hebardville, May 4, 5, and 24; Braganza, May 23.

49. **Quiscalus quiscula aglæus**. FLORIDA GRACKLE; 'Black-bird.'—Common. Within the swamp this species seems to show a decided preference for the cypress ponds on the larger islands and for the cypress heads on the prairies. It was also recorded frequently on the outskirts of the swamp. The birds were generally observed in small flocks, some of which numbered as many as fifteen individuals.

50. **Peuceea æstivalis æstivalis**. PINE-WOODS SPARROW.—Common in the pine barrens, both on the larger islands and in the environs of the swamp. It is apparently the only Sparrow that breeds in the Okefinokee. It is emphatically a bird of the forest floor, seeking cover in the undergrowth of blueberries and saw-palmettoes, whence it reluctantly flushes to take a perch in a near-by pine. At daybreak it is one of the first birds to begin singing.

51. **Pipilo erythrophthalmus alleni**. WHITE-EYED TOWHEE; 'Joe.'—Fairly common among the saw-palmettoes on the islands; here it was observed in several instances close to the borders of small cypress ponds. A nest was found in such a situation on Billy's Island on May 10; it contained three young and one egg. The birds are more numerous beyond the western border of the swamp.

52. **Cardinalis cardinalis cardinalis**. CARDINAL; 'Redbird (with black chin).'—Fairly common in the cypress 'bays' along the lakes and watercourses, in the hammocks, in the cypress heads on Honey Island Prairie, and in swampy spots on the outskirts of the swamp.

53. **Piranga rubra rubra**. SUMMER TANAGER; 'Redbird (without black chin).'—Fairly common in the pines on Billy's Island, but not found elsewhere in the swamp except on Floyd's Island, where one or two were recorded. Several were observed on the western border of the swamp. Its song is a rich, dignified effort, considerably sweeter than that of the Scarlet Tanager. The stomach contents of a male taken on June 8 consisted of insect remains, all apparently Hymenoptera.

54. **Progne subis subis**. PURPLE MARTIN; 'Martin.'—A number of Purple Martins were observed at their gourd nests at Hebardville, May 4 and 5; at Braganza, May 8 and 23; and on the western edge of the swamp, May 30. The family on Billy's Island also kept Martin gourds in former years, but none of the birds were found this season within the swamp.

55. **Lanius ludovicianus ludovicianus**. LOGGERHEAD SHRIKE.—One was observed on May 5 at Hebardville, and another on May 8 at Braganza. The first bird was seen to chase a Red-cockaded Woodpecker for a considerable distance, and the fresh remains of one young and one adult Bluebird on a near-by stump offered further evidence of the Loggerhead's rapacity.

56. **Vireosylva olivacea**. RED-EYED VIREO.—Uncommon. Noted several times in the hammock growth on Billy's Island and twice on the northern side of the swamp.

57. **Vireo griseus griseus**. WHITE-EYED VIREO.—Fairly common in the densest tangles of undergrowth in the cypress 'bays.' Though it sings

most frequently in the early morning, even the extreme heat of midday does not deter this most versatile of our Vireos.

58. **Protonotaria citrea.** PROTHONOTARY WARBLER.— Abundant throughout the cypress 'bays,' where it is one of the most characteristic forms. The birds were observed most frequently at the edges of the growth along the watercourses, such as Billy's Lake and the Suwannee River. They repeatedly fly back and forth across the lake, and the male occasionally gives a spirited and surprising flight song. The Prothonotary appeared more responsive to the 'squeak' than any other bird of the swamp.

Four nests were found: one with four eggs, May 10, in a low stump in a cypress pond on Billy's Island; another with four fledglings, May 16, in a cavity of a small tree, about three feet above the water, Billy Island Bay; a third with several eggs, May 18, in the broken top of a living black gum sapling, about five feet above the water, Billy Island Bay; and, finally, one with four eggs, June 8, about ten feet up in a cypress on Billy's Lake. In each case the nests were not in deep holes with narrow openings, but in open cavities where the eggs or young could be plainly seen.

Several hours were spent on May 19 in an umbrella blind beside the first-mentioned nest, which then contained young. For the first hour or so the parent birds did not venture to the stump, but remained in the vicinity, frequently uttering a nervous *chip*. The male also sang occasionally. Finally he showed himself the more courageous or unsuspecting of the two, for he fed the young several times before the female came.

59. **Helinaia swainsoni.** SWAINSON'S WARBLER.— To find that this famed and elusive Warbler is a not uncommon inhabitant of the deep Okefinokee thickets, was one of the rarest pleasures of our sojourn in the swamp. We recorded it in the 'bay' on both sides of Billy's Lake, in the tangled growth along the west fork of the canal, in Billy Island Bay, on the edge of Mixon's Hammock, in the canebrake of Floyd's Island Hammock, and finally in some of the wildest and densest cypress woods of the swamp, between Minne's Lake and the Minne Lake Islands. Here on June 13 and 14, while lost and camping 'on top of the swamp,' we had a good chance to make its acquaintance. The song began early in the morning, continuing frequently until about 7 A. M., and at longer intervals for another hour or so. Thereafter it was heard only occasionally until late afternoon, when it began again to be given more regularly.

Swainson's Warbler remains under the close cover of the thicket's interior, and in order to secure a glimpse of it, one must push his way through a tangled barrier of bushes, vines, and thorns. But stalking alone will scarcely suffice. After cautiously approaching the spot whence the song seemed to come, we generally resorted to the 'squeak,' and in this way succeeded more than once in luring the singer to within a very few yards of us. On one occasion, when the 'squeak' failed, an imitation of the song itself immediately brought the desired effect.

60. **Compsothlypis americana americana.** PARULA WARBLER.— Abundant. Widely distributed in the swamp, but found in greatest num-

bers in the cypress 'bays,' where the luxuriant growth of *Tillandsia* provides the Parula with an ideal habitat. Young birds on the wing were seen at Minne's Lake on May 20.

61. **Dendroica striata.** BLACK-POLL WARBLER.— One or two migrants were observed along the canal on May 18.

62. **Dendroica dominica dominica.** YELLOW-THROATED WARBLER.— Rather common. We recorded it not only in the 'bays' and prairie 'heads,' but in the pine barrens as well. Although it usually remains high up in the tallest trees, it was also observed in the lower growth close to the water or the ground.

63. **Dendroica vigorsii.** PINE WARBLER.— Fairly common in the pine barrens within and without the swamp. We were surprised to find these birds also in considerable numbers among the cypress 'heads' of Honey Island Prairie.

64. **Geothlypis trichas ignota.** FLORIDA YELLOW-THROAT.— Quite common. Yellowthroats are found in and about the cypress ponds on the islands, in the 'heads' and along the borders of the prairies, and even far within the depths of the flooded cypress 'bays.' Along the run through the 'bay' between Billy's and Minne's Lakes several were brought into view by the 'squeak.'

65. **Wilsonia citrina.** HOODED WARBLER.— Fairly common. It was found usually in thickets and swampy places along the borders of the islands. The haunts it affects in the Okefinokee are much like those of Swainson's Warbler, although the latter seems to keep more closely, as a rule, to the wetter situations. Both species were observed in the same canebrake on Floyd's Island Hammock, the Hooded Warbler on the inner edge, and the Swainson's on the outer edge bordering the swamp.

66. **Setophaga ruticilla.** REDSTART.— A migrant was noted along the canal on May 18.

67. **Mimus polyglottos polyglottos.** MOCKINGBIRD.— Uncommon within the swamp, but common in its environs. No Mockingbirds were found in the interior in the summer of 1912, although one or two pairs generally nest on Billy's Island. They are also said to have been observed in numbers along the Big Water.

68. **Toxostoma rufum.** BROWN THRASHER.— A few are found on the islands in the swamp. On June 26 one was observed on Floyd's Island, and another was seen on Billy's Island. Several were recorded beyond the swamp borders.

69. **Thryothorus ludovicianus ludovicianus.** CAROLINA WREN.— Very common in all wooded parts of the swamp — in the pine barrens, along the watercourses, in the deepest and thickest 'bays,' in the hammocks, and on the isolated prairie 'heads.' The Wrens were ever present and constantly heard, yet rarely seen. On May 30 we appropriated an old cabin in which a pair had a nest with four eggs, but seldom indeed did any of us actually secure a good view of either parent. On May 4 a nest with five eggs was found at Hebardville. The young birds of another

nest, which was built in a corner on Billy's Island, left it about May 19. Many a curious call which we heard in the swamp and traced to its source, proved to be simply another note of this accomplished Wren.

70. ***Sitta carolinensis atkinsi***. FLORIDA WHITE-BREADED NUTHATCH; 'Tomtit.'—Rather common in the pine barrens, and occasionally recorded in the 'bays' and hammocks. More common in the open border land on the west of the swamp.

71. ***Sitta pusilla***. BROWN-HEADED NUTHATCH; 'Tomtit.'—Very common in the pine barrens, but not confined to this habitat, for, strangely enough, we found numbers of these Nuthatches among the cypress 'heads' of Honey Island Prairie. As they hasten about in small companies, flitting among the pine needles, they keep up an incessant conversation with their dainty notes. In habits and notes they resemble the Titmice as much as they do the other Nuthatches.

72. ***Bæolophus bicolor***. TUFTED TITMOUSE.—Rather common. Within the Okefinokee the Tufted Tit seems to be confined pretty closely to the swampy thickets and 'bays,' such as those surrounding Billy's Lake and bordering the Suwannee River. The birds are much given to answering each other with their loud, clear whistles, and they sometimes utter a note that is Oriolelike in quality. We found a whole family giving their Chickadeelike note as they were feeding along the edge of Mixon's Hammock.

73. ***Penthestes carolinensis carolinensis***. CAROLINA CHICKADEE.—Fairly common. A few Chickadees were found in the prairie 'heads'; some were recorded in the cypress ponds on the islands and in small wet areas on the outskirts of the swamp; but most of our observations on this species were made along the lakes and watercourses. Several times the birds were noticed in groups of three or four individuals.

74. ***Hylocichla mustelina***. WOOD THRUSH.—On May 9, and again on May 16, a bird was heard singing in the border of the swamp at the north end of Billy's Island.

75. ***Sialia sialis sialis***. BLUEBIRD.—One of the most pleasing features of the bird life of the pine barrens is the presence of the Bluebirds in considerable numbers. A nest with young was located in a stump just off Honey Island, in the edge of the prairie, on May 13, and by June 1 young were found on the wing on this island. As late as June 18, however, birds were still nesting at Mixon's Ferry.

SUPPLEMENTARY LIST.

In view of the impending destruction of primeval conditions in the Okefinokee and the uncertainty of our making future visits to the region, it seems desirable to give at the present time as complete an account as possible of the bird life of the swamp. For this

reason the following supplementary list has been prepared. It includes the species that did not come under our own notice, but concerning which we received definite information from persons living in and about the swamp, particularly the Lees of Billy's Island. The reliability and the accuracy of these people was so amply manifested on frequent occasions that we feel no hesitation in vouching for their observations.

1. **Podilymbus podiceps**. PIED-BILLED GREBE; 'Diedapper.'— Uncommon. It occurs mainly on Floyd's Island Prairie and on the Big Water in the winter time.

2. **Phalacrocorax auritus floridanus**. FLORIDA CORMORANT.— Seen occasionally in fall and winter.

3. **Lophodytes cucullatus**. HOODED MERGANSER; 'Frog Duck.'— Common winter visitant. Sometimes it is found with the Wood Ducks on the prairies.

4. **Anas platyrhynchos**. MALLARD; 'English Duck.'— Common fall and winter visitant. The natives pointed out the hard seeds of bladderwort (*Utricularia purpurea*) as a favorite food of the Mallards and other winter Ducks. They have a 'roosting place' in the most open part of Floyd's Island Prairie.

5. **Ajaia ajaja**. ROSEATE SPOONBILL; 'Pink Curlew.'— Col. A. B. Perram, of Waycross, informed us that some years ago a well-known hunter by the name of Craven brought to his office some 'Pink Curlew' feathers from the Okefinokee. The Lees have never met with this species in the swamp.

6. **Egretta candidissima candidissima**. SNOWY EGRET; 'Egret.'— A plume-bird, called the 'Egret,' was found in the swamp twenty years ago. It was 'smaller than a White Crane, about the size of a Blue Scoggin, or larger than an Indian Pullet. Its plumes were curved, and not so long as those of the White Crane.

7. **Nycticorax nycticorax nævius**. BLACK-CROWNED NIGHT HERON; 'Redeye.'— We were told of another Heron, called the 'Redeye,' which is found in the swamp. The general description of the bird tallied well with the appearance of the Black-crowned Night Heron, and the local name is certainly appropriate.

8. **Ionornis martinicus**. PURPLE GALLINULE.— Mr. John M. Hopkins, of Hebardville, reports taking one in the swamp some years ago. The Lees probably refer to this species when they speak of 'a long-legged bird, purplish blue in color, with a red spot on the front of the head.' It is found on the prairies in the fall.

9. **Fulica americana**. COOT; 'Blue Pete.'— In the fall and winter the Coot is found on the prairies, and also among the bonnets and other aquatic vegetation of Billy's Lake, where as many as a hundred have been seen at a time.

10. **Philohela minor.** WOODCOCK; 'Snipe.'— It is not very common, but probably breeds here.
11. **Chamepelia passerina terrestris.** GROUND DOVE; 'Mourning Dove.'— Rare. One or two are usually noted each year on Billy's Island.
12. **Circus hudsonius.** MARSH HAWK; 'Goshawk.'— We were told of a large, white-rumped Hawk, which courses low over the prairies and islands, and feeds on snakes and frogs. It goes by the name of 'Goshawk.'
13. **Haliaeetus leucocephalus leucocephalus.** BALD EAGLE.— Occasional. It apparently does not breed here.
14. **Otus asio floridanus.** FLORIDA SCREECH OWL; 'Scrich Owl.'— Found in small numbers in the swamp.
15. **Bubo virginianus virginianus.** GREAT HORNED OWL; 'Horned Owl.'— This is the least common Owl in the Swamp. It is occasionally noted on the prairies south of Honey Island, where one was heard during the middle of the night of May 30. It is also reported on Floyd's Island. The last specimen taken on Billy's Island was caught in a trap some ten years ago, after it had been stealing chickens.
16. **Ceryle alcyon alcyon.** KINGFISHER.— Not common in summer; more numerous in winter. On June 16 one was seen on the Suwannee River below Mixon's Ferry. Several others were recorded on Billy's Lake during June.
17. **Campephilus principalis.** IVORY-BILLED WOODPECKER.— Rare, but still existent in small numbers in the northwestern part of the swamp. The center of their distribution seems to be the group of Minne Lake Islands, which occupy an almost inaccessible position within the depths of the immense cypress 'bay' west of Minne's Lake. The natives seldom visit these islands without hearing or seeing the Ivorybills. We made three distinct efforts to reach the locality, but only on the last trip did we succeed. Then we were shown three former nesting sites of this species: the first nest, which was found occupied some six years previously, was high up in a dead cypress standing in a pondlike area near the south end of Long Island; the second was discovered about ten years ago in a large red bay in the midst of a dense cypress tangle some distance from the edge of Camp Island (upon which the Jackson Survey party camped, and hence the name); the third site was in a dead cypress in a little 'alligator lake' near the north end of Camp Island, and was occupied three or four years ago. Our guide heard an Ivorybill within the swamp beyond the last site, but the rest of our party on this short trip were not fortunate in either seeing or hearing it. The feeding range of the Ivorybills appears to be very restricted, for only on rare occasions have they been recorded as far away as Minne's Lake and Billy's Lake.
18. **Dumetella carolinensis.** CATBIRD.— This species is sometimes found in the swamp.
19. **Planesticus migratorius migratorius.** ROBIN.— Numbers come here during the winter, and occasionally a bird is seen in the summer.

We were disappointed in our hope of hearing something of old records of the Carolina Paroquet. Among the present inhabitants there seems to be not even a tradition of its occurrence in the swamp, which lies well within its former range.

NOTES ON OFFSHORE BIRDS.¹

BY JOHN TREADWELL NICHOLS.

DURING a number of years past, the writer has had opportunity to make observations from time to time on sea birds off our coast from Cape Cod southward, which, though fragmentary, yet seem worth recording in view of the scant opportunity of ornithologists to make such observations, and the consequent paucity of our knowledge of these birds.

On December 22, 1900, he sailed east-southeast from New York on a merchant sailing ship. As the coast was left behind, a few Kittiwake Gulls (*Rissa tridactyla tridactyla*) still were seen daily in varying numbers, the last being recorded January 5, 1901, 25° 57' North 37° 43' West, 2360 sea miles² east of Miami, Florida, 1350 west of the African coast, 660 further south than the species occurs on our Atlantic coast.³

On January 1, 1905, the writer was on a freight steamer off Cape Cod, making the trip from New York to Boston. A single Gannet (*Sula bassana*) seen flying close to the water off the back side of the cape is a far northern winter record for this species, which very rarely occurs as far north as New York in winter. Dovekies (*Alle alle*) were numerous, sitting on the water. As the steamer's bow approached, they would sometimes flutter along the surface, then dive below it and swim off rapidly, using their short wings as

¹ The first part of this paper was read before the Nuttall Ornithological Club.

² Distances throughout this paper are approximate, in sea miles.

³ See Bennett, *Bird-Lore*, VIII, 1906, p. 90.

The theory that the same individual sea birds, Gulls, Albatrosses, or Petrels, follow a ship day after day, is in the writer's opinion fallacious.

paddles. Kittiwakes were common, and flocks of Eider Ducks were seen about off Monomoy.

On August 7, 1906, sailed east-southeast from New York on a sailing ship. When well to sea Wilson's Petrels (*Oceanites oceanicus*) became numerous and remained so across the Gulf Stream, but had disappeared entirely before reaching 38° North 64° West on August 11, a point 335 sea miles southeast of Nantucket. A single Limicoline bird came about the ship on August 9, 39° 40' North 70° 14' West and again one on August 12, 37° 02' North 59° 27' West, and it was interesting to see this bird east of the Petrels. A broad, almost birdless area of ocean, where Kittiwake Gulls had been seen in winter five years previous, was now crossed. The first three or four days of the voyage a few Swallows were seen, the last surely identified as such on August 9, 39° 40' North 70° 14' West, 90 sea miles south of Nantucket, the nearest land. The record is of interest in view of the irregular occurrence of migrant Swallows in Bermuda.

In summer time, especially after a period of foggy weather, Wilson's Petrels often become very abundant close to shore off New York, and enter New York harbor.

On February 17, 1912, left New York for Havana, Cuba, by sea. The coldness of the passing winter was evidenced by two Holbøll's Grebes (*Colymbus holbøllii*) in New York harbor. Other birds of consequence were not observed until the second day, approaching Cape Hatteras, where we crossed from the shallow, cold green water to the north, to the deep, warm blue water with gulf weed to the south. Just north of this line, over the green water, the air was full of haze, and in the haze birds were numerous. There were Red-throated Loons (*Gavia stellata*), Gannets (*Sula bassana*), flocks of medium sized Alcidæ (unfortunately not identified), a few Horned Grebes (*Colymbus auritus*), and two Dovekies (*Alle alle*) were seen. On passing south onto the blue water, all these birds disappeared. A dwindling flock of Herring Gulls (*Larus argentatus*) still followed the ship, and an occasional Herring Gull was observed even from the north shore of Cuba. On February 19, 30° North 77° West (230 miles east of Saint Augustine), steaming through a wonderfully smooth sea, an Audubon's Shearwater (*Puffinus lherminieri*) appeared gliding close to the water, gave

its stiff, narrow wings a few quick flaps, and slid out of sight behind a swell.

Coming north from Havana, Hatteras was passed after dark, so that the bird life there was not observed except that Herring Gulls became tolerably common and three Gannets were seen on blue water with gulf weed just south of that cape. March 11, 32° 30' North 77° 00' West (145 miles east of Charleston) several Puffinidæ, about ten in all, were seen. They were wild and none came near enough to the steamer for a satisfactory view, but they were noted as probably Greater Shearwaters (*Puffinus gravis*) and I marvelled greatly that this species should be found off Hatteras at a season when it would have been expected to be just finishing its breeding in the southern hemisphere. In the light of later observations, these birds were very likely the Black-capped Petrel.

January 23, 1913, left New York for Havana by steamer. It was interesting to contrast the birds of an unusually warm winter with those observed in 1912. A single Bonaparte's Gull (*Larus philadelphia*) was seen in New York harbor, and two Gannets were observed outside, the first probably about ten miles south from Sandy Hook. On the Cape Hatteras grounds Gannets were numerous, but a single Loon and perhaps one or two Alcidae were in contrast to the many birds seen here the year previous. Herring Gulls also were not noted as far south, the last being seen the day Hatteras was passed. On January 25, 31° 48' North 75° 58' West (250 miles east of Savannah), on blue water, alternating sunny and showery with a little lightning, the steamer butting into a brisk southwesterly breeze, a sharp lookout was kept for Puffinidæ, as they had been seen near this latitude the year before. Once or twice thin vanishing vertical shadows against the myriad horizontal wave shadows of the distance lead me to believe there were some of these birds about, and as I stood by the port side forward, looking towards the bow, a Black-capped Petrel (*Estrelata hasitata*) darted away to the eastward above the waves, and I had a splendid view of its long, narrow, stiff wings, blackish cap and back, black tail, white side of neck underparts, lining of wings and upper tail coverts. First one then the other wing uppermost, it was shooting across the wind with almost unbelievable speed and soon out of sight among the distant seas. An Audubon's Shearwater, which

appeared in the trough of a sea near the vessel almost immediately, was noticeably smaller than the first bird. Two or three other birds, obviously Puffinidæ, were seen later in the day, but these were the only ones which came within fair binocular range. The flight and appearance of the Black-capped Petrel were very much like those of the Greater Shearwater. The distinguishing large amount of white over the tail was conspicuous.

January 26, 27° 18' North 79° 40' West, approaching the Florida coast, two or three Audubon's Shearwaters were seen; and January 27, 24° 20' North 81° 10' West, crossing from Florida to Cuba, they were common, but none were seen on the Cuban side of the Straits. I quote from my notes, "Blue water; practically no gulf weed. Wind moderate, 45° on our port bow. The Shearwaters were mostly flying parallel with the ship at about her speed, off her leeward bow. They crossed the bow from time to time and flew up to windward; apparently they had been flying into the wind, planning to pass in front of the ship, and did not allow for her progress. None were seen behind the ship or amidships to windward. They flew very close to the water, flapping a great deal, the sails much abbreviated. Sometimes one would half light and, with wings extended, kick itself into the air again with its feet against the water. Their rather long tails were noticeable.

Coming north from Santiago de Cuba on February 1, passing the Bahamas, a single Tropic Bird was seen 24° 40' North 74° 30' West, and two or three Puffinidæ in the distance were probably Audubon's Shearwater. February 2, 28° 35' North 74° 35' West, cloudy with fresh east-northeasterly wind, blue water and gulf weed, by watching diligently saw one Black-capped Petrel (*Estrelata hasitata*) which flew along with the vessel for a few minutes off her starboard quarter. It resembled the one seen on January 25, but was not so close to the ship. Noted the white underwing surfaces, long wings, and conspicuous white wedge of the upper tail coverts. The first Herring Gull appeared February 3, 33° 45' North 74° 35' West, but these were not common until the next day. We were coming north further off shore than the Havana route, which perhaps accounts for the fact that a number of Kittiwakes (*Rissa tridactyla tridactyla*) were seen February 4, in the morning, 37° 46' North 74° 10' West (85 miles east of Maryland). They were absent after that until about sunset, when we were getting close

to New York, and a few of these gulls as well as several Gannets and one or two Dovekies were observed.

The following seem to be the most noteworthy generalizations which can be made from these fragmentary observations:

The Kittiwake Gull (*Rissa tridactyla tridactyla*) winters at sea across the mid-Atlantic, much farther south than on our coast, where it is found in numbers only as far south as New York, and probably a few to Hatteras.

The Gannet (*Sula bassana*) winters as far north as the Hatteras grounds and northward in diminishing numbers; very rarely to New York, stragglers sometimes off Cape Cod.

The Audubon's Shearwater (*Puffinus lherminieri*) occurs commonly off our southern states in winter, not far south of its coast-wise summer range.

The Black-capped Petrel (*Æstrelata hasitata*), is not extinct and occurs off our southern states, observed in winter northward and eastward of the Audubon's Shearwater.

Alcidæ and Red-throated Loon (*Gavia stellata*) in severe winters occur south off the coast in numbers to the Hatteras grounds; in open winters they are less plentiful southward.

The Problem of the Sailing Bird.

There has been some discussion of late as to what forces are utilized by the sailing bird and how they are utilized, perhaps sufficient to serve as excuse for offering the following explanation here, even though, being in the writer's opinion the true one, and quite simple, it very probably has often been stated before.

Let us take a simple, striking case of the phenomenon, and one not complicated by local conditions as cliffs or mountain ranges and their accompanying vertical air currents. An Albatross has been resting on the water during a calm spell (as is the custom with these birds); when a fresh wind springs up he launches himself in the air with much flapping and kicking of the water (again customary) and when well started, sails across the wind on stiff, motionless wings (again customary).¹ His wings are tremendously long and narrow; his big feet extended backward reach just beyond

¹ See Fisher, Bull. U. S. Com. Fish. for 1903, p. 23. The apparent difficulty of the Albatrosses here discussed to cross the wind may rather be explained as difficulty of turning short into or loss of relative momentum before it.

the end of his stumpy tail, which seems not to balance his big neck and shoulders. As he goes he leans far over, first to one side, then to the other. Now the tip of his lower wing actually cuts a knife-like furrow in the water, now he swings high into the air on a great bow. At first sight you say, of course the wind is the motive and supporting force. But on trying to explain how it is such, difficulties are apt to be experienced, and you would perhaps fall back on the theory that the bird utilizes rising air currents, except that this theory *does not satisfactorily explain the observed facts*, for the bird seems to go where it chooses and everywhere find the right air currents. So universal a distribution of rising currents will not meet the test of probability. It is believed that the difficulties spoken of come from trying to apply the force of wind always to the under side of the bird's wings and to brace it against gravity, whereas in fact it is commonly applied to the upper surface in gaining momentum. In order to use this force, the bird must oppose it to a comparatively rigid resistance, as that of the water against the flat side of a sailboat's hull. In the compressed air beneath him he finds just such a force, familiar enough to us as holding up parachutes etc., and it is significant that the sailing Albatross holds its wings somewhat downward, which would help them to function as a parachute. By raising or lowering and turning his head, he may steer readily with this bow rudder and maintain or increase his elevation by directing his course slightly upward through the air. It is an observed fact that he turns toward his lower wing, and doubtless leaning to the side is the important factor in steering to one side or the other. When his course is held upward by pressure of air on his breast and lower head, and at the same time he is being propelled forward by pressure on the upper side of his wings, obviously a very long wing is an advantage, which we find to be the type of wing possessed. It will be noted by our hypothesis that all forces being braced against the upward parachute pressure of the air beneath the bird's wings, the downward pressure opposed to it must be considerable, and the density of the air increasing with the pressure, the sailing bird rests on an invisible cushion of dense, compressed air. As he moves forward, fresh air is feeding into this cushion in front and an equal amount escaping from it behind, but the current through it is slight as in a lake though with inlet and outlet. Braced against this air cushion, the

Albatross can maintain his momentum by utilizing gusts of wind, merely turning his upper surfaces to its impact, or swooping down from time to time. If by inadvertence he does lose this momentum,—begin to drift (frequently observed in light and moderate breezes)—he can readily regain it by a few flaps of his wings (commonly observed in such cases). Care should be taken not to consider the upward parachute pressure of the air a force, for it is a resistance, not to confuse it with the pressure of the wind, and not to draw false analogies between an object in compressible air and one in non-compressible water. The above hypothesis will explain sailing close to the wind as well as across it. There are doubtless complications and adjustments which it does not cover, just as sailing birds doubtless experience and utilize more or less vertical currents which may at times make easier, but do not in general explain their sailing. It is also a conservation hypothesis in that it allows for a bird's shooting a long distance in still air by utilizing, instead of opposing, its elasticity.

As corollary we would expect Albatrosses, Shearwaters, circling Gulls and Hawks to attain their greatest velocity with their upper surfaces inclined to the wind. That my memory fails me as to whether or not they do so, shows how meager our observations often are without a theory to direct them. In a way it is an advantage to draw up the hypothesis without these observations, as then when made they will be new facts to test it by.

The compressed air hypothesis does not preclude a bird's being lifted by the wind below its wings while losing momentum, nor of its attaining momentum by being braced upward against the air pressure, if its wing be flat and firm enough to meet perpendicular resistant air pressure above, which the wings of most birds probably are not, though quite capable of utilizing the glancing impact of the wind. A bird with a wing which would admit of the former would be expected, in its ordinary flapping flight, to raise its wing edgewise, turn it and bring it down flatwise. It is possible that Shearwaters do fly somewhat in this manner, and that it explains a certain stiffness which has been observed in their motions.

In conclusion it is quite possible for a bird to utilize the wind by bracing it against more or less vertical air pressure, and vertical air currents are unnecessary as they are ineffectual in explaining its sailing.

MORNING AWAKENING AND EVEN-SONG.

SECOND PAPER.¹

BY HORACE W. WRIGHT.

So interesting had the procuring of definite data upon the subject of morning awakening and even-song become, that I was again moved in the season of 1912 at Jefferson Highland, New Hampshire, to obtain more records for comparison with those which had been procured there in former seasons and had served as the basis of my first paper.² The fifteen records which were then brought together had all been taken from one position, namely, the lawn with extended open space on either hand and the mountain side partially covered with mixed timber growth across the road. Here the awakening of the birds of the open country, the roadside, and the wood border had been recorded, but it remained to take position within the woods among the songsters resident there, and obtain records of their first songs. To effect this five records were taken in the midst of the fifty-acre piece of woodland lying between our buildings and the river and four others where in its lower extension it is bordered by a large field. In these locations I was brought near to some other species than those within range of hearing on the Highland. Nine other records were also procured in the former position on the lawn and at the gateway for the purpose of comparison with those previously obtained. On all occasions I was upon the chosen ground some time before the first song or call-note was given, so that I was assured that the earliest note had been heard; the time of waiting ranged from ten to thirty minutes; on many occasions it was fifteen minutes.

By these new records most of the statements of the first paper have been confirmed. Others require some modification. The flycatchers, the sparrows, and the thrushes still prove to be the earliest awakening birds, and the warblers as a family follow these. But the new positions taken, namely, in the heart of the woodland

¹ Read before the Nuttall Ornithological Club, March 17, 1913, and revised in accordance with additional records obtained in the season of 1913.

² Auk, XXIX, No. 3, July, 1912, pp. 307-327.

and also in its lower reaches near the river and its border by the open field, furnished much earlier awakenings of the warblers than had been my experience on the lawn and at the roadside, where the birds were heard at longer range. The new positions taken were also near the Olive-backed Thrush, the Veery, and the Indigo Bunting, and furnished records of Scarlet Tanager, Blue-headed Vireo, Winter Wren, Golden-crowned Kinglet, and Red-breasted Nuthatch at near range.

As something is gained by closely followed up experience in the way of overlooking no voices and in enabling the ear to reach out sensitively and hear every song uttered, it proves that in the case of some of the species recorded in the first paper, besides the warblers, an advance of some minutes in the time of first song has resulted. The loud singing of several near Robins introduces a difficulty in taking all records in the open near the house, as it tends to drown out the quiet earliest utterances of other songsters. For my experiences within the woodland and at its lower border, where the voice of Robin has scarcely been heard, show that nearly all the species resident there sing earlier than their songs have been heard on the Highland, where the voice of the Robin prevails so strongly. What was expressed in the first paper concerning the order of awakening of Song Sparrow, Chipping Sparrow and Robin is further substantiated by the records of 1912 and 1913, namely, that while the Robin is the earliest conspicuous singer by reason of its loud and continuous singing, yet the Song Sparrow and the Chipping Sparrow precede the Robin in several expressions of song, which must be regarded as morning awakening singing rather than as night utterances, the latter usually being only a single expression from a single bird, while the songs of awakening follow at intervals and come from several individuals.

The records within the woodland and at its lower border, where Wood Pewee and Alder Flycatcher are resident respectively, show that these flycatchers are the earliest of all the early songsters and give them first and second places in rank. Similar results were not obtained outside the woodland, so that these species were given a lower ranking in the first paper, based on records at longer range. The Oven-bird also is now ranked by its quite usual early flight song, which is so regularly given that it will not do to

overlook it as an expression of morning awakening, although it is often followed by only one or two repetitions, or by none at all, within the next forty or fifty minutes. Then the species begins to sing its usual song at the time of the other warblers. The Indigo Bunting also has been found to better the time previously named, when heard at close range. The Olive-backed Thrush, always recorded in former seasons at long range from my position in the open, is now ranked from the several hearings within the woodlands at closest range. And the warblers, now scheduled by their first songs heard at very close range, all prove to be earlier songsters than was indicated in the first paper, although they are still found to awake comparatively late, the earliest, Maryland Yellow-throat, being preceded by twenty-two species and not singing until eighteen minutes after the Robin, and the next earliest, Chestnut-sided Warbler, not singing until eight minutes later, or twenty-six minutes after the Robin. Many additional records of the Crow show that it retains about the same relative place, namely, as the thirtieth species in the order of awakening.

The records of 1912 which have been brought together were obtained between June 20 and July 15 inclusive. One in each of the several locations will be given as illustrative of the respective order of awakening therein. Three records were taken in the heart of the woodland. One of these is: July 6, sunrise at 4.09; out at 2.21; weather fair, wind northwest calm; temperature 70°; moon in last quarter shines out clear. Await on bench by stable some first note. Frogs croak in pond-hole some distance away. Enter wood with lantern at 2.39 and proceed down the footpath. There has been no note of any kind outside the wood. Reach bench where I seat myself at 2.44; no note yet of any kind within the wood. There is only the soft music of the streamlet near by, and occasionally the sounds of a mouse running over the leaves on the ground. At 2.47 Wood Pewee sings once; again, 2.51; Oven-bird gives flight song, 2.53, nearby, without leaving perch, I am quite sure; Wood Pewee, 2.56, sings four times, and at 2.58 sings and continues; 3.04, no thrush note yet; 3.05, second Pewee sings, and the two continue, singing constantly; Olive-backed Thrush gives whistle call, 3.12, then querulous call and sings at 3.13; second bird immediately gives "pep" call and sings; at 3.15 three Olive-

ocks are singing and continue their song; at 3.20 second Oven-bird gives a flight song; at 3.23 a Veery is heard calling in the distance; at 3.24 Black-throated Blue Warbler sings; at 3.25 Blue-headed Vireo; at 3.27 Red-eyed Vireo, very quietly, but is well heard; at 3.28 Wood Thrush sings, no previous calls having been heard; Blackburnian Warbler, 3.32; Parula Warbler, 3.34; Golden-crowned Kinglet, 3.36; at 3.38 the Wood Thrush has sung but little, but is singing freely now; Oven-bird's first usual song, 3.46, and it is continued; Wood Thrush still singing, 3.48; Crow's first call, 3.51; Redstart sings, 3.53; Black-throated Green Warbler also, 3.53; extinguish lantern, 3.58; emerge from the wood at 4.04 o'clock. Two other records obtained in the same location on July 9 and 15 are in their main features similar. The three records include sixteen species. Wood Pewee was first in each instance. The second place is taken by Oven-bird with a flight song, if the records be averaged. Veery ranks third. Olive-backed Thrush comes fourth, followed by Scarlet Tanager. The sixth and seventh places are taken by Blue-headed Vireo and Black-throated Blue Warbler respectively. Wood Thrush is eighth. The next four places are filled by Red-eyed Vireo, Blackburnian Warbler, Golden-crowned Kinglet, and Parula Warbler. The Crow with its call is thirteenth and Black-throated Green Warbler, fourteenth. Sapsucker and White-breasted Nuthatch, each on a single occasion, closed the record. The July 15 record, taken when the sun rose seven minutes later than on July 6, shows a somewhat later awakening into song than the difference in time of sunrise, indicating that as the season advances to the middle of July there is a disposition to delay awakening, as the spirit of song is already waning. The weather conditions were similar on the three mornings, and all the circumstances under which the records were obtained were alike.

On four other mornings I passed down through this same woodland a mile, more or less, to a position near its border, that I might be among another and different group of songsters. The woods terminate on this, the western, side in four or five acres of saplings and bushes with only occasional large trees, this section having been cut over within a few years. It is favorable, therefore, for wood-border and bush-dwelling species. A lantern was needed to show the trail and conduct safely as well as for making the rec-

ords, and a somewhat earlier start was necessary for covering the distance. One of these records taken within the wood near its border may serve for illustration of the awakening in that location. July 2, sunrise 4.06; out at 2.25; morning fair, wind south, light; temperature 53°. Woods were entered at 2.29. No note had been heard outside, and it is silent within. Reach position at 2.44, hang lantern on a tree, and wait. Not a note from anything on the way down, nor sound of any bird moving on its perch among the branches. Evidently neither the presence of the lantern in the wood nor my movement along the path tend in any way to disturb or arouse the bird occupants. And when a train has moved noisily through the valley, as has sometimes happened before awakening time, it plainly has no effect upon the still sleeping birds. They obviously bide their time with reference to the break of day and are not responsive to factitious lights or incidental sounds. At 2.45 a cock crows in the distance; at 2.54 an Alder Flycatcher sings once; at 3.01 a Song Sparrow gives a beautiful "flight" song without leaving its perch, I think; a second Song Sparrow sings immediately; a third one farther away sings at 3.04; an Oven-bird gives flight song at 3.05; immediately following the Oven-bird's outburst, a White-throated Sparrow close by in full, clear voice gives first three notes of its song; at 3.07 a Vesper Sparrow sings in the big field just beyond the wood border and continues its singing; Oven-bird sings a second time at 3.09; Indigo Bunting gives full song, 3.10, and continues; Olive-backed Thrush gives "pep" call, 3.10, and sings, 3.11; another immediately sings, and the two continue indefinitely; soon a third bird sings; Hermit Thrush is heard singing some distance away at 3.14, more clearly at 3.15; Wood Thrush's voice at 3.16; Junco's 3.18; White-throated Sparrow sings again, 3.19, and continues, three notes of the song only; Oven-bird sings again, 3.22; Veery calls, 3.24; Magnolia Warbler sings, 3.26; Red-eyed Vireo, 3.29; Canada Warbler, 3.30; Chestnut-sided Warbler, 3.30; second bird, 3.31; Redstart, 3.32; Parula Warbler, 3.34; Blackburnian Warbler, 3.37; Black and White Warbler, 3.41; Oven-birds begin to sing frequently in regular way, 3.45; Crow's first call, 3.52 o'clock. Start back up the path at 3.55; every bird is freely singing. The new voices are those of Black-throated Blue and Black-throated Green

Warblers, of Golden-crowned Kinglet, Blue-headed Vireo, and Wood Pewee. Purple Finch is not heard until 3.59, and Red-breasted Nuthatch until 4.15, although I had been within hearing earlier. Leave wood at 4.23 o'clock. On July 4 a second similar record was obtained in the same location.

Two other records were taken on July 8 and 12, when the position chosen was just outside the woodland and within the big field. One of these will serve for illustration. July 8, sunrise 4.11; out at 2.18; fair, wind south; temperature 70°; small waning moon bright. On the ground at 2.35. Not a sound of any kind along the way. At 2.38 a Song Sparrow sings once; up to 2.48 no other note; light of dawn is now quite apparent; at 2.49 Alder Flycatcher sings once, and again at 2.52 and 2.54; Song Sparrow gives second song at 2.55 and sings again at 2.59; Vesper Sparrow sings, 2.55, and again at 3.00, 3.01, and 3.03; at 3.04 the Vesper's is the only constant voice; Oven-bird gives flight song at 3.05; second bird is heard in flight song at 3.08 and 3.15; Indigo Bunting sings, 3.08; Wood Pewee, 3.09; the voices of Alder Flycatcher and Vesper Sparrow are constant now; Hermit Thrush's nasal call is heard, 3.10 (time of song inadvertently not recorded); Olive-backed Thrush's call, 3.11, and song, 3.12; Veery calls, 3.13; Scarlet Tanager sings, 3.16; Maryland Yellow-throat once at 3.17, again at 3.19 and continues; White-throated Sparrow, 3.19, full song, two birds singing; Savannah Sparrow, 3.20, and continues; Chipping Sparrow, 3.21; Junco, 3.25; Mourning Warbler, 3.28; Canada Warbler, 3.29; Chestnut-sided Warbler, 3.30; now there is a full chorus; Black and White Warbler, 3.36; Crow calls at 3.40; Red-eyed Vireo sings, 3.43; Winter Wren, 3.48, not earlier, as I had been listening with care for the song; is constant in song after first heard; Sapsucker calls at 3.58, as it clings to a hemlock; leave field at 3.59, closing the record.

The four records taken near the lower border of the wood and at the edge of the big field show that the Alder Flycatcher is often the first bird heard, as in the midst of the woodland the Wood Pewee was first on each occasion; that Song Sparrow is usually second, when not first, with a single song followed by repetitions rather infrequently, a second bird often singing immediately or very soon after the first and also giving repetitions of its song

rather infrequently; that Wood Pewee ranks third; that the Oven-bird is often fourth with a flight song which may be given a second time somewhat later, but that it is much later when the usual form of song is sung and repeated frequently; that Vesper Sparrow often ranks fifth, when not ahead of the Oven-bird's early flight-song; that Indigo Bunting is next in the order, but is sometimes preceded by Olive-backed Thrush or Hermit Thrush; that the latter is not lower than the eighth in rank and sometimes ranks higher, being accustomed to call for some time before singing, at least five minutes and sometimes ten, and, therefore, in respect to song taking a lower place; that the White-throated Sparrow often ranks next, although sometimes much higher, being less certain to take a definite position among the early songsters than they, having been on one occasion fourth and on some others below the ninth; that the Junco sometimes ranks closely with the White-throat; that Veery and Wood Thrush may follow next as eleventh and twelfth without being entirely reliable members of the chorus; that Scarlet Tanager sometimes occupied a place very close to the last-named thrushes; that Maryland Yellow-throat comes earliest of the warblers, if Oven-bird be excepted in its early flight song; that Chipping Sparrow and Savannah Sparrow in the open fields have filled the next places, not heard, however, in their first songs, as later experience has shown; that Red-eyed Vireo ranks seventeenth, but sometimes takes a lower place among the warblers, some of which are likely to be heard earlier than Red-eye; that then follow eight warblers in rather close ranking, but according to the local records in this order: Redstart, Chestnut-sided, Magnolia, Parula, Mourning, Canada, Blackburnian, and Black and White, the range of time being eight minutes; that the Crow takes the twenty-sixth place as heard from the wood border; that the Winter Wren does not sing until almost all the warblers have sung, four records varying but eight minutes; that the Sapsucker ranks last, taking the twenty-eighth place at ten minutes before sunrise.

Still other two records were procured in the same locality on July 18 and 27, but as these dates proved rather late in the singing season for obtaining satisfactory results, the records have not been used in drawing up the averages which are submitted in tabulated form.

Nine records were also obtained upon the lawn and at the gateway in similar manner to those which formed the basis of the first paper. One of these is presented in detail. June 20, sunrise at 4.02; out at 2.34; sky partially clouded, but some stars shining; wind south calm; temperature 52°. Glimmer of dawn is apparent. Complete silence reigns, excepting the distant sound of the flowing river in the valley. Up to 2.46 no note has been heard. At 2.47 Song Sparrow sings once; at 2.55 Chipping Sparrow gives a long trill; at 2.59 light has increased a little; at 3.00 Robin calls and a minute later sings, quietly at first; at 3.04 the same Song Sparrow sings once, and again at 3.05; at the same time a second Chippy trills once; at 3.06 a second Robin sings; at 3.08 Hermit Thrush sings; at 3.09 a third Robin, and the three continue singing; at 3.11 Song Sparrow repeats song again and again; Vesper Sparrow sings, 3.12; Tree Swallow at the same time begins its joyous flight which is continued for an hour or more; at 3.13 and 3.15 Chippy repeats trill; second Hermit is singing, 3.16; at 3.18 Indigo Bunting sings several times, and the first Chippy is singing constantly; Junco sings, 3.19; Savannah Sparrow, 3.20; Bluebird, 3.21; at 3.24 extinguish light of lantern; Olive-backed Thrush sings, 3.26; pair of Chipping Sparrows drop to the driveway at 3.30; four Chippies and three Robins are now singing; second Indigo Bunting sings, 3.30; second Junco, 3.31; Crow calls from the mountain side at 3.34, two or three times only; another Crow calls in the valley, 3.38; Red-eyed Vireo sings, 3.39; Wood Pewee is heard singing at 3.40, but must have sung much earlier; two Crows on the wing, 3.41; Oven-bird's first song, 3.42; Redstart in frequent song, 3.43; several Red-eyes are singing, 3.45; Robins have ceased to sing, 3.47; a bit of rosy light on clouds in the east, 3.49; Oven-bird is now heard again and again; Black and White Warbler sings, 3.55; Goldfinch calls passing in flight, 4.04; half a dozen species follow, but the songs are not regarded as their first; so the record is closed two minutes after sunrise. It has been found that first songs or calls which have not been heard until sometime after sunrise are seldom really first songs or calls, these having been lost through distance of range. So awakening records have been closed at sunrise or shortly thereafter.

A second record on June 23 under similar conditions of weather,

when Mr. Richard M. Marble recorded the awakening with me, shows that a Song Sparrow sang once at 2.45; that a Chipping Sparrow trilled once at 2.46, followed directly by a second bird; that Song Sparrow sang again at 2.52, and a second bird twice at 2.54; that the first Robin gave a few notes at 2.54 and began to sing freely at 3.04, a second Robin beginning to sing one minute later; that Veery first called at 3.05 and sang at 3.11; that Kingbirds gave a few calls at 3.07; that Alder Flycatcher sang at 3.09; that Tree Swallow was in song flight at 3.10; that Vesper Sparrow sang at 3.11, and Bluebird at 3.12 o'clock. The record then continues in quite the usual way. On June 26, 29, July 7, 10, 13, 17, and 28 similar records were taken. The last two have not been incorporated in the averages, because they were too late in the singing season for satisfactory results.

And an occasional individual record in the illustrative records which have just been presented has not been made use of, because not in harmony with the series of records of the species. Some censorship of this kind is quite necessary when a series of records is examined, as it sometimes happens that a late record can be accounted for by the fact that the bird was not near enough to be heard in its first songs. Experience must be availed of in deciding such questions.

The period within which all the records were obtained, which have been combined, extends from the time of earliest sunrise, which is 4.02 o'clock at Jefferson, to the time of sunrise at 4.16 o'clock; the variation in sunrise, therefore, is fourteen minutes. Had it been possible to procure the desired records between June 7 and 22, there would have been no variation in the time of sunrise to reckon with. As it is, an exact basis has been established by adopting the number of minutes before or after sunrise on each day of record for the time-record of each first song and by averaging the times on this basis. The clock-time when a species awakes to sing can thus be determined for any date. I have also averaged the clock-times, as taken by the watch, of first songs of each species throughout the series of records of each to obtain the average clock-time within the prescribed period. But this is not an unvarying basis, since it varies according to the dates of records; for it makes a difference whether the records of a species are ob-

tained wholly in June on days of earliest sunrise or wholly in July on days of later sunrise. For instance, seventy minutes before sunrise on June 20 is 2.52 o'clock, while on July 15 it is 3.06 o'clock. A series of records in June would, therefore, be at an earlier hour by the watch than a series of records in July. Many species included in the list have both June and July records, but two or three have only or mostly June records, as Phoebe, Kingbird, Tree Swallow, and Bluebird, while several residents of the woodland have only July records. The clock-time named for the former, therefore, is relatively earlier than the time named for the latter. Thus the clock-record assigned each species as to first song is not so exact as the number of minutes before or after sunrise, which is exact and definite for any date. So on the latter basis the species have been ranked in the table of awakening which follows. This was not done in the first paper, but the variation in time of sunrise was regarded as negligible. I find that it should not be so regarded, if one would attain accurate data.

The weather conditions were very uniform throughout the period in which the records of 1912, which have been combined, were taken. Every morning was fair and without wind. The June days were somewhat cooler than the July days. In the earlier part of June the weather had been continuously cold with frosts on the eighth and tenth days. There was much cloudiness with frequent rains, and winds were prevalent. A hot dry spell began on July 2 and continued to July 18, modified somewhat after the tenth day. Little rain fell. The conditions up to June 20, therefore, were unfavorable for obtaining satisfactory records, but on and after that date they were very favorable. In the season of 1913 propitious weather came earlier, and the records, sixteen in number, were obtained between June 8 and July 9 inclusive.

The view was expressed in the first paper that it seemed not unlikely that bright moonlight had no effect to awaken earlier the early-singing birds. Later experiences modify somewhat this view, as on June 19, 1913, the morning after the fulling of the moon, when it shone brightly at the time of morning awakening, some of the earliest-awakening birds made a demonstration unusually early. The Tree Swallow was in the air in song flight at 2.15, forty minutes or more before his customary time; a Kingbird passed

in flight singing at 2.58, winging his way some distance, twenty-four minutes earlier than he awoke on two other near occasions; a Robin began to sing at 2.41, sixteen minutes earlier than his next earliest awakening; and a Hermit Thrush broke into song at 2.59, six minutes earlier than on any other morning. The other earliest-singing birds, however, were scarcely influenced, for Song, Chipping, Savannah, and Vesper Sparrows, Alder Flycatcher and Phœbe sang no earlier than upon other occasions when the sky was only starlit. It was an early morning for the Crow, however, for its first calls were heard at 3.17; but among nineteen records there are five others also unusually early, one occurrence being on June 10, when calls were given at 3.10, on which date the moon was in the first quarter and had set at midnight. Therefore there appears to be no generally exerted influence of the moon to awaken the birds earlier than their wont, while it seems upon the morning named to have had an influence upon the few individuals specified. It could produce an effect only upon the earliest awakening birds, if upon any, for the light of the unrisen sun is always pervasive before the later birds awake to sing.

The view was also expressed in the first paper that cloudy conditions appear not to have had an influence to any extent in delaying the time of early song. Further experience mostly confirms this view. But occasionally there is a definite exception. On July 7, 1913, the awakening was late. The previous evening having been fine, I rose for an awakening record and proceeded half a mile into open country. The sky was clouded. A change to lower temperature had been inaugurated in the night. The morning was dull and cold, and such was the day throughout. Position was taken for the record at 2.42; it was 3.10 before the first Song Sparrow sang, eighteen minutes later than the average time. The song was repeated at 3.14, and a second bird sang then. It was 3.24 before a Vesper Sparrow was heard, nineteen minutes later than usual. Chipping Sparrow did not sing until 3.31 and Phœbe until 3.33 o'clock. No voice of Robin was heard before 3.43. This was the record just where the record of June 19 had been taken when the moon filled the sky with light and some of the birds awoke so early as to break all records. I think the delay was rather more due to a chilly morning introducing forbidding

weather for the day than to a cloud-spread sky. For when the air is soft and the day is to be comfortable and agreeable although clouded, the birds have often been as early to awake as on a starlit morning. Such a morning as has been described is usually avoided for obtaining a record, as it is sure to prove not representative. And even throughout the day song is much diminished. While upon warm, agreeably clouded days the birds are wont to sing especially freely.

The order of the tabulated list is the result of combining the records obtained in the four respective locations, as described, and in other near locations in the season of 1913. I should not expect another series of similar records to give entirely the same results, for local conditions and something of individuality in the near resident birds would be likely to modify the record season by season. But a series of records such as has been procured may fairly be regarded as representative and correctly indicating the general order of awakening. Without exact time-records throughout the prosecution of the work there would be no reliable data for general facts and deductions. These are manifestly the results which are of interest and value, since thereby we attain some definiteness to the whole order of the awakening, which is not invalidated by such variations as may occur once in a while and effect to change somewhat the relative position of a species. For notwithstanding some variance in relative position which a number of records may show, there is a general trend in the order of every awakening which is definite and fixed. The first nine species in the list are always the first nine with infrequent exceptions, and they awake to sing more than an hour before sunrise. The resident flycatchers are always very early; some of them are likely to be the earliest. Song Sparrow and Chipping Sparrow are with few exceptions the earliest sparrows. White-throated Sparrow is next earliest. Robin usually follows after these earliest flycatchers and sparrows. Oven-bird sometimes precedes them all with one or several flight songs. Barn Swallow and Tree Swallow also are very early. All other members of the flycatcher, sparrow, and thrush families which are present, twelve species in all, follow in the next fifteen minutes, or from an hour to three-quarters of an hour before sunrise, the Wood Thrush, however, proving by a single

season's records to be somewhat later, and Purple Finch and Goldfinch later still. Black-billed Cuckoo and Scarlet Tanager also rank among these. The two resident vireos with all the warblers voice themselves after the flycatchers, the sparrows, the swallows, and the thrushes, except Maryland Yellow-throat and the Oven-bird in its early flight songs. The warblers awake in quick succession when their time arrives, which is not until twenty-six and thirty-five minutes after the Robin and the Song Sparrow respectively; so thirteen species of warblers are found to awake and sing within seventeen minutes of one another,—eleven of the species within eleven minutes— or, from thirty-eight to twenty-one minutes before sunrise. The Crow's first call comes somewhat midway among the warblers' first songs at thirty-four minutes before sunrise. The Purple Finch's first song is at the same time. Golden-crowned Kinglet, Winter Wren, Chickadee, and Red-breasted Nuthatch are first heard among the latest warblers. Cliff Swallow is forty-four minutes later than the Barn and Tree Swallows; House Sparrow a few minutes earlier than the Cliff Swallow. Goldfinch follows at only a few minutes before sunrise. Bobolink usually waits for sunrising. Cedar Waxwing, Belted Kingfisher, and Chimney Swift commonly remain silent until the sun is risen. White-breasted Nuthatch and the woodpeckers also have not been heard until after sunrise, with the exception of the Sapsucker and sometimes the Pileated Woodpecker, nuthatches and woodpeckers usually taking place at or near the end of the awakening list. This general order one who has some familiarity with morning awakenings may confidently look for, as he moves forth at break of day, and he will not be likely to find many wide departures from it.

The occasional early songs of Song Sparrow and Chipping Sparrow, infrequently uttered, but quite regularly given, preceding the singing of the Robin, give these sparrows rank in advance of the latter. Mr. Francis H. Allen in his paper, entitled, "More Notes on the Morning Awakening" ('The Auk,' XXX, April, 1913, p. 229), takes a different view, regarding these early occasional songs as songs of the night and not of morning awakening. The record of June 23, 1912, may serve to illustrate the reason of my view: Song Sparrow sang at 2.45, 2.52, 2.54, 2.55, and 2.57;

two Chipping Sparrows sang at 2.46; a Robin gave a few notes at 2.54 and began to sing freely at 3.04 o'clock. The record of June 10, 1905, may further illustrate the position taken: Song Sparrow sang at 2.40, 2.48, 2.55, and a second bird at 2.57; Chipping Sparrow sang at 2.48; two Robins began to sing simultaneously at 3 o'clock. And the record of July 9, 1906, may be given as a third illustration: Song Sparrow, 2.54 and 3.05; Chipping Sparrow, 2.58 and 3.05; Robin, 3.08 o'clock. The records of 1913 furnish similar testimony. On June 8 a Song Sparrow sang at 2.58 and a second bird at 2.59; Chipping Sparrow sang at 2.59 and a second bird at 3.09; Robin sang at 3.02 and a second bird at 3.10 o'clock. On June 21 a Chipping Sparrow sang at 2.34, a second bird at 2.52, and the first bird again at 2.57; Song Sparrow sang at 2.54 and a second bird at 2.55; Robin sang at 3.01, a second bird at 3.08, and a third bird at 3.12 o'clock. On June 23, in a different location from June 21 and a half-mile distant, a Chipping Sparrow sang at 2.34, again at 2.53, and a second bird at 3.01; Song Sparrow sang twice at 2.43, a second bird at 2.47, the first bird again at 2.54, and a third and a fourth bird at 2.56; Robin began to sing at 2.58 o'clock. One other supporting reason for the view that the very early songs of Song Sparrow and Chipping Sparrow are true songs of awakening may be named. The infrequent repetition of earliest song in the awakening is characteristic also of even-song, for the records show that the last songs are often given at long intervals and the final one or two renderings may be many minutes after the next preceding. This is characteristic also of the Savannah and White-throated Sparrows only to a less degree, for these also commonly give a song or two in awakening some minutes earlier than they come into constant song. The Vesper Sparrow on the contrary usually takes up free singing promptly after its first song.

A marked exception on one occasion, July 1, 1912, was a Robin beginning to sing at 2.38, or 88 minutes before sunrise. This bird continued its song for 66 minutes, or about 20 minutes longer than is the usual period of first song. A second bird, beginning to sing at 3.07, paused at 3.53, or after 46 minutes of song, that is, within the usual time limits. I have regarded this instance as an exception and not included the record in drawing up the average time of first song of the Robin, since among many records in the

season of 1912 and in former seasons there has been no similar instance. Usually a second and a third Robin sing from one to seven or eight minutes after the first bird. The full records of 1913 further confirm the priority of Chipping Sparrow as well as Song Sparrow. Eleven records of Song Sparrow average 77 minutes; ten records of Chipping Sparrow, 67 minutes; and nine records of Robin, 63 minutes. Complete records of the three species, twenty-eight in number, average for Song Sparrow 73 minutes, for Chipping Sparrow, 66 minutes, for Robin 64 minutes. These times are identical with those given in the table, which covers the seasons of 1912 and 1913 only.

The Oven-bird's very early flight song, often followed by a second rendering somewhat later or sung by a second bird, or both, precedes by forty to fifty minutes, and sometimes even more, the regular song of the species, which averages to be given at 3.34, as many records show. Thus the Oven-bird in the time of its usual song ranks with the other warblers. But it so often sings its flight song once or twice at the much earlier hour that this song is now adopted to give the species its ranking.

As to the Barn Swallow, the farm barn having been removed, which had stood in the near neighborhood and was always occupied by a colony, no satisfactory records were obtained in the season of 1912. So the eleven records of this colony in previous seasons which were combined in the first paper are retained, supplemented by three records of 1913.

A pair of Tree Swallows nested in 1912 and again in 1913 in a box fastened to the front of the stable. The records are of the male bird in song flight between May 31 and June 17, 1913, inclusive. The records of 1912 obtained later in June and in early July on account of previous unfavorable weather, because less representative, have not been retained. There are three records of 2.56, 2.57, and 2.58, or 68, 66, and 64 minutes before sunrise; and one record is extraordinarily early, namely, 2.15 on June 19, a morning of remarkable clearness with full moon and the stars shining brilliantly. I was out at 2.15 and instantly heard the swallow in its song flight. I think it had just mounted into the sky and begun its song at 107 minutes before sunrise. As I have no other record within 42 minutes as early, I am inclined to regard this extremely

early awakening as due to the brilliancy of the sky and the amount of light present, suggesting to the bird that the "time to be up" had come. I have not combined this record with the others to form the average, regarding it as exceptional.

Mr. Allen gives an early record of 2.53; his next earliest is 3.07; Dr. C. W. Townsend is quoted with a 2.58 record. These records are in agreement with my series of six, which range from 2.56 to 3.07, or from 55 to 68 minutes before sunrise. The endurance of the bird in song flight is indeed remarkable, as Mr. Allen so well states. I have not timed its length, but my impression is that it continues unabated in vigor and ebullition of joy often more than an hour.

An Olive-sided Flycatcher located for a time at the border of the lower extent of woodland in the season of 1913 and furnished two records on June 11 and 13, which average 57 minutes before sunrise and 3.04, the earlier being at 2.51, when the bird sang once and in a half-minute again, coming into frequent repetitions of his song at 3.15 o'clock. Later in the month he was not heard and must have moved on to other ground for mating.

The Olive-backed Thrush's ranking has been advanced many minutes by records of 1912, within the woodland taken near to the songsters; four in the lower woodland average 56 minutes before sunrise; three in the upper woodland, 53 minutes. The slightly earlier singing in the lower woodland near the border of the big field among sparse growth of timber may be due to the light of dawn breaking through there a few minutes earlier than it does into the heart of the woods, where the shade is dense. The earliest record in the lower section of the wood is 63 minutes, while the earliest in the upper section is 57 minutes. In each location three and sometimes four birds awoke to sing in quick succession. Either one of the call-notes, or, it may be, all three of the calls are repeated only for a minute or two preliminary to the song. On the other hand the Hermit Thrush usually calls for five minutes and sometimes for ten minutes before singing. The records of both species are based on song. Those of 1913 are in close agreement with the previous season's.

The Kingbird has not furnished entirely satisfactory records as yet. With the exception of one, which is unusually early, when

the bird passed in song flight at 2.58 on a moonlit morning, six records of close similarity average 3.16 o'clock. The very early record has been included in drawing the average, and the result of the seven records is 3.13 o'clock. Mr. Allen's average for ten records is 3.10, and Dr. Townsend is quoted with a 3.08 record. My records, therefore, with the single exception named, are uniformly later, since five minutes require to be added to them in comparing them with Boston records. And in even-song the Kingbird has not been heard as late as the other flycatchers by many minutes.

In early July, 1912, the song of a Wood Thrush was heard daily in the woodland. At first the bird was located in the lower reaches of the wood and on July 2 and 4 averaged to sing 43 minutes before sunrise. Later it frequented the upper section of the wood and on July 6 and 9 the average time of first song was 34 minutes. Twice also the song entered the record taken on the lawn, namely, on July 7 and 10, when the average time was 34 minutes. The average time of the six records is 37 minutes and 3.32 o'clock. On one occasion the bird repeated its song a few times only during the first ten minutes and then sang freely for fifteen minutes. On another occasion two minutes after its first song it began to sing freely and continued singing for twenty minutes. The time given in the first paper for three June records is 36 minutes and 3.26 o'clock.

Of the ten records in 1912 of the Crow's first call, averaging 35 minutes before sunrise and 3.35 o'clock, three are very exceptional, since a call or two were heard much earlier than on the other seven occasions, namely, 69, 49, and 41 minutes before sunrise respectively. These few very early calls were not followed by others until the usual time for the Crow to be heard. Were these few exceptionally early calls disregarded, the average time of the ten records would be 28 minutes and 3.41 o'clock, and the variation in time would be but nine minutes for the ten occasions. The three exceptional records advance the average time of the Crow seven minutes. The time given in the first paper was 21 minutes and 3.44 o'clock, due to the inclusion of four unusually late records. Had these been eliminated, the remaining ten records would have averaged 24 minutes and 3.42 o'clock, the variation in time being

twelve minutes. Twenty records would then give the average time of the Crow's first call as 26 minutes and 3.42 o'clock and would place the species seven lower in the list. We, however, have given it the benefit of the three exceptionally early records of 1912, which advance the time seven minutes. The records of 1913, nine in number, average 32 minutes and 3.31, there being again in this season three records very much earlier than the other six, namely, at 52, 45, and 39 minutes. These nine records combined with the ten of 1912 give an average time of 34 minutes and 3.33 o'clock. Mr. Allen's average of thirteen records is 3.33 o'clock. There is entire agreement, therefore, in the time of the Crow's first calls, barring the difference in time between Boston and Jefferson, but as twenty-nine species in this mountain hamlet precede it in awakening song, ranging from 48 to 3 minutes earlier, I venture still to call the Crow "a comparatively late riser."

The House Sparrow's record was obtained on the four occasions in the season of 1913 on which I procured the records of the Cliff Swallow, a half mile distant. Happily the species is no nearer our home than this! Four records of awakening with first calls were 3.38, 3.40, 3.43, and 3.45, differing but three minutes in respect to sunrise.

Cliff Swallows in a large colony of seventy-five to a hundred pairs occupy the eaves of a large farm barn half a mile away. On four mornings of 1913, June 19, 23, 30, and July 7, position was taken in front of this barn at 2.33, 2.24, 2.23, and 2.42 respectively. The first three mornings the sky was clear. The fourth morning was cloudy, and a change to low temperature had occurred during the night. The eaves were carefully watched on these occasions and no swallow came from them or voice of swallow was heard until 3.41, 3.47, 3.45, and 3.57 respectively, the delay upon the clouded morning being seven minutes later than the average time of the other three in respect to sunrise. The Cliff Swallow, therefore, differs widely from the Tree Swallow and the Barn Swallow in its time of awakening, being forty-four minutes later than they, and waiting until it is fully light or within seventeen minutes of sunrise. May this trait not be a relic of its earlier habit of nesting in holes in cliffs? Even now the retort-like entrances to their nests seclude the birds as it were within a hole. And all the hole-nesting birds,

as far as my observations have gone, are late risers, namely, the kingfisher, the swift, the woodpeckers, and the nuthatches. Perhaps the Bluebird also is later than the other thrushes because of its hole-nesting habit. My few records show it to awake 18 minutes later than the Robin and from 6 to 8 minutes later than Veery, Hermit and Olive-backed Thrushes.

There are eight records of the Goldfinch in 1912 obtained in July, averaging 4 minutes before sunrise and 4.11 o'clock, the variation in time of which, excepting one record, is but three minutes. The average of the seven records is three minutes before sunrise. On July 7 a bird began to call in a near tree by the roadside at four minutes before sunrise. I had not perceived it come on the wing, and the inference was that it had spent the night in this tree. There was a nesting in the middle of July in the orchard. On July 10, 13, and 17 the male bird's song in the air was recorded at one, one, and two minutes before sunrise respectively. On July 28, the date of earliest awakening, the call was first given thirteen minutes before sunrise, and one minute later the male bird was on the wing in jubilant song, while the female bird continued her calls in the orchard. This earliest of song records has been included notwithstanding the lateness of the date, because the song season of the Goldfinch was still at its height. It also indicates that the birds, contrary to the usual course, awoke on this date as early as they had done ten days earlier, although sunrising was ten minutes later, which accounts for the record being as early as thirteen minutes before sunrise. So the Goldfinch quietly awaits the full light of day before becoming responsive in movement and song. Six records of 1913 average seven minutes before sunrise, and the entire fourteen records, five minutes.

Belted Kingfisher nested in a gravelly bank at the roadside a quarter of a mile away in 1913. Three records were obtained on June 15, 21, and 25. On the earliest date position was taken at 2.28. The male bird came to the bank with rattle call at 3.53; but flew away without perching; at 4.02 he came again and perched on a fence post just above the nest; at 4.05 he left again. On the second occasion at 4.04 one of the pair flew from the bank calling in flight, presumably the female. At 4.10, 4.14, 4.18 and 4.21 one of the birds successively approached without coming to the bank,

being suspicious evidently on account of my presence near the nest. At 4.24 the female, presumably, returned into the hole. On the third occasion I was in position at 2.30. At 4.16 the first rattle was heard of one of the birds approaching, and a minute later perch was taken on the fence post above the nest. These records, while not wholly conclusive, indicate that the Kingfisher is a late riser like other hole-nesting birds.

The record of Chimney Swift has been transferred from the first paper, no birds having occupied near chimneys in the season of 1912. And in this season so few records of Chickadee and Bobolink were obtained, I have combined with these, supplemented by records of 1913, the records of the several previous seasons in drawing the averages of these species.

Voicings of the nuthatches have not been heard on any occasion until well toward the close of the record or until after the songs of the flycatchers, the warblers, and the thrushes had all been heard, although I have often been within range of their voices. A pair of White-breasted and two pairs of Red-breasted have been resident within the wood. The voices of the latter have followed closely after the song of the latest awakening warbler, the Bay-breast. The voice of the former has been many times heard when later rambles through the woodland have been taken, but has been recorded but once during morning awakening. The nuthatches, therefore, like the woodpeckers, appear to first voice themselves among the latest awakening species, when they are not the last of all.

The voice of the Pileated Woodpecker has been frequently heard when I have taken my customary walks in the wood in the early morning. That it has reached me but once while recording morning awakening is accepted as evidence that the species seldom voices itself until after sunrise. The time given in the first paper based on eight records, mostly obtained in June, was 11 minutes after sunrise. There are two before sunrise records of 16 and 9 minutes in 1905 and 1902. I cannot say that the Downy Woodpecker does not sometimes voice itself before sunrise in call, or song, or rappings, but the experience of many morning awakenings is that it does not.

Other species which entered into the records of 1912 and 1913,

but came within hearing in a casual way only, were: Broad-winged Hawk (*Buteo platypterus*), 4.05; Barred Owl (*Strix varia varia*) hooting at 2.18, 2.38, 2.39 and 3.01 on four several occasions; Great Horned Owl (*Bubo virginianus virginianus*) calling at 2.27 and 2.37 on two occasions; Nighthawk (*Chordeiles virginianus virginianus*) at 2.24, 2.57 and 2.58 on three occasions; Ruby-throated Hummingbird (*Archilochus colubris*), 3.55 and 4.33; Crested Flycatcher (*Myiarchus crinitus*), 5.30; Pine Siskin (*Spinus pinus*, 5.04; Rose-breasted Grosbeak (*Zamelodia ludoviciana*), 3.56; Water-thrush (*Seiurus noveboracensis noveboracensis*), 5.02; Brown Creeper (*Certhia familiaris americana*), 4.13 o'clock.

Were the species ranked in accordance with the single earliest song of each, the order would be somewhat changed but in no very essential particular, as may be seen by the table which follows. Occasionally a species would rank several higher or several lower, but these variations would not destroy the general trend as to families and their relative places in the awakening.

In drawing up the averages presented in this paper the records of seasons previous to 1912 and 1913 have not been retained, except where their use has been already mentioned. The desire was to start anew with the experience previously gained and outline as true an order as circumstances would allow. That it is not perfect and may be amended by future experience of himself and others the author is well aware and is content in the thought.

It should be borne in mind that five minutes should be added to the clock time records to obtain the corresponding time at Boston, as sunrise is five minutes earlier in Jefferson.

Attention was also given to even-song in the season of 1912. Ten records were obtained on the lawn, three in the heart of the woodland, and one at the lower border of the woods. They were taken between June 23 and July 24 inclusive, a period during which the variation in time of sunset is thirteen minutes, namely, from the time of latest sunset, which is 7.30 at Jefferson, to its setting at 7.17 o'clock. The method pursued is opposite to that followed in morning awakening, when each species is enrolled by its first song or call. In even-song each is enrolled by the time it ceased to sing or give a call-note. So it is necessary from the beginning to record each minute the birds which are singing. When one ceases,

ORDER OF AWAKENING.

Relative order of awakening	Names of Species.	Number of records	Average number of minutes before sunrise of first song	Earliest initial song (minutes before sunrise)	Latest initial song (minutes before sunrise)	Average clock-time, A. M., of the records	Clock-time corresponding to earliest sunrise at 4.02
1	Wood Pewee (<i>Myiochanes virens</i>)	6	82	93	75	2.46	2.40
2	Alder Flycatcher (<i>Empidonax traillii alnorum</i>)	10	77	80	53	3.40	3.35
45	Chickadee (<i>Parus atricapillus</i>)	12	22	33	13	3.43	3.40
46	Bay-breasted Warbler (<i>Dendroica castanea</i>)	6	21	32	16	3.43	3.41
47	Red-breasted Nuthatch (<i>Sitta canadensis</i>)	*4	17	27	8	3.49	3.45
48	Cliff Swallow (<i>Petrochelidon lunifrons</i>)	*4	17	21	12	3.47	3.45
49	Yellow-bellied Sapsucker (<i>Sphyrapicus varius varius</i>)	*9	7	15	1†	3.59	3.55
50	Goldfinch (<i>Astragalinus tristis tristis</i>)	14	5	14	0	4.05	3.57
51	Cedar Waxwing (<i>Bombicilla cedrorum</i>)	*4	1†	6	3†	4.03	4.03
52	Belted Kingfisher (<i>Ceryle alcyon alcyon</i>)	*3	2†	9	12†	4.04	4.04
53	Bobolink (<i>Dolichonyx oryzinorus</i>)	14	3†	28	19†	4.07	4.05
54	Chimney Swift (<i>Chaturax pelagica</i>)	10	5†	6	19†	4.10	4.07
55	White-breasted Nuthatch (<i>Sitta carolinensis carolinensis</i>)	*1	10†	10†	10†	4.21	4.12
56	Northern Pileated Woodpecker (<i>Pileatus pileatus abieticola</i>)	9	11†	16	13†	4.17	4.13
57	Downy Woodpecker (<i>Dryobates pubescens medianus</i>)	4	19†	3†	27†	4.22	4.21

* Call-note. † After sunrise.

ORDER OF AWAKENING.

Native order of awakening	Names of Species.	Number of records	Average number of minutes before sunrise of first song	Earliest before sunrise (minutes before sunrise)	Latest initial song (minutes before sunrise)	Average clocktime, A. M., of the records	Clock-time corresponding to earliest sunrise at 4 02
1	Wood Pewee (<i>Mijolichanes vires</i>)	6	82	93	75	2.46	2.40
2	Alder Flycatcher (<i>Empidonax traillii albarum</i>)	10	77	89	63	2.49	2.45
3	Song Sparrow (<i>Melospiza melanota melodia</i>)	22	73	90	55	2.52	2.49
4	Oven-bird (<i>Seiurus aurocapillus</i>)	16	70	91	54	2.55	2.52
5	Chipping Sparrow (<i>Spizella passerina passerina</i>)	6	66	87	48	2.58	2.56
6	White-throated Sparrow (<i>Zonotrichia albicollis</i>)	6	65	87	50	2.59	2.57
7	Robin (<i>Planesacus migratorius migratorius</i>)	16	64	81	56	3.00	2.58
8	Barn Swallow (<i>Hirundo erythrogastra</i>)	14	61	82	45	3.02	3.01
9	Tree Swallow (<i>Iridoprocne bicolor</i>)	6	61	68	55	3.01	3.01
10	Vesper Sparrow (<i>Pooecetes gramineus gramineus</i>)	16	60	76	48	3.05	3.02
11	Savannah Sparrow (<i>Passerculus sandwichensis sananna</i>)	16	59	75	46	3.06	3.03
12	Black-billed Cuckoo (<i>Coccyzus erythrophthalmus</i>)	3	57	72	30	3.07	3.05
13	Olive-sided Flycatcher (<i>Nuttallornis borealis</i>)	2	57	71	44	3.04	3.05
14	Olive-backed Thrush (<i>Hylocichla ustulata swainsoni</i>)	13	54	63	47	3.13	3.08
15	Phoebe (<i>Sayornis phoebe</i>)	16	53	68	45	3.10	3.09
16	Hearnit Thrush (<i>Hylocichla guttata pallasi</i>)	18	53	63	45	3.13	3.09
17	Indigo Bunting (<i>Passerina cyanea</i>)	14	52	63	42	3.14	3.10
18	Veery (<i>Hylocichla fuscescens fuscescens</i>)	16	52	59	42	3.15	3.10
19	Kingbird (<i>Tyrannus tyrannus</i>)	7	51	61	40	3.13	3.11
20	Scarlet Tanager (<i>Piranga erythronotus</i>)	4	51	57	42	3.21	3.11
21	Least Flycatcher (<i>Empidonax minimus</i>)	2	51	54	47	3.13	3.11
22	Slate-colored Junco (<i>Junco hyemalis hyemalis</i>)	15	46	60	40	3.20	3.16
23	Maryland Yellow-throat (<i>Geothlypis trichas trichas</i>)	6	46	54	43	3.20	3.16*
24	Bluebird (<i>Sialia sialis sialis</i>)	6	46	51	36	3.19	3.16
25	Chestnut-sided Warbler (<i>Dendroica pensilvanica</i>)	7	38	41	36	3.27	3.24
26	Wood Thrush (<i>Hylocichla ustulata</i>)	6	37	50	26	3.32	3.25
27	Magnolia Warbler (<i>Dendroica magna</i>)	9	37	43	32	3.28	3.25
28	Mourning Warbler (<i>Opaporhynchus phalaenoptera</i>)	5	37	42	22	3.32	3.25
29	Black-throated Blue Warbler (<i>Dendroica caerulescens caerulescens</i>)	9	37	41	28	3.32	3.25
30	Crow (<i>Corvus brachyrhynchos brachyrhynchos</i>)	*19	34	64	17	3.33	3.28
31	Purple Finch (<i>Carduelis purpureus purpureus</i>)	6	33	45	21	3.29	3.29
32	Blackburnian Warbler (<i>Dendroica fusca</i>)	14	33	41	27	3.33	3.29
33	Canada Warbler (<i>Wilsonia canadensis</i>)	7	32	42	27	3.34	3.30
34	Red-eyed Vireo (<i>Vireosylva olivacea</i>)	22	31	42	23	3.34	3.31
35	Redstart (<i>Setophaga ruticilla</i>)	9	30	40	24	3.37	3.32
36	Northern Parula Warbler (<i>Compsophyalis americana usnea</i>)	11	29	35	23	3.38	3.32
37	Blue-headed Vireo (<i>Laniroo solitarius solitarius</i>)	8	28	48	13	3.39	3.34
38	Black-throated Green Warbler (<i>Dendroica virens</i>)	7	28	33	25	3.38	3.34
39	Black and White Warbler (<i>Mniotilta varia</i>)	4	27	35	22	3.41	3.35
40	Golden-crowned Kinglet (<i>Regulus satrapa satrapa</i>)	9	27	33	22	3.40	3.35
41	Nashville Warbler (<i>Vermivora rubricapilla rubricapilla</i>)	3	27	33	22	3.38	3.35
42	Winter Wren (<i>Taeniopygia bairdii bairdii</i>)	3	25	31	21	3.49	3.37
43	Myrtle Warbler (<i>Dendroica coronata</i>)	2	24	49	21	3.40	3.38
44	House Sparrow (<i>Passer domesticus domesticus</i>)	*4	23	25	22	3.41	3.39
45	Chickadee (<i>Parus atricapillus atricapillus</i>)	12	22	33	13	3.43	3.40
46	Bay-breasted Warbler (<i>Dendroica castanea</i>)	6	21	32	16	3.43	3.41
47	Red-breasted Nuthatch (<i>Sitta carolinensis</i>)	*4	17	27	8	3.49	3.45
48	Cliff Swallow (<i>Petrochelidon lunifrons lunifrons</i>)	*4	17	21	12	3.47	3.45
49	Yellow-bellied Sapsucker (<i>Sphyrapicus varius varius</i>)	*9	7	15	11	3.59	3.55
50	Goldfinch (<i>Astragalinus tristis tristis</i>)	4	5	14	0	4.05	3.57
51	Cedar Waxwing (<i>Bombusilla cedrorum</i>)	*4	11	6	31	4.03	4.03
52	Belted Kingfisher (<i>Ceryle alcyon alcyon</i>)	*3	21	9	121	4.01	4.01
53	Bobolink (<i>Dolichonyx oryzivorus</i>)	14	31	28	191	4.07	4.05
54	Chimney Swift (<i>Nyctalus lateralis</i>)	*1	101	51	6	191	4.10
55	White-breasted Nuthatch (<i>Sitta carolinensis carolinensis</i>)	*1	101	101	4	4.21	4.12
56	Northern Pileated Woodpecker (<i>Ptileolus pileatus abieticola</i>)	9	111	16	131	4.17	4.13
57	Downy Woodpecker (<i>Dryobates pubescens medianus</i>)	4	191	31	271	4.22	4.21

* Call-note.

† After sunrise.

the time of its last song is thus known. And when the record of the evening has been completed, the species are ranked in their true order. The earlier records of the season were begun about 6.30, or an hour before sunset; the later about 6.45, or from thirty to forty minutes before sunset. A few species always dropped out almost at once. Other species continued their songs for some time, either singing constantly or after intervals of rest resuming their songs. Still others sang from the beginning to the close. All the species which entered into the morning awakening records are included in even-song, except House Sparrow and White-breasted Nuthatch, a full quota of voices having been heard by visiting the several locations. In the season of 1913 thirty evening records were taken, covering a wider range of location, between June 2 and July 8 inclusive. These have been combined with the records of 1912 in drawing up the averages presented in the table of even song. Records previous to these two seasons have been only exceptionally retained.

As stated in the first paper, all these records show that even-song does not extend as long after sunset as matins precede sunrise. For while the earliest nine singers in morning awakening precede sunrise by an hour to an hour and twenty minutes, the latest nine singers in even song cease singing from twenty-seven to thirty-seven minutes after sunset, a shortening of thirty-five to forty minutes. And it also continues to hold true by the records of 1912 and 1913 that the order of the awakening, generally speaking, is reversed in the evening. So the flycatchers, the sparrows, and the thrushes are the latest singers, just as they are the earliest in the morning. The thrushes, however, are invariably the last of all, Wood Pewee, Alder Flycatcher, and Scarlet Tanager only ranking with them. Five of the thrushes, Wood, Hermit, Robin, Veery, and Olive-backed, continue to sing from twenty-seven to thirty-seven minutes after sunset. The Bluebird's record does not extend as late by ten minutes. Black-billed Cuckoo's, Belted Kingfisher's, and Olive-sided Flycatcher's calls cease about the time of the Bluebird's song. The Barn Swallow's record is twenty-seven minutes after sunset. Five common sparrows, Savannah, White-throated, Vesper, Chipping, and Song, and the two flycatchers, the Least and Phœbe, cease singing just earlier, or from twenty-

seven to twenty-two minutes after sunset. Indigo Bunting and Junco records and those of the Kingbird do not extend as late. All the warblers end their songs before the sparrows and these flycatchers during the preceding twenty-seven minutes or from twenty-two minutes after sunset to five minutes before, Myrtle Warbler, however, ceasing earlier. Blue-headed Vireo ranks among the later singing warblers, while Golden-crowned Kinglet and Red-breasted Nuthatch rank with the earlier-ceasing warblers. Chimney Swift, Tree Swallow, and Bobolink become silent immediately after the going down, of the sun. Cliff Swallows keep in the air some minutes later. The Crow gives its last calls a few minutes before and seldom are any heard after sunset. At the same time, just before sunset, Purple Finch and Goldfinch end their songs, and Cedar Waxwings cease to call. Red-eyed Vireo ceases to sing fourteen minutes before sunset; Winter Wren and Chickadee still earlier. The voices of the woodpeckers are lost first of all soon after the recording has begun, or from half an hour to an hour before sunsetting, as in the morning their first calls are seldom heard until after sunrise; the Sapsucker, however, detaches itself somewhat from the group by being less late in the morning and later in the evening than the others.

Averages have been drawn in the same manner as for morning awakening, and the number of minutes before or after sunset of the last song of each has been adopted as the basis of ranking the species, as was done in matins. The average clock-time of the records, as appealing more naturally to the mind, is also named. But this is not exact, if it be unrelated to the time of sunsetting. The probable time of last song of any species for any date, however, may be easily reckoned, when the time of sunset on that day is known. For while there is not an exact gradation in a series of records of any species following the gradation of earlier sunsetting, there is a close approximation to this. So, as the sun comes to set earlier evening by evening, the record closes proportionately earlier. But, as has been already stated, it has been found when a species is nearing the end of the season of its singing that the weakening spirit of song tends to bring the birds less promptly into song in the morning and to lead them to cease singing somewhat earlier in the evening. Thus late July records usually indicate this waning

spirit and a still earlier close of even-song, except, it may be, in the case of a few species like Wood Pewee, Red-eyed Vireo, Indigo, Bunting, and Hermit Thrush, which continuing their singing well into August are vigorous singers throughout July.

The Oven-bird in even-song not infrequently makes the flight song its last utterance. When this is not its last song, it often has been given several times during the final hour of singing. On July 7, 1912, three flight songs were given at about ten minute intervals, 7.18, 7.27, and 7.37 o'clock. In 1913 on nine evenings out of seventeen a flight song was the final song and was given at 7.32, 7.35, 7.35, 7.38, 7.43, 7.44, 7.44, 7.56, and 8.01, the variation in minutes after sunset being from 9 to 16, except on the two occasions of latest song, when the rendering of the flight song was 31 and 35 minutes after sunset, corresponding in some degree to the quite usual very early song in morning awakening.

Song Sparrow and Chipping Sparrow at the close of the day also give infrequent repetitions of their songs as their earliest songs in morning awakening are infrequently given. In the case of Song Sparrow in the evening of July 24, 1912, there were but eight repetitions of the song in the last twenty-five minutes of the bird's singing. Chippies sing no hurried trills in the evening as they regularly do in the morning awakening.

Three records of the Wood Thrush in 1912 average 27 minutes after sunset and 7.55 o'clock; the latest is 34 minutes on July 5. On this occasion, as I entered the woods at 6.43, the thrush was singing, and he sang much of the time up to his last song a half-minute after 8.02, then gave a few calls which ceased at 8.03 o'clock.

Twenty records of Hermit Thrush average 33 minutes after sunset and 8.02 for calls as well as the song; the latest are 40 minutes on two occasions when the calls extended to 8.09 and 8.10, the song having ceased at 8.07 and 8.05, respectively. On one other evening the song also extended to 8.05 o'clock.

Twenty-five records of the Robin average 33 minutes after sunset and 8.01 for calls as well as song. Calls are usually given for several minutes after the birds have ceased to sing. Sometimes the song ends much earlier. The latest record is 45 minutes and 8.15 for last calls, when the song ceased but one minute earlier. The variation in time of last note is fifteen minutes, but if the latest

record of 1913 be excepted, it is but eleven minutes in the sixteen evenings. The difference in the amount of the Robin's even-song is very wide. On one occasion there was no song the entire time of the record which began at 6.30, and only infrequently was a call heard. During the time of even song on several occasions Robins have sung but little, voicing themselves intermittently only, which is very unlike their jubilant and continuous singing for forty or forty-five minutes in the morning awakening. On the other hand occasionally one of the Robins of the neighborhood becomes a very free singer in the evening.

Nineteen records of Veery average 35 minutes after sunset and 8.03 for calls as well as song. The latest record for the song is 40 minutes at 8.08 on July 8, 1913; there is a similar record for the call on June 10 at 8.05, 40 minutes. The variation in time of last song is fifteen minutes, but on fourteen of the evenings is but three minutes, constituting the Veery one of the most regular of all the species in retiring to rest.

Thirty-two records of Olive-backed Thrush average 37 minutes after sunset and 8.05 for the song; for calls one minute later. The latest is 49 minutes at 8.10 on June 4, 1913, for the song. Four other records for the song are just earlier, at 41 and 42 minutes. The variation in time of last song on twenty-seven occasions is but seven minutes, constituting the Olive-backed Thrush as well as the Veery one of the most regular of all the species in its final song before rest.

These species were only casually recorded: Sharp-shinned Hawk (*Accipiter velox*) pursued by a pair of Tree Swallows, 7.21; Barred Owl (*Strix varia varia*), 7.40; Northern Flicker (*Colaptes auratus luteus*), 7.18; Whip-poor-will (*Antrostomus vociferus vociferus*) singing from 7.28 to 7.43; Nighthawk (*Chordeiles virginianus virginianus*), 7.32 to 7.34; Ruby-throated Hummingbird (*Archilochus colubris*), 7.20 to 7.42 o'clock. The Hummingbirds visited an apple-tree in blossom in the evening of May 31, 1913. One of the pair was seen hovering over the flowers at 7.20; the second appeared five minutes later, and the two together were busily engaged sipping and humming for four or five minutes, when one flew away and the other remained until 7.42, or 24 minutes after sunset, at which time the light had become rather dim.

1914

1915

1916

1917

1918

1919

1920

1921

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1923

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1925

1926

1927

1914

1915

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1917

1918

1919

1920

1921

1922

1923

1924

1925

1926

1927

ORDER OF EVEN-SONG.

Relative order of latest song

Relative order of latest song	Names of Species.	Number of records	Average number of minutes before or after number of latest song	Latest final song (minutes before or after sunset)	Earliest final song (minutes before or after sunset)	Average clock-time, P. M., of the records	Clock-time corresponding to latest sunset at 7,300
	<i>Before sunset</i>						
1	Northern Pileated Woodpecker (<i>Ptilotomus pileatus abieticola</i>)	1	59	59	59	6:31	6:31
2	Downy Woodpecker (<i>Dryobates pubescens medianus</i>)	2	31	23	39	6:54	6:59
3	Chickadee (<i>Parus atricapillus atricapillus</i>)	2	23	19	28	7:04	7:07
4	Myrtle Warbler (<i>Dendroica coronata</i>)	6	19	31	33	7:06	7:11
5	Winter Wren (<i>Tannus hiemalis hiemalis</i>)	1	17	17	17	7:12	7:13
6	Red-eyed Vireo (<i>Vireosylva olivacea</i>)	10	14	41	25	7:19	7:16
7	Cedar Waxwing (<i>Bombusilla cedrorum</i>)	*4	7	3	9	7:19	7:23
8	Red-breasted Nuthatch (<i>Sitta canadensis</i>)	*4	6	71	13	7:22	7:24
9	Chestnut-sided Warbler (<i>Dendroica pensilvanica</i>)	3	5	11	8	7:23	7:25
10	Purple Finch (<i>Carpodacus purpureus purpureus</i>)	14	4	9	20	7:23	7:26
11	Crow (<i>Corvus brachyrhynchos brachyrhynchos</i>)	*25	4	141	30	7:23	7:26
12	Mourning Warbler (<i>Oporornis phalaenoptilus</i>)	3	3	10	11	7:25	7:27
13	Golden-crowned Kinglet (<i>Regulus satrapa satrapa</i>)	3	3	81	11	7:24	7:27
14	Goldfinch (<i>Astragalinus tristis tristis</i>)	18	2	12	13	7:26	7:28
15	Black-throated Green Warbler (<i>Dendroica virens</i>)	8	0	111	8	7:26	7:30
	<i>After sunset</i>						
16	Chimney Swift (<i>Chaetura pelagica</i>)	14	1	12	9	7:29	7:31
17	Boy-breasted Warbler (<i>Dendroica castanea</i>)	2	2	5	1**	7:28	7:32
18	Tree Swallow (<i>Iridoprocne bicolor</i>)	7	2	8	5	7:31	7:32
19	Yellow-bellied Sapsucker (<i>Sphyrapicus varius varius</i>)	*2	3	14	8	7:29	7:33
20	Bobolink (<i>Dolichonyx oryzivorus</i>)	5	3	14	5*	7:32	7:33
21	Black-throated Blue Warbler (<i>Dendroica caerulescens caerulescens</i>)	8	4	12	3**	7:29	7:34
22	Northern Parula Warbler (<i>Compsalopsis americana usneae</i>)	3	5	10	7	7:33	7:35
23	Kingbird (<i>Tyrannus tyrannus</i>)	10	5	17	6**	7:31	7:35
24	<i>Pipilo</i>	.	7	7	7	7:32	7:37
25	Redstart (<i>Setopha ruticilla</i>)	13	7	17	1**	7:35	7:37
26	Indigo Bunting (<i>Passerina cyanea</i>)	17	9	20	1	7:37	7:39
27	Blackburnian Warbler (<i>Dendroica fusca</i>)	11	10	17	2**	7:34	7:40
28	Blue-headed Vireo (<i>Laniroo solitarius solitarius</i>)	3	10	29	2**	7:31	7:40
29	Chiff Swallow (<i>Petrochelidon lunifrons lunifrons</i>)	*2	11	15	8	7:41	7:41
30	Canada Warbler (<i>Wilsonia canadensis</i>)	2	11	15	7	7:39	7:41
31	Slate-colored Junco (<i>Junco hyemalis hyemalis</i>)	5	12	19	5	7:41	7:42
32	Olive-sided Flycatcher (<i>Nuttallornis borealis</i>)	1	13	13	13	7:39	7:43
33	Oven-bird (<i>Seiurus aurocapillus</i>)	*2	15	16	14	7:43	7:45
34	Belted Kingfisher (<i>Ceryle alcyon alcyon</i>)	5	15	20	9	7:41	7:45
35	Nashville Warbler (<i>Vermivora rubricapilla rubricapilla</i>)	2	17	22	12	7:42	7:47
36	Bluebird (<i>Sialia sialis sialis</i>)	21	17	24	10	7:45	7:47
37	Magnolia Warbler (<i>Dendroica magnaolia</i>)	4	17	34	1	7:46	7:47
38	Black-billed Cuckoo (<i>Coccyzus erythrophthalmus</i>)	3	22	23	19	7:49	7:52
39	Maryland Yellowthroat (<i>Geothlypis trichas trichas</i>)	2	22	24	19	7:49	7:52
40	Phoebe (<i>Sayornis phoebe</i>)	22	23	39	14	7:51	7:53
41	Song Sparrow (<i>Melospiza melodia melodia</i>)	25	24	31	17	7:52	7:54
42	Chipping Sparrow (<i>Spizella passerina passerina</i>)	5	25	33	19	7:55	7:55
43	Least Flycatcher (<i>Empidonax minimus</i>)	14	26	31	16	7:55	7:56
44	Vesper Sparrow (<i>Passerculus gramineus gramineus</i>)	1	27	27	27	7:54	7:57
45	Barn Swallow (<i>Hirundo erythrogastra</i>)	10	27	34	17	7:56	7:57
46	Savannah Sparrow (<i>Passerculus sandwichensis savanna</i>)	11	27	43	17	7:55	7:57
47	White-throated Sparrow (<i>Zonotrichia albicollis</i>)	3	27	34	16	7:57	8:00
48	Wood Thrush (<i>Hylocichla ustulata</i>)	25	30	39	19	7:57	8:00
49	Wood Pewee (<i>Melospiza virens</i>)	3	31	41	26	8:00	8:01
50	Scarlet Tanager (<i>Piranga erythromelas</i>)	20	33	40	25	8:02	8:03
51	Hermit Thrush (<i>Hylocichla guttata pallasi</i>)	25	33	45	30	8:01	8:04
52	Robin (<i>Planesticus migratorius migratorius</i>)	5	34	45	26	8:01	8:04
53	Alder Flycatcher (<i>Empidonax traillii albornum</i>)	54	34	39	29	8:03	8:05
54	Very Flycatcher (<i>Hylocichla fuscescens fuscescens</i>)	19	35	40	29	8:03	8:05
55	Olive-backed Thrush (<i>Hylocichla ustulata stairsoni</i>)	32	37	49	29	8:05	8:07

* Call-note.

† After sunset.

** Before sunset.

The following table shows the number of students who took the test in each year from 1990 to 2000. The number of students who took the test in each year is shown in the table below.

Year	Number of Students
1990	100
1991	110
1992	120
1993	130
1994	140
1995	150
1996	160
1997	170
1998	180
1999	190
2000	200

Of the fifteen occasions of even-song in the season of 1912 Olive-backed Thrush was the latest singer on eleven, Veery on two, and Hermit on two. Holding position next to the last singer was Wood Pewee on seven occasions, Veery on five, Olive-backed Thrush on two, and Wood Thrush on one. Of twenty-three occasions of 1913 Olive-backed Thrush was the last singer on thirteen, Robin on five, Veery on three, and Hermit Thrush on two. Holding place next to the last singer was Veery on seven occasions, Olive-backed Thrush on six, Robin on five, and Hermit Thrush on five. With the western sky clear and the sunset glow remaining late, even-song has extended once to 8.15 o'clock and 45 minutes after sunset, an unusually late Robin singing a few times at 8.14 and giving final calls one minute later.

The last song of all as recorded on ten occasions in 1912 was given with a variation in time of only three minutes, namely, from thirty-seven to forty minutes after sunset, or between 8.07 and 8.10 o'clock. Twenty-three records of 1913 average 40 minutes after the latest sunsetting or 8.10 for the last note. This indicates how regular in relation to the setting of the sun is the close of even-song, and how unfailingly one of four species of thrushes ends the singing, either the Olive-back, the Veery, the Robin, or the Hermit, with twenty-four chances in thirty-eight that the Olive-back's voice will be the last. One waits in the silence for a time and then withdraws. The birds' night has closed around them.

A REMARKABLE HERMIT THRUSH SONG.

BY HENRY OLDYS.

WHILE filling a lecture engagement at Hanover, N. H., early in May, 1913, I was the guest of Dr. Frederic P. Lord, of Dartmouth College. On the morning of the 6th my host and I visited a point near Pompanoosuc, Vt., where a pair of Pileated Woodpeckers nest annually. We were only partly successful in our quest — we heard one of the birds we were seeking, but failed to catch even a momentary glimpse of either of the pair. This disappointment, however, was far more than compensated for by the fact that as we sat in the mossy woods waiting for the woodpeckers I heard one of the most remarkable bird songs that has come to my ears during my twenty years' study of bird music. The singer, a Hermit Thrush, was in plain sight not more than forty or fifty feet away and gave ample opportunity for careful noting of the song.

The ordinary song of the Hermit Thrush is made up of different phrases each consisting of a sustained basal note followed by a run of higher, more rapid, and lighter notes composing a broken chord whose fundamental tone is the preceding sustained note. The second part of the phrase,—the running notes—suggests the thought that a material chord of glass has been shattered into fine bits and that the crystalline fragments come tinkling down through the leaves. Sometimes other notes than those of the chord are introduced in the run but without destroying the character of the sustained note as the fundamental tone. Illustrations will make this description clearer —



In this song the chord is —



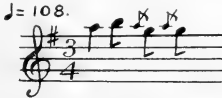
This example is from a record I secured at Hebron, Me., in 1905. Another, taken from a Hermit Thrush in the New York Zoölogical Park —



shows the introduction of a passing note, F, without destroying the idea of the chord —

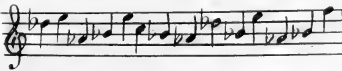


Interspersed with these phrases are very high, light, short phrases that punctuate the others somewhat after the style of the refrain so common in old songs and poems. Thus, the Hebron thrush sang, after the phrase quoted —



which might be interpreted as taking the place of *Fa-la-la-la*.

It must be further explained that the basal notes of the songs are usually more or less unrelated to each other — at least such has been the case in the comparatively few Hermit Thrush songs I have heard. Thus, the consecutive basal notes in a record I had made at Hebron a few days before my visit to Pompanoosuc were —



and so on. It will be noticed that there is no indication here of any normal order of utterance of these notes and the phrases based on them, and that the harmonic progressions of the different chords involved are not such as we commonly find in our own music. This is not to say that the music of this thrush was not attractive — there was a wild beauty in it that was delightful to the ear, — but merely that it shows no close relationship in its modulations to our own music.

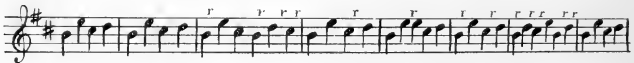
In the song heard at Pompanoosuc, however, there was a very perceptible normal order of the basal notes and their dependent phrases, and that order made a harmonic progression such as completely satisfies the requirements of human music. The basal notes, together with the chords founded on them, arranged in what was palpably the normal order were —



Here we have a very attractive, and at the same time a very human, harmonic progression — from B to E minor, then to A with the minor seventh (C# being the basal note), which leads naturally into D. If this combination of chords be played over and over, with the fact borne in mind that it represents the untaught music of a wild bird, its remarkable character will be well understood.

The principal phrases were interspersed with the light refrain previously mentioned, which did not differ substantially from the form of those noted at Hebron and many other places.

The fact that the order of the harmonies here given was the normal one is abundantly shown by the following extract from a long record I made of the basal notes as the bird sang them — this extract also shows the frequency of the light refrain, which is indicated by the letter *r* (not noted during the singing of the first eight phrases and last four) —



I may have failed to note the light refrain occasionally during the singing of the above; but the record shows the minimum frequency with which it was uttered. I have included in bars the four phrases when sung in normal order. In one instance, it will be observed, the E was repeated, but this does not affect the sequence of harmonies.

In respect to having a normal order and departing from it freely this song resembles several rhythmical songs of Wood Thrushes I have secured, in which the normality of a certain order was very

evident, though variations were frequent. In every case the singer seems to maintain the normal order more steadily after it has gotten into the swing of its singing, so to speak, and when it is not disturbed in the slightest degree — a very little disturbance, such as the distant barking of a dog, is sufficient to disarrange the sequence.

The remarkable character of the song of the Pompanoosuc Hermit Thrush is sufficiently evident to anyone who has any but the dullest ear for music. But I wish to call special attention to the additional proof it offers of the relationship between bird and human music. The chance that the bird happened upon this human progression of harmonies by coincidence is no less remote than that a wild bird — say a Purple Grackle — should utter with perfect pronunciation and inflection the words “My appetite is excellent this morning” through an accidental grouping of articulate sounds. In the case of the grackle we should without hesitation discard the theory of accidental coincidence and assert that the bird expressed itself in human speech. So, too, in the case of the Hermit Thrush must we discard the untenable theory of coincidence and declare that the bird expresses itself in human music.

The notes recorded were sung with great accuracy of intonation — my ear is very keen to detect variations from the true pitch. They were truer to the scale than those of nine human singers out of every ten, and were recorded exactly as given. The song is doubtless exceptional — though I judge that fuller study of the singing of Hermit Thrushes than it has yet received would disclose other songs showing similar harmonic correspondence with our own musical requirements, — but *any* such resemblance to our musical forms as it displays, though but a single instance, would serve to establish relationship between bird and human music, while the large number of recorded instances so far as other species are concerned, makes the principle absolutely impregnable. A little thought will show that coincidence is as much out of the question as in the case of the hypothetical blackbird above mentioned, and that imitation, as an explanation, has as little standing. Astonishing and revolutionary as it may seem, there is no escape from the conclusion that the evolution of bird music independently parallels the evolution of human music and that, therefore, such evolution in each case is not fortuitous, but tends inevitably toward a fixed ideal.

SOME SEASONAL NOTES ON LONG ISLAND BIRDS.

BY HENRY THURSTON AND HOWARTH S. BOYLE.¹

ON the 22d of October, 1907, the Linnaean Society of New York published an abstract containing "A List of Long Island Birds." by Dr. Wm. C. Braislin. Though this list, for which every Long Island bird student feels indebted to Dr. Braislin, is the most complete and best list of Long Island birds that has yet appeared, we have made several observations that more or less extend the seasonal occurrence of certain species as there given and offer them herewith together with certain other notes that may prove of interest to investigators of avian life in this vicinity.

Our notes that extend dates recorded by Dr. Braislin are marked by an asterisk.

***Pisobia fuscicollis*.** WHITE-RUMPED SANDPIPER.—I had a fine chance to see an individual at Mastic, L. I., on August 24, 1912. Mr. J. T. Nichols and I observed another on August 26. (T)

***Numenius hudsonicus*.** HUDSONIAN CURLEW.—Unusually abundant this (1912) season. A flock of fifty by actual count, were seen at Freeport, L. I., on August 4, 1912.

The largest flocks were seen earlier. In company with my brother on July 27, 1912, I saw three large flocks, one composed of one hundred and fifty birds. (T)

***Zenaidura macroura carolinensis*.** MOURNING DOVE.—On the sixteenth of March, 1913, on the Flushing Meadows, Flushing, L. I., I observed one of these birds which I studied for ten minutes or more. Upon clapping my hands the bird flew, disappearing in the mist. (B)

****Circus hudsonius*.** MARSH HAWK.—This bird is a winter resident at Flushing. I have records as follows all from Flushing Meadows: February 24, November 3, November 24, 1912, and January 1, 1913. (B)

***Falco sparverius sparverius*.** SPARROW HAWK.—This little falcon is a winter resident; my note book shows records as follows: December 30, 1911, January 10, November 24, December 7, 8, and 29, 1912. These observations were also made at Flushing Meadows and near vicinity. (B)

****Asio wilsonianus*.** LONG-EARED OWL.—While walking over a frozen birch swamp two miles back of Flushing, L. I., on February 8, 1913, I unexpectedly stumbled upon a roosting place of the Long-eared Owls. As we

¹ Observations made by Mr. Boyle are followed by a B; those by Mr. Thurston have a T appended.

approached the tree in which they were roosting, the birds flew. We remained quietly seated on the roof of a musk-rat house, which was situated beneath the tree and I heard one of the owls give a warble-like note. Presently they began to return. I counted twelve and my companion saw fifteen. We made our exit from under their roost without further disturbing them. The Owls were also seen on February 9 and 15, 1913. (B)

Cryptoglaux acadica acadica. SAW-WHET OWL.—I got my first record for the Saw-whet Owl at Floral Park, L. I., on November 24, 1912. A boy brought in a beautiful immature specimen which he had found dead in the woods. (T)

***Ceryle alcyon alcyon.** BELTED KINGFISHER.—At North Beach, a sandy strip near Flushing, L. I., on the twenty-sixth of February, 1911, I saw a Kingfisher. (B)

***Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.—While sailing out of New York Harbor on the tenth of May, 1912, a Ruby-throated Hummingbird flew aboard the boat while off the lower Staten Island shore and hovered a few minutes around the awnings, finally flying toward the Long Island shore. It was a male bird and undoubtedly made Long Island as I had a strong pair of glasses and was able to follow its flight, which was direct for that shore. (T)

Tyrannus tyrannus. KINGBIRD.—At Mastic, L. I., on August 24, 1912, while walking with Mr. John Treadwell Nichols near his home we observed straggling flocks of migrating Kingbirds that numbered about three hundred individuals. The birds seemed to be following a fixed route as every one would first approach us by flying along the banks of a small stream near which we were standing and upon reaching a point a little above our station branched off and took an inland course.

Kingbirds seemed unusually common on Long Island during the fall season of 1912. (T)

***Corvus ossifragus.** FISH CROW.—A common resident this winter, if not every one. Early in the frosty mornings from my window I can see them journeying with their common black cousins to a garbage dump that lies east of Floral Park. On December 25, 1912, I collected one from a mixed flock of about three hundred birds that descended on our grounds. About seventy-five of this flock were *C. ossifragus*. More were also seen on February 28, 1913, at the same dump. (T)

Sturnus vulgaris. EUROPEAN STARLING.—On the 19th of February at Floral Park, L. I., I saw a flock of Starlings, conservatively estimated to contain five thousand birds.

A habit of Starlings which might be of interest to those who have not witnessed it is that of indulging in mid-night serenades. Several times in the evening, once or twice rather late, I have passed at Hempstead, L. I., a couple of churches with old-fashioned towers that make fine roosting places for numbers of these birds and have always heard them squeaking, hissing or whistling. On March 4, 1913, one was sounding his rich melodious call at the top of his voice, at 10.30 P. M. (T)

Dolichonyx oryzivorus. BOBOLINK.— My first Long Island Bobolinks were seen, in company with Mr. Nichols at Mastic on August 24, 1912. We arose about 4. A. M. and started for a sniping trip in his canoe and it did not take us long to realize that a large migratory flight was on. The air was full of bird calls, shadowy forms of Nighthawks and Whippoorwills dashed by, but chiefly noticeably above all other sounds was the sparkling, silvery "link, link, link" of hundreds of Rice Birds. As dawn approached we could begin to see the flocks pass and most of them were very high. We calculated that eight thousand birds passed over us. The flight was over by 8.30 A. M. (T)

***Zonotrichia leucophrys leucophrys.** WHITE-CROWNED SPARROW.— In a large berry patch at Floral Park, L. I., on October 22, 1912, I saw some strange looking sparrows and immediately collected one which proved to be a juvenal White-crowned Sparrow. There were about thirty birds in this flock and they stayed with us quite late; so late in fact that I collected another, now in Dr. Dwight's collection, on the fifth of November!

Dr. Braislin's latest record for Long Island seems to be October 21 and he also quotes this bird as "rare." I wonder if this is not due to the fact that the immature plumage is not half so well known as that of the adult.

The numbers seen this fall would make the species anything but rare, though of course there may have been an unusually large flight this season. (T)

***Spizella monticola monticola.** TREE SPARROW.— I have the following late records for the Tree Sparrow on Flushing Meadows: April 13, 14, 20, and 21, 1912. Newtown Swamp, April 7, 1912. (B)

***Spizella pusilla pusilla.** FIELD SPARROW.— Several were seen at Floral Park, L. I., on February 15, 1913. This extends either the early date of arrival or, what is more probable, establishes the bird as a winter resident on Long Island. I fail to see why this should not be the case as they reside in New Jersey all winter at practically the same latitude. (T)

***Melospiza georgiana.** SWAMP SPARROW.— On the salt marshes at Flushing, L. I., the Swamp Sparrow may be found on almost any day during the winter. The short bushes that cover the higher places form excellent shelters for the birds. Dates as follows: December 7, 8, 29, 1912, and February 15, 1913. (B)

***Passerella iliaca iliaca.** FOX SPARROW.— During the winters of 1911 and 1912 the Fox Sparrow was often seen. Some records from Flushing Meadows: Feb. 22 and 26, December 3, 1911, January 20, December 7 and 8, 1912. These sparrows were also seen at Jamaica, L. I., on January 20, 1912. (B)

***Lanius ludovicianus migrans.** MIGRANT SHRIKE.— Unusually common around Floral Park during the fall migration of 1912. I collected three individuals and several others were seen. The dates of collection were September 13, October 1, and October 22, 1912. (T)

***Vermivora chrysoptera.** GOLDEN-WINGED WARBLER.— One observed at Flushing, L. I., on May 12, 1912. It was watched for nearly a half an hour. (B)

***Dumetella carolinensis.** CATBIRD.— On November 2 and 10, 1912, a Catbird, apparently in fine condition, was seen at Flushing, L. I. (B)

***Regulus satrapa satrapa.** RUBY-CROWNED KINGLET.— On September 30, 1911, a large flight of these Kinglets was observed in a patch of woods near Forest Hills, L. I. (B)



NOTES ON THE OCCURRENCE AND NESTING OF CERTAIN BIRDS IN RHODE ISLAND.

HARRY S. HATHAWAY.

DURING the interval which has elapsed since the publication of the 'Birds of Rhode Island' by Howe and Sturtevant in 1899, and the Supplement thereto in 1903, many records of rare and interesting birds have accumulated and are herewith published as a contribution to our knowledge of the avifauna of this state. The Western Willet, Arctic three-toed Woodpecker, Evening Grosbeak, and Nelson's Sparrow have been added to the list of the birds of the state. The breeding of Henslow's Sparrow, Black-throated Blue Warbler, Pine Warbler, Water Thrush, Winter Wren and Hermit Thrush has been established, while an increase in numbers of the Laughing Gull, Common Tern, Sparrow Hawk and Carolina Wren has been noted.

I am greatly indebted to Messrs. Charles B. Clarke, of Newport, Harry S. Champlin of Point Judith, Israel R. Sheldon of Pawtuxet, Miss Elizabeth Dickens of Block Island, and others for specimens and valuable notes, and I take this opportunity of expressing my sincere thanks to them.

Gavia stellata. RED-THROATED LOON.— Adult birds are rarely seen on our coast. A male in full nuptial plumage was taken off Newport on the late date of May 21, 1908, by Mr. C. B. Clarke.

Cephus grylle. BLACK GUILLEMOT. An extremely rare and irregular winter visitant. Additional records are as follows. A male shot January 1, 1906 off Sakonnet Point, a female December 30, 1906, at Newport and a male November 28, 1909, at Cormorant Rock off Newport. These birds, all in the gray winter plumage, were collected by Mr. C. B. Clarke and

the last two are in my collection. Mr. Clarke writing of their habits says, "I shot five birds in all in 1909 at Cormorant Rock, all single birds shot over duck decoys. They decoyed readily, but I do not know whether they would alight to them as I never gave them a chance. I have, however, before this, seen them swimming in the water, resembling a grebe very much but they are somewhat quicker in diving. One that I shot was under water before the shot got there and when he came up he was flying. He did n't go very far for the next shot brought him down."

Alca torda. RAZOR-BILLED AUK.—A male was sent me in the meat, shot by Mr. C. B. Clarke at Newport on January 9, 1909. This bird was minus a tarsus and foot lost in early life. Upon skinning I found eighteen "Silver sides" (*Menidia gracilis*) a small fish two to three inches in length, in its gullet.

Stercorarius pomarinus. POMARINE JAEGER.—One seen chasing a Tern on August 9, 1909, at Quonochontaug. Jaegers were fairly common during August and early September, 1910. The first ones noted were seen August 18th, at Quonochontaug, and three or four followed the Terns every day, making them drop the fish they were carrying to their young, which the Jaegers quickly secured. Eight were the most seen in a day, on August 26th. I have referred them to this species as being the commoner one in our waters. Two immature birds and an adult in fall plumage, shot at Point Judith on September 13, 1910, by Mr. H. S. Champlin, were sent to me in the meat.

Stercorarius parasiticus. PARASITIC JAEGER.—An additional record for this uncommon migrant is one taken by Mr. C. B. Clarke at Eastons Pond, Newport, on the late date of November 27, 1909. It was sent to me in the meat in a very emaciated condition.

Larus atricilla. LAUGHING GULL.—Formerly a rare migrant, this bird has rapidly increased in numbers since 1909 and during August and early September of 1912 it was fairly common along the south coast of this state, most of the birds being in immature plumage. An adult bird appeared off Quonochontaug on August 7, 1909, and up to the 27th of that month seventeen individuals were seen at various times in company with the Common Terns with which they mingled on the sand flats in Quonochontaug Pond. I shot a young female August 21, 1910, in this locality. Eight birds, the first noted in 1912 at Quonochontaug, were flying west along shore on August 4th. On the afternoon of August 19th a flight of Herring Gulls occurred on our coast and among them I saw about twenty Laughing Gulls in bunches of twos and threes all flying in a southwesterly direction toward Long Island Sound. Mr. Israel R. Sheldon reported that there were on August 22, 1912, about one hundred Laughing Gulls with at least two thousand Common Terns at Point Judith. An adult male and female were shot May 17, 1908, at Point Judith by Mr. C. B. Clarke and on May 26, 1912, I saw three adults on the Sakonnet River near Tiverton.

Sterna hirundo. COMMON TERN.—The protection given the Terns on their breeding grounds has led to a notable increase in their numbers along

our coast since 1907. Early in August of each year since, both old and young birds appear in daily increasing numbers, coming to the sand flats in Brightman, Quonochontaug and Charlestown Ponds and the breakwater at Point Judith where they find safe roosting places. Adult birds are flying back and forth all day over the ocean and ponds bringing small fish to the young birds congregated on the flats, and as the young get stronger of wing they accompany the adults on their fishing trips. On August 17, 1910, there were about a thousand birds on the Quonochontaug flats, and from information gathered from others, I estimated that there were at least seven thousand birds between Point Judith and Watch Hill daily during August, 1910. They all departed between September 5th and 8th. A large flight occurred on September 2, 1911. From early morning until sunset flocks of from five to sixty coming from the east, were flying continuously over the ocean and Quonochontaug Pond in a south-westerly direction. After this but few were noted, a lone individual being seen on November 5th. There must have been a great many thousand birds in this flight. During 1912 they were not as abundant as in the two previous years, but still were very plentiful.

***Sterna fuscata*.** SOOTY TERN.—A male in immature plumage was shot by Mr. C. B. Clarke on January 8, 1908, at Coddington Point, Newport, and is now mounted in my collection. This is the fourth record for this state. It is rather remarkable that a southern bird should stray so far north in winter.

***Hydrochelidon nigra surinamensis*.** BLACK TERN.—A flight of this species occurred on September 3, 1906, at Point Judith lasting nearly all day. The wind blew about thirty miles an hour from the southwest accompanied by rain. Small flocks were flying over the Point every few minutes coming from the northeast and flying into the wind. Late in the afternoon the wind shifted to light northwest and the flight ceased, but with the change in wind the terns commenced to appear in great numbers over the ocean coming from the southwest and leisurely feeding between Point Judith and Newport. The next morning none were seen, all having departed in the night. I shot a male in nearly adult plumage, the only one seen, all the others being immature birds.

***Puffinus borealis*.** CORY'S SHEARWATER.—Six of this species were shot from the deck of a tug boat between Watch Hill and Point Judith in Block Island sound on October 14, 1907, by Mr. C. B. Clarke. One was shot at Point Judith by H. S. Champlin on September 13, 1910. Mr. Champlin informs me that they were quite numerous in August and early September in company with Jaegers, inside the breakwater.

***Anas rubripes*.** BLACK DUCK.—A nest containing nine fresh eggs was found in the marsh at Point Judith on May 7, 1911. The female a small bird with green legs, flushed when I was about eight feet from her. On May 29, 1910, I found five young about three weeks old in the same marsh, two of which were caught with the aid of a dog and after banding, were liberated. Miss Elizabeth Dickens of Block Island informs me that she

had a pure white albino in her flock of twenty-three domesticated Black Ducks.

Chaulelasmus streperus. GADWALL.—This is one of the rarest ducks that visit us in the fall there being but two or three records of its occurrence in the state. An immature male was shot in a small fresh water pond at Point Judith on November 11, 1909, by Mr. Leon Champlin, from whom I secured it in the meat for my collection. The bird was alone at the time.

Mareca americana. BALDPATE.—While a few of this species are taken every fall on our coast it is uncommon in winter and early spring. A male and female in full nuptial plumage were shot by Mr. C. B. Clarke near Newport on March 19, 1909. Both birds were added to my collection. Mr. Harold N. Gibbs shot a female at Barrington on January 21, 1913.

Spatula clypeata. SHOVELLER.—The following records of this rare migrant are of interest. A young female was shot at Point Judith, September 24, 1908, and an immature male at Newport, November 7, 1908, by Mr. C. B. Clarke. A male and female in full nuptial plumage were shot in a small fresh water pond at Point Judith on April 29, 1911, by Mr. Leon Champlin who sent them to me in the flesh. They had been observed for a week previously in this pond in company with a pair of Black Ducks.

Marila valisineria. CANVAS-BACK.—A few are taken every fall in Charlestown Pond in company with the large flocks of Redheads that occur there more or less regularly in November. Two males in adult plumage were shot in a fresh water pond in Middletown, R. I., on November 18, 1905, one of which is in the Park Museum in Providence and the other in my collection.

Histrionicus histrionicus. HARLEQUIN DUCK.—Mr. C. B. Clarke informs me that he saw a bunch of a dozen in December, 1904, in the vicinity of Cormorant Rock, Newport, and that he shot two immature males on December 17, 1905, at the same locality. He had a very good chance to watch this pair as he lay concealed behind a rock. Speaking of their habits he says, "they are the most graceful birds in the water that I ever saw. They have a very peculiar way of swimming, moving along in a zigzag manner with their heads bobbing up and down as if in search of food. The rougher the water the better they seem to like it. Most ducks will dive through a breaker but the Harlequin swims right through as if the breaker did not exist." Mr. C. M. Hughes of Newport informed me that an adult male, two immature males and a female were shot at Cormorant Rock, Newport, on February 9, 1911. I purchased the adult male which is in full nuptial plumage.

Somateria spectabilis. KING EIDER.—This species occurs rarely among the flocks of American Eiders that resort to the vicinity of Cormorant Rock, Newport. Mr. C. B. Clarke during some fifteen years shooting at this locality has taken three specimens in that time. Two of these are in my collection, a male in post nuptial plumage of a mature bird probably two years or more old, shot January 21, 1909, and a female taken February 16, 1911.

Chen hyperboreus hyperboreus. LESSER SNOW GOOSE.— One of this species in immature plumage was shot on January 10, 1909, near a spring on Hope Island in Narragansett Bay and is now in the collection of Dr. Horace P. Beck of Newport, mounted on a panel as a "dead game" piece. The bird was in a very emaciated condition with its stomach empty, and when skinned was found to have one of its wings recently broken, and while it was quite well knit together, probably accounts for its being in this locality in midwinter. It measured as follows: wing 16 inches, tarsus 3.37 inches, bill 2.25 inches.

Olor columbianus. WHISTLING SWAN.— Two were seen by one of the Life Saving Crew at the Quonochontaug Station flying west over the ocean in October, 1908. Mr. Frank D. Lisle of Providence, on September 7, 1910, saw a swan in Trustom Pond in South Kingstown, gray in color with reddish head and neck. He watched it for some time through field glasses until it flew away. Mr. C. B. Clarke wrote me that during the first week of September, 1910, a swan flew over the marsh at Point Judith. In all probability the above were of this species. Miss Elizabeth Dickens of Block Island has given me the following information in regard to six swans that were shot on November 16, 1911, in Fresh Pond, the largest fresh water pond on the island. She says, "the wind was blowing at least 50 miles per hour from the west and they had alighted in the pond. Mr. Howard Stedman shot two of them, young birds which still retained a part of their gray plumage. L. Lewis Littlefield shot the remaining four, which had flown to the farther end of the pond when the first two were killed. He ended the lives of two adult birds with the first shell. The two that were left arose, but soon alighted beside the dead ones on the surface of the pond where Mr. Littlefield killed them also. Two of the six were sent to Newport, one of which was mounted and is in the possession of Mr. Clarke Burdick. The others were plucked and eaten. A seventh bird was killed in Harbor Pond, Block Island, December 28th or 29th, 1911, by Lycurgus Negus. It is a nearly adult bird still retaining gray feathers on the head and neck." This one was mounted and is now in the Park Museum at Providence.

Ardea herodias herodias. GREAT BLUE HERON.— A very interesting account of the flights of this heron on Block Island was recently given me by Miss Elizabeth Dickens. "On November 12, 1910, a flock of twelve appeared about 8:30 A. M. After circling awhile like gulls playing in air, they dropped down on the edge of the bluff, and they were a sight. Of course the gunners got after them and they departed. All the forenoon they came from the west in flocks of from two to sixty. I counted forty in one flock and sixty in another, that were in sight at one time. The Life Savers said this was one flock until their shooting divided them. Last fall, 1911, there was a similar flight though not so large, at about the same time."

Rallus elegans. KING RAIL.— Three records of this large rail all taken in winter are given by Howe & Sturtevant in their 'Birds of Rhode Island.'

Since these were recorded a number of specimens have been taken all in summer and fall, as follows: a male and female were shot May 3, 1904, and a male May 9, 1904, all at Eastons Pond, Newport, by Mr. C. B. Clarke. On October 13, 1907, Mr. H. S. Champlin of Point Judith, while searching in the long marsh grass for a duck he had just shot, stepped on and caught a female of this species. This specimen was sent to me in the meat. Mr. C. B. Clarke sent me four birds in 1909 from Point Judith shot on the following dates, August 26th, a female, September 3rd, an adult male which was moulting, patches of chestnut being mixed with worn gray feathers on the throat and breast; September 12th, a male and December 12th, a male. With the exception of the one that was moulting the others were in fresh plumage and I think were birds of the year. Mr. Clarke informed me that they were all shot in the "cattails" in the vicinity of a fresh water puddle and from the manner of their occurrence is led to believe that a pair nested.

Rallus virginianus. VIRGINIA RAIL.—This rail nests much earlier than is usually supposed. On June 4, 1906, I found a nest at Quonochontaug with one young and three eggs pipped, which were empty upon my return in an hour. May 26, 1907, a nest was found at Point Judith with eight eggs, four of which were within two days of hatching, three would have hatched in four days and one was infertile. May 29, 1910, at Point Judith, with the aid of a dog I caught two young at least two weeks old and another was seen running through the cattails. The eggs from which they were hatched must have been laid late in April.

Porzana carolina. SORA.—The Sora is rarer than the Virginia Rail in the breeding season in this state. A nest with fourteen eggs was found June 17, 1906, at Point Judith by H. S. Champlin. The nest was visited again on the 19th when it was found empty, the eggs having hatched in the meantime. On May 29, 1910, I found a nest with nine fresh eggs at Point Judith near a small fresh water pond. It was built in a small clump of "cattails" in a very open spot and readily seen from all sides.

Coturnicops noveboracensis. YELLOW RAIL.—The Yellow Rail occurs quite regularly during the fall migration. The following records of birds all secured at Point Judith are of interest. Mr. C. B. Clarke shot two October 10, 1908, and Mr. William T. Bowler took two more on October 15th of the same year. These birds were not saved. October 15, 1909, Mr. Clarke took a male which he sent to me and it is now in my collection. Four were killed in October, 1910, by Mr. William T. Bowler. September 30, 1911, a female was shot by Mr. Charles L. Knowles in a fresh water run, and on October 1, 1911, another specimen was caught by a dog and one other seen. The last two birds were sent to me in the meat by Mr. I. R. Sheldon who writes as follows. "I do not think the Yellow Rail is anywhere near so rare as recorded. Out of thirty rails that I have seen this fall at Point Judith, four were this species, ten Virginias and sixteen Soras. They are very hard to flush and for this reason I think less rare than supposed to be. I have caught two birds with my hands." Mr. W. T. Bowler shot one, October 15, 1911, at Newport.

Steganopus tricolor. WILSON'S PHALAROPE.—I took a male of this rare Phalarope at Quonochontaug on August 28, 1909. It came into my decoys at dusk, and alighted among them.

Macrorhamphus griseus scolopaceus. LONG-BILLED DOWITCHER.—A female of this rare shore bird was shot on September 25, 1908, by Mr. C. B. Clarke at Point Judith, which he sent to me in the meat and it is now in my collection. It measured as follows: wing 5.87 inches, tarsus 1.65 inches, bill 2.87 inches. Mr. Clarke informs me that twelve or fourteen years ago he shot a bunch of eleven of this species in the spring of the year on the Eastons Beach marsh at Newport, and that the above specimen is the only one he has seen since that time.

Micropalama himantopus. STILT SANDPIPER.—Some years this species occurs quite commonly during the fall migration and in others it is rare. During a flight at Point Judith on September 1, 1906, several were shot, all young birds. I shot a male in adult breeding plumage that came to my decoys on July 30, 1911, at Quonochontaug, R. I.

Pisobia maculata. PECTORAL SANDPIPER.—I took a very late bird at Point Judith marsh on November 2, 1902, the only one seen.

Pisobia bairdi. BAIRD'S SANDPIPER.—As this is one of our rarest Limicolae, individual records are of interest. I took a male August 14, 1907, and a female August 30, 1912, both at Quonochontaug. The latter was alone and came to my decoys when I imitated the call notes of the Pectoral Sandpiper.

Ereunetes mauri. WESTERN SANDPIPER.—Occurs sparingly among flocks of Least and Semipalmated Sandpipers. Out of a flock of a dozen "peep" I shot a young male on September 7, 1908, at Point Judith. At Quonochontaug in 1912, I shot three, a female August 23, a male each on August 24 and 26. These were all immature birds which were easily identified by their longer bills as they searched for food on the sand flats, among the flocks of "peep."

Limosa fedoa. MARBLED GODWIT.—An extremely rare straggler in this state. One was shot by a gunner named Merritt on September 7, 1908, at Sakonnet Point. The specimen was mounted and is in his possession.

Catoptrophorus semipalmatus inornatus. WESTERN WILLET.—The western form of the Willet has never been recorded as occurring in Rhode Island, yet doubtless all that have occurred in recent years belong to this subspecies. It occurs as a regular fall migrant, some years more abundant than others. The first bird that I have a record of, I shot on August 9, 1905, at Quonochontaug. A flock of eight came to my decoys on August 18, 1907, at the same place, two of which I shot, both females. In August, 1912, they were more abundant than I have ever seen them, some eighteen having been seen between the 9th and 23rd on the Quonochontaug marsh. Mr. I. R. Sheldon informed me that he saw twenty-five August 23 on the Point Judith marsh. All of the birds that I have shot were in immature plumage. Earliest bird noted on August 5, 1906. I have

never seen one of the eastern form in this state and do not know of any in local collections.

Machetes pugnax. RUFF.—Mr. William T. Bowler shot an immature female on September 7, 1909, on the Point Judith marsh, which was in company with two Pectoral Sandpipers. This is the third record for the state and is now in my collection.

Tryngites subruficollis. BUFF-BREADED SANDPIPER.—Additional records for this rare fall migrant are as follows: Mr. I. R. Sheldon shot one near the "causeway" on the island in Point Judith Pond on September 2, 1905. Mr. C. B. Clarke shot a female September 23, 1904, at Little Compton, which I purchased of him for my collection. He took another specimen at the same locality on the early date of July 22, 1906.

Charadrius dominicus dominicus. GOLDEN PLOVER.—This fall migrant is fast becoming one of our rarest shore birds. In August and September of 1909, quite a number were taken on the Point Judith marsh. I have two females, shot August 21, and a male and female shot August 30, of that year which are in worn breeding plumage and moulting. About half of the feathers on the throat and belly are black, the rest white, giving the bird a mottled appearance. Mr. C. B. Clarke who obtained the birds informed me that during fifteen years shooting he has seen but very few in this plumage.

Ægialitis meloda. PIPING PLOVER.—The Piping Plover is an extremely rare summer resident and migrant in this state. A pair have bred for five years on a pebbly beach in Newport County. I was informed of their presence at this spot in 1908, and visited the locality on June 4, 1909, readily found the adults and judged from their actions that they had young. In 1910 I paid them a second visit on June 19, and after a wait of an hour under a blind, I saw three young a few days old running along the beach. June 4, 1911, I found them in the same spot and the female led me a chase of a hundred yards, acting as if she had a broken wing. I spent an hour under the umbrella blind, and at last saw two young less than a week old feeding along the sandy beach. The old birds did not come near the young at any time and were very wary. My last trip was on May 26, 1912, found the birds as usual, and hiding under the blind, in less than three minutes the female ran up the beach beyond high water mark and vanished from sight among the pebbles, which she so closely resembled in color. It took me but a moment to reach the spot where I saw her fade from sight, and there in a slight hollow in the sand on a few pieces of broken shells were four eggs, which I photographed. It is remarkable, that one of the Limicoke family, which has to run the gauntlet of such a host of gunners in their migration, should safely return to nest year after year in the same identical spot.

Ectopistes migratorius. PASSENGER PIGEON.—There is no definite breeding record that I can find of this bird though it formerly bred here in abundance. In Forbush's 'History of the Game Birds, Water Fowl and Shore Birds' on page 346 I find "Roger Williams (1643) says that the

Pigeons bred abundantly in Rhode Island in the Pigeon Country." Mr. F. T. Jencks of West Barrington, R. I., our veteran ornithologist, has written me as follows: "Once in West Greenwich, a Wild Pigeon flew from a pine tree to another near by and I shot it, a beautiful male. I went and looked where he flew from and found a nest with one egg which I took. I don't remember what disposition was made of these specimens. It was close to 1880, probably in May, but more likely before 1880 than afterward. Shooting Wild Pigeons and Mourning Doves are two different propositions, the first was easy the latter generally not." I have in my collection a mounted adult male taken on the "Whittaker" grounds in Cranston in October, 1854, by Percia Aldrich and mounted by him. What is undoubtedly the last one shot in this state is a young bird taken by Walter A. Angell November 2, 1886, in Cranston, now in my collection. Mr. William A. Sprague, of Providence, saw one sitting on a telegraph wire in Glocester on September 25, 1888, which allowed a near approach and remained on the wire until he was some distance away. This is the last instance that I know of its occurrence here.

Cathartes aura septentrionalis. TURKEY VULTURE.—I have a mounted specimen in my collection shot by Le Roy Knowles at Point Judith on June 16, 1908. When first seen the bird was perched on a stone wall and appeared to be much interested in Mr. Knowles' chickens. Fearing that the vulture might molest them, Mr. Knowles shot him. Miss Elizabeth Dickens has written me that one was shot on Block Island, April 12, 1912, and was mounted and in the possession of Lycurgus Negus.

Falco peregrinus anatum. DUCK HAWK.—The following very interesting account of the occurrence of this species on Block Island was given me by Miss Elizabeth Dickens. "Grey Bonnet" the tyrannus falcon, appeared here April 26, 1912. He is a foeman worthy of my steel, but I've never been able to kill one yet although I have made the feathers fly a number of times. One can't but admire his wisdom and cunning, and the wonderful feats he performs in air. They are very common with us both spring and fall. Have recorded forty-six during the fall of 1912."

Falco sparverius sparverius. SPARROW HAWK.—Recorded by Howe & Sturtevant in 'Birds of Rhode Island' as an uncommon summer resident. There has been a decided increase in their numbers during the last ten years, and now they may be called a regular summer resident, breeding locally and often wintering. I took a set of four fresh eggs on May 26, 1903, in Warwick which were laid in a hollow cavity in a dead tree. A pair occupied an old woodpecker's hole in the side of an ice house in Cranston and on May 24, 1907, I found a set of five eggs incubated ten days. The female would not leave the nest and I had to remove the eggs from under her with a scoop net. Another pair were in an old flicker's hole in a telegraph pole eight feet up, beside a much travelled highway in Cranston. It contained four fresh eggs on May 14, 1911. The bird was in the nest and would not leave. Inserting a scoop net she struck at and grasped it with her feet and was pulled out clinging to it. I saw two individuals in Janu-

ary, 1911, and a pair which were apparently mated, on February 22, of the same year, all in Warwick.

Cryptoglaux acadica acadica. SAW-WHET OWL.—An additional record of this rare winter visitor is a female taken on November 1, 1910, at Point Judith by Mr. H. S. Champlin.

Picoides arcticus. ARCTIC THREE-TOED WOODPECKER.—An adult male was shot in Barrington on December 25, 1905, by a boy from whom it was purchased by Angell & Cash, taxidermists in Providence. While in a grove of pitch pines on Potowomut Neck in Warwick on February 22, 1911, I saw one of this species busily engaged in digging out a grub from the trunk of a dead pine tree. I fired at the bird but he flew off unhurt. I returned to this tree later on and found the bird at work, fifteen feet up the trunk. He did not mind my presence in the least and let me approach the foot of the tree. Another attempt to collect it was unsuccessful and I did not see the bird again. These are the first two instances of their occurrence in this state.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—I saw one perched on the topmost limb of a large dead white pine in Charlestown on June 5, 1910. When some distance from the tree I heard its loud call notes and upon approaching, it flew out of sight. This is the first one I have ever seen and it is an extremely rare migrant with us.

Corvus brachyrhynchos brachyrhynchos. CROW.—Dr. H. P. Beck of Newport kindly permits me to record an albino that was killed on Prudence Island in December, 1910. The bird is mounted in his collection.

Sturnus vulgaris. STARLING.—This old world species first introduced into New York City made its appearance in this state at Silver Spring in East Providence in the summer of 1908. I was informed of their presence here by Mr. I. R. Sheldon who saw seven or eight birds and said they had nested there that summer. I saw a flock of thirty-two in an elm tree in Warwick on December 17, 1911. Prof. H. E. Walter of Brown University told me of seeing seven on April 2, 1912, in East Providence and that he saw two enter holes in trees. During December of 1912 about a dozen were reported as roosting in the steeple of the church in Rumford. Miss Elizabeth Dickens wrote me that her father saw the first Starling on Block Island on October 2, 1912, and on November 23, 1912, a flock of twenty were seen.

Molothrus ater ater. COWBIRD.—A male and female were seen on Block Island, January 10, 1913, by Miss Elizabeth Dickens. The weather had been very mild up to this time.

Euphagus carolinus. RUSTY BLACKBIRD.—Two of this species were feeding along the banks of a running brook in Warwick on February 4, 1912, one of which I secured, a male now in my collection. The weather had been very severe during January, and all nature was encased in snow and ice. This is the first record for this bird wintering with us.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.—Miss Anna E. Cobb reported having seen a male on January 7, 1911, in Meshanti-

cut Park, Cranston. A flock of five females and two males were observed in Woonsocket on January 13, 1911, and for several days thereafter, as recorded in the March-April 1911 "Bird-Lore." These are the first instances of its occurrence in this state.

Loxia leucoptera. WHITE-WINGED CROSSBILL.—A flock of forty of this uncommon winter visitor were reported feeding on hemlock cones in Johnston, November 20, 1906. I visited this locality on November 24 and secured three females from a flock of twenty-four. On December 22 I shot two males at the same place and saw twelve others. They were last seen on January 13, 1907. Five females were on the ground under a large hemlock picking up the seeds that had fallen from the cones. They were very tame and allowed me to come within two feet of them before they flew into the lower branches of the tree.

Passerherbulus henslowi henslowi. HENSLOW'S SPARROW.—A rare local summer resident occurring only in the southern part of the state but principally in the town of Charlestown. Perched on a weed stalk, fence, stone wall or rock in some old pasture grown up to weeds and briars, its plain little song resembling the words "se-lick" may be heard at all hours of the day during the breeding season. I heard two males singing at Bridgetown, May 10, 1903, one August 5, 1905, near Niantic, two at Quonochontaug May 11, 1906, one May 9, 1909, at Kingston, and May 13, 1910, in a field of some twenty acres in extent in Charlestown I heard seven singing. On June 5, 1910, I visited the Charlestown locality, and with the aid of my son C. H. Smith Hathaway we dragged the fields with a rope in an endeavor to find a nest, but with no result other than to collect two males. In 1911 on May 28th, my son and I again dragged the old pasture, and we had not proceeded more than a hundred feet when a female flushed from a nest containing three fresh eggs and one of the Cowbird. We left the eggs unmolested, continued our dragging and in about two hours flushed another female from a nest with four eggs in exactly the same situation as the first one, set in a cluster of dead grass and very open to view. The nests were built entirely of grasses lined with fine dead grasses, quite deeply cupped. I endeavored to collect the last female but was unsuccessful. She led me a long chase, flying low from one clump of bayberry bushes to another and instantly diving out of sight, finally disappearing. One very distinctive character noted was the chestnut brown color of the bird in flight. The last set found was incubated some seven or eight days. Returning to the first nest I carefully approached and succeeded in getting within two feet of it. The bird was on, in plain sight, and I could see the olive green feathers of the nape and the chestnut brown of the back with black streaks. In attempting to touch her she sprang six feet into the air fliriting and spreading her sharp pointed tail feathers, and flew in a zigzag manner into a nearby bayberry bush. In each instance the males were singing within a hundred feet of the nest. These are the first records of its breeding in this state.

Passerherbulus nelsoni nelsoni. NELSON'S SPARROW.—Nelson's Sparrow occurs rarely during the fall migration in company with the

Acadians. One which I shot October 15, 1905 in the Charlestown Beach marsh was kindly identified by Mr. William Brewster as "nearly typical" of this subspecies. I am indebted to Dr. C. W. Richmond of the U. S. National Museum for the identification of a male which I took at Quonochontaug on October 17, 1909. These are the first records for this state and both specimens are in my collection.

Passerherbulus nelsoni subvirgatus. ACADIAN SHARP-TAILED SPARROW.—A common fall migrant along the coast occurring in all the salt marshes. I have two males and a partial albino which I shot October 15, 1905, in the Charlestown Beach marsh, and a male shot October 8, 1911, at Quonochontaug. It doubtless occurs as a spring migrant, but I have no record.

Passerherbulus maritimus maritimus. SEASIDE SPARROW.—Occurs as an uncommon summer resident in nearly all of the salt marshes on our southern coast, variable in numbers in different years, due no doubt to the flooding of the marshes by rain. Two nests were found at Quonochontaug, June 16, 1907, one containing three eggs nearly ready to hatch, and the other with four eggs incubated eight days. The latter set is in my collection. The nests were well concealed in the short coarse dead marsh grass, just above the surface of the shallow water that covered a small part of the marsh to a depth of three or four inches. I took a female October 3, 1909, at Charlestown Beach, and a male October 12, 1912, at Quonochontaug.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—Winters occasionally. I saw five at Apponaug on February 12, 1911, feeding on the fruit of the barberry (*Berberis vulgaris*). Two were seen in a "cattail" swamp in Cranston, December 25, 1912, in company with a small flock of Tree Sparrows.

Progne subis subis. PURPLE MARTIN.—The cold rainstorms of June, 1904, nearly exterminated the martins in this state. They have never regained their former abundance and I know of but few that nest with us. Doubtless, they would increase if suitable houses were put up to attract them. A small colony of a dozen pairs occupies bird houses in Shannock regularly every summer. I took a fresh set of five eggs on June 10, 1911, from a bird house in Charlestown which had two pairs for tenants.

Lanius ludovicianus migrans. MIGRANT SHRIKE.—A rare migrant. At Quonochontaug, August 14, 1903, while perched on the limb of a dead tree, one was busily engaged eating a large grasshopper. It allowed me to approach within a few feet giving a good opportunity to identify it. Mr. F. T. Jencks shot one in Barrington on September 3rd of the same year. I saw one on a telephone wire August 26, 1912, at Quonochontaug but was unable to secure it. Miss Elizabeth Dickens of Block Island, in August, 1912, found one dead, killed by flying against a telephone wire, and saw five others.

Vermivora celata celata. ORANGE-CROWNED WARBLER.—A male of this very rare migrant was shot by the late James W. Stainton in Cranston on May 17, 1892. It is now in the collection of Rhode Island birds in the Park Museum at Providence.

Dendroica caerulescens caerulescens. BLACK-THROATED BLUE WARBLER.—I first heard the song of this dainty little warbler on June 10, 1906, in a grove of white pines, hemlocks, and deciduous trees bordering on a swamp in the town of Burrillville. Beneath the trees a luxuriant growth of mountain laurel was just coming into bloom, and it seemed such a favorable locality for the birds to breed in, that I instituted a search for a nest, but did not succeed in finding one. I was in this locality on June 26, 1910, heard three males singing, and saw a female feeding a young Cowbird much larger than herself. May 30, 1911, I spent several hours hunting for a nest, found two old ones in low laurels and was on the point of abandoning the search, when a female flew up in front of me from her nest. It was built in the forks of a small laurel, ten inches above the ground, and contained four nearly fresh eggs. I sat down near the nest, and after a few moments, both male and female came within a few feet, giving me a good opportunity to study them at close range. This is the first record of its breeding in this state. A mile south of this locality I heard two more males singing on the day the nest was found. June 16, 1912, I heard three males singing in laurel growths in Exeter. It may now be called a rare local summer resident, breeding along the western border of the state.

Dendroica vigorsi. PINE WARBLER.—The first authentic record of the breeding of this warbler was published in 'Bird Lore', Vol. XIII, no. 4, p. 187. I found a nest on May 27, 1911, in Coventry, containing five young a day or two old.

Seiurus noveboracensis noveboracensis. WATER-THRUSH.—Three or four pairs breed regularly each year in the swamp in Washington County where I first found their nest as described in 'The Auk' of October 1906. They are not as plentiful as at that time, due doubtless to the fact that the soil has almost completely fallen out of the roots in which they built their nests. A fresh set of five eggs was found at this locality on May 18, 1912.

Icteria virens virens. YELLOW-BREADED CHAT.—Miss Elizabeth Dickens writes me that on August 22, 1912, there was a migration of Chats on Block Island, she having seen as many as fifty in a flock.

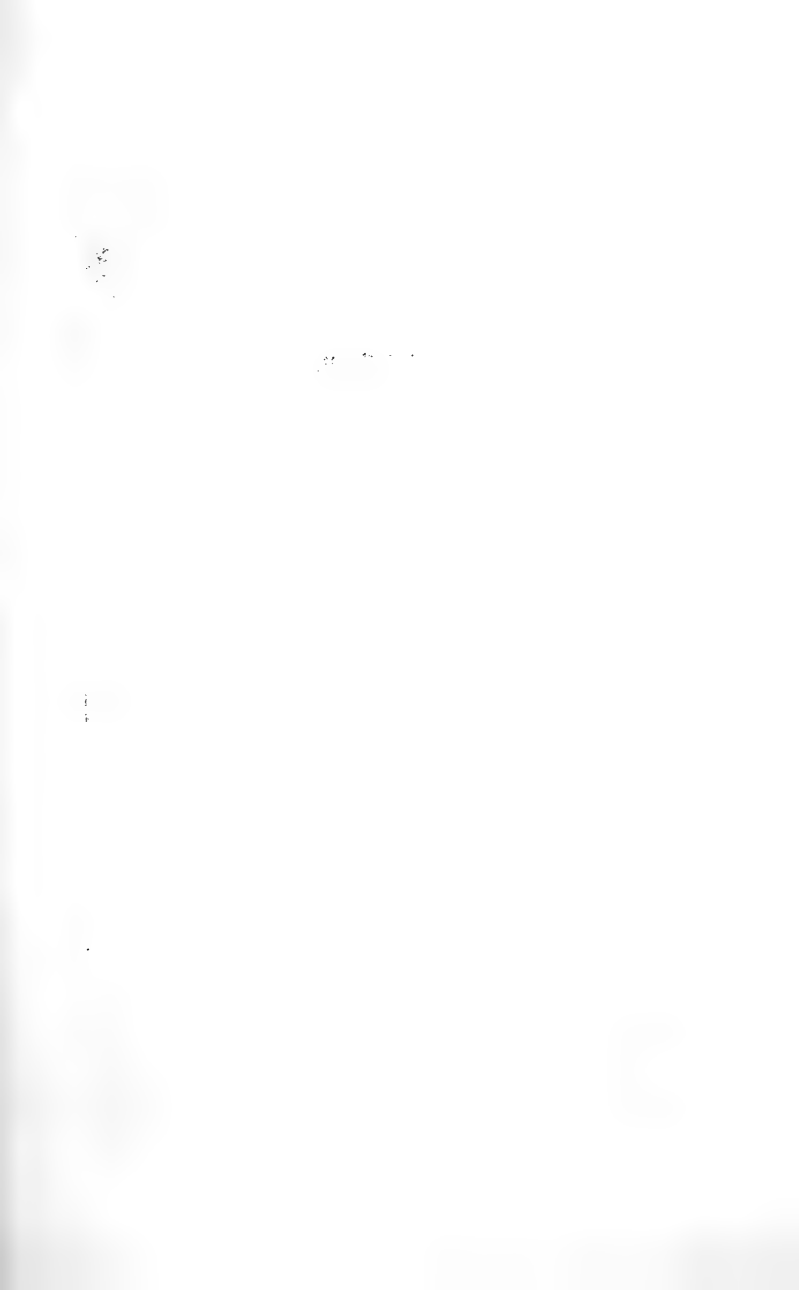
Thryothorus ludovicianus ludovicianus. CAROLINA WREN.—This species has increased in numbers during the last few years and may now be called a rare local summer and winter resident. Dr. Leon J. Cole informed me that he had heard two singing in Kingston, near Dr. Hadley's residence on April 3, 1910. I visited this locality on April 23rd and found one of the birds singing its loud "tea kettle" song from the topmost limb of a maple tree. Mr. E. D. Keith informed me that he had heard one singing on different days during February and March, 1911, in the Roger Williams Park swamp in Providence. Mr. R. C. Murphy heard one at different times in May, 1911, on Neutaconkanut Hill in Johnston.

Nannus hiemalis hiemalis. WINTER WREN.—On May 24, 1908, in company with Messrs. A. C. Bent of Taunton, Mass., and John Flanagan of Providence, I visited a swamp in Washington County to search for nests

of the Water Thrush, *Seiurus noveboracensis noveboracensis*. I soon found one in the upturned roots of a fallen tree with five eggs, and while waiting for my companions who were some distance from me, to come and see the nest, I inspected another upturned root a short distance from the first, and had the good luck to find a nest of the Louisiana Water-Thrush, *Seiurus motacilla*. This nest was in the lower right hand edge of the root about a foot above the water, and contained four eggs and two young just out of the shell. My companions having arrived at the spot, Mr. Flanagan called our attention to a Winter Wren that alighted on the root. We walked away a short distance and in a few moments she came in sight again with a caterpillar in her bill and disappeared among the roots. Going to the tree we soon found the wren's nest in the same roots with the nest of the Louisiana Water-Thrush, about four feet from it in the upper left hand edge. It was built in a cavity of the roots with weed stalks for a foundation, composed externally of green sphagnum moss, lined with soft grasses and a few white hairs of the Red Deer; globular in shape, with a small hole in the side for an entrance, it contained six young a week old. We heard the male singing its joyous, rippling song several times while we were in the vicinity of the nest. This is the first and only instance of its nesting in this state.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—Recorded in "Birds of Rhode Island" as a rare summer resident nesting at Newport. I have searched in several favorable localities for it, but have never heard or seen one. In the collection of the late Snowden Howland of Newport, now deposited in the American Museum of Natural History in New York City, is a set of five eggs taken in the "cattails" of Eastons Pond, Newport, on June 7, 1879.

Hylocichla guttata pallasii. HERMIT THRUSH.—Formerly known as a common migrant the Hermit Thrush has in recent years become a regular summer resident, locally dispersed, and breeding. The first nest was found by Mr. Walter A. Angell in Kent County on June 14, 1905, and contained five eggs incubated one week. Four more nests were found by him in the same locality one of which he kindly gave me the location of, and which I visited on July 10, 1907. I found the female on the nest and readily identified her. The nest was on the ground at the foot of a small laurel and contained three fresh eggs. On June 8, 1907, I heard two males singing in pitch pine woods in Coventry. Three males were singing on May 25, 1909, in South Kingstown and I have heard two or three every year in May and June in the same locality. June 12, 1909, I found a nest in Coventry with three nearly fresh eggs. It was on the ground between two small pine saplings not over a foot high, composed of dead leaves, weed stems, shreds of bark, and pine needles, and lined entirely with pine needles. A very bulky nest with thick walls and well rounded edge. Ten individuals were noted at various localities in 1909, their favorite haunts being the dry pitch pine and scrub oak regions.





CORY'S LEAST BITTERN (*Ixobrychus neoxenus*).

CORY'S LEAST BITTERN AT ITHACA, N. Y.

BY ARTHUR A. ALLEN.

Plate XXI.

ON the afternoon of May 17, while trudging through the marsh that lies at the head of Cayuga Lake, I flushed a strange bird from the cat-tails about fifteen feet before me. Its size and manner of flight were those of the Least Bittern, but it had none of the buffy markings so characteristic of that species. Instead its neck and breast appeared rich chestnut, and the wings uniformly dark. After the usual manner of the Least Bittern, it flew about one hundred yards and dropped again into the flags. Proceeding toward the spot, I called to Mr. Francis Harper, who was tramping through an adjoining part of the marsh, and we advanced together searching the waist-deep cat-tails for the bird. For a time we looked in vain, but finally it flushed about twenty feet from where we were standing. Despairing of finding it again in the flags while alive, I took a parting shot at it with a collecting pistol and succeeded in bringing it down. Upon picking it up, we found that it was a Cory's Least Bittern (*Ixobrychus exilis*). No vital spot had been touched by the shot, so we resolved to keep it alive as long as possible, or at least until Mr. Fuertes could find time to make sketches of the living bird, an opportunity not frequently occurring with this species. Returning to the Field Station, we placed the Bittern in an empty pail and left it alone for several minutes. When we returned, it fluttered excitedly and gave a hoarse cry very similar to that of the Least Bittern which Chapman has described as "a low frightened *qua*." It struck me, at the time, as somewhat harsher than that of the Least Bittern, but not having heard the latter recently, I might have been mistaken. This was the only sound emitted during its three days of captivity.

The bird proved a most interesting though untamable pet. One exercised care in approaching the box in which it was kept, for the long neck and spear-like bill were darted out with alarming rapidity, and with force sufficient to draw blood. Its usual atti-

tude was with the neck drawn back and the bill inclined slightly upward in characteristic heron pose. Occasionally, when slightly alarmed, it gradually extended its neck until it was stretched upward to its full length, the bill and even the body then assuming an almost vertical position. This was sometimes accomplished by movements so slow that it was difficult to perceive them with the eye. The resulting figure of the bird, as it faced the direction from which the disturbance arose, was nearly as slender as a rush and nearly as inconspicuous. When fully extended, the bittern sometimes slowly rotated until it had surveyed all sides with its piercing yellow eyes. With its bill pointed directly upward and its brilliant eyes directed forward past the angle of the mouth, it presented a very odd appearance. If the disturber next approached, the long neck subsided, the body settled, the feathers ruffled, the wings drooped, and the primaries spread until the bird seemed several times its original size. The bill was always held more or less vertical, except when directed in vicious jabs toward the observer. If one now continued to approach, the bittern swayed from side to side as though with excitement, its feathers fairly bristling and its diabolical eyes shining. If left alone for a time, it gradually assumed a more natural pose. A sudden sound had quite the reverse effect from that of the slight disturbance. Instead of extending its neck, it quickly crouched and drew its feathers very close to the body until it looked but one-half its natural size. The accompanying photographs show these poses well, if one allows for an unnatural drooping of the wing resulting from a break at the elbow joint.

The bittern was kept in a box about eight inches deep, containing a layer of sawdust and a shallow dish of water. In this dish were placed some small fish and tadpoles. Aside from the disappearance of one of the minnows while we were out of the room, there were no apparent signs of interest shown by the Bittern in the proffered food. Nor would it at first swallow any of the fish placed in its bill, unless they were directed well down into its throat when they disappeared automatically. On the second day, however, it lost some of its timidity, and twice it swallowed small fish placed crosswise in its bill. The function of the minute serrations on the mandibles was well demonstrated at these times, for the bird showed no difficulty in holding the slippery fish no matter

how much it struggled. After each feeding the bird became very much excited, swaying from side to side and bristling up all of its feathers, especially those of the crown and nape.

In spite of its crippled condition, the bittern showed great activity when left alone, and several times escaped from its box, which was left uncovered because of the bird's assumed helpless condition. The first time it not only climbed out of the box, but also managed to get down to the floor from the table upon which it was standing. Just how this was accomplished, with both wings and one leg broken, was not discovered since it remained quiet as long as any one was near. After the third day of its captivity, when it seemed to be losing in strength and lustre of plumage, and after Mr. Fuertes had made such studies as he desired, it was sent away to be mounted.

Allowing for six specimens from Florida, sixteen from Toronto, two from Michigan, and one each from Massachusetts, Wisconsin, and Ohio, this is the twenty-eighth recorded specimen of Cory's Least Bittern. It is a female in good plumage, and shows none of the albinistic tendencies observed in so many of the previous specimens.

AN ANNOTATED LIST OF THE BIRDS OF SANBORN COUNTY, SOUTHEAST-CENTRAL SOUTH DAKOTA.

BY STEPHEN SARGENT VISHER.

ONLY two lists of the birds of portions of eastern South Dakota have so far been published. 'Birds of the Coteau des Prairies' (the lake region of the northeastern corner) by C. E. McChesney,¹ and 'The Birds of Extreme Southeastern Dakota' by G. S. Agersborg.²

¹ One hundred species based on one year's work were given in 'Forest and Stream' for 1871. A more complete list of 152 species is to be found in Bulletin 5, United States Geological and Geological Survey of the Territories, 1875.

² A list, revised by W. W. Cooke, of 225 species observed mainly in the vicinity of Vermilion, in 'The Auk,' 1885.

The following list deals with an area which lies some fifty miles west of midway between the above mentioned regions. It is based on observations of the writer during the past fifteen years.

Sanborn County is located in the southeastern corner of central South Dakota. The Dakota or James river bisects it from north to south. It is a glaciated region, and in the main, a level plain except for the channel of the river and the main creeks. The rest of the area is poorly or not at all drained. There are hundreds of lake beds which contain water at certain seasons or throughout the year in wet periods. The largest and most permanent of these are Calahan Lake, twelve miles northeast of Forestburg, Kelley's Lake, five miles east of Forestburg, Artesian Lake, near the town of Artesian, Letcher Lake, near the town of Letcher, and Visher's Lake, near Forestburg. Long Lake, some five miles southwest of Forestburg, formerly was a great expanse of water. It has now been drained. None of these contain as much as a square mile of water.

The trees of the area are found in native groves along the river and the lower portions of the creeks and in small artificial groves scattered over the upland. The common species are the ash, elm, hackberry, boxelder, willow and cottonwood. Plum and choke-cherry thickets are frequent.

A large portion of the upland is at present cultivated, but there are considerable tracts along the streams and in the sandy region southwest of Forestburg which are still open. Forestburg is centrally located. Artesian is eleven miles east and Woonsocket is nine miles west on the C. M. & St. P. railroad. Letcher is ten miles southwest on another line of the same railroad. In size, the county is twenty-four miles square. The elevation of the area averages 1300 feet above sea level.

The most abundant birds of the treeless portions of the plains are the Western Meadowlark, Prairie Horned Lark, Upland Plover, Prairie Chicken, Marsh and Swainson's Hawks, Short-eared and Burrowing Owls, Sennett's Nighthawk, Bobolink, Cowbird, Chestnut-collared Longspur, Western Vesper Sparrow, Western Grasshopper Sparrow, Dickcissel, and Lark Bunting.

The birds most frequently found nesting in the upland are the Bob-white, Western Mourning Dove, Sparrow Hawk, Flicker,

Kingbird, Arkansas Kingbird, Traill's Flycatcher, Crow, Bronzed Grackle, Orchard Oriole, Goldfinch, Lark Sparrow, Chipping Sparrow, White-rumped Shrike, Yellow Warbler, Catbird and Brown Thrasher.

In addition the following are common in the groves along the river: Black-crowned Night Heron, Western Red-tailed Hawk, Screech Owl, Cuckoos, Hairy and Downy Woodpecker, Blue Jay, Rose-breasted Goshawk, Song Sparrow, Towhee, Western Yellowthroat and Western House Wren.

Species which nest plentifully about the ponds and the small lakes are the Eared Grebe, Franklin's Gull, Black Tern, Baldpate, Blue-winged Teal, Shoveller, Pintail, Bittern, Virginia Rail, Sora, Coot, Wilson's Phalarope, Killdeer, Yellow-headed Blackbird, and Thick-billed Red-wing. Kingfishers are numerous along the river. Several additional species nest on large lakes in adjacent counties.

A number of specimens of birds observed in Sanborn County and collected either there, or near Nemo in Hutchinson County, (also in the Dakota Valley, but lying a short distance south of Sanborn), or in other localities as far or further from the center of distribution of the species, have been submitted to the Biological Survey for verification. The identifications were chiefly made by H. C. Oberholser. It has been thought desirable to append in brackets the known data concerning some of these museum specimens.

1. ***Æchomorphus occidentalis***. WESTERN GREBE.—A frequent migrant. [Hamlin County, Nov. 10, H. E. Lee who reports their nesting there.]

2. ***Colymbus holbœlli***. HOLBÆLL'S GREBE.—A common migrant.

3. ***Colymbus auritus***. HORNED GREBE.—Common during migrations.

4. ***Colymbus nigricollis californicus***. EARED GREBE.—A common summer resident of the larger bodies of water.

5. ***Podilymbus podiceps***. PIED-BILLED GREBE.—Breeds less abundantly than the Eared Grebe.

6. ***Gavia immer***. LOON.—A tolerably common migrant.

7. ***Larus argentatus***. HERRING GULL.—A small number of these gulls are seen each spring and fall.

8. ***Larus delawarensis***. RING-BILLED GULL.—A common migrant.

9. ***Larus franklini***. FRANKLIN'S GULL.—Large flocks are frequently seen during the summer. They seem to stray considerable distances away

from their nesting sites.—For example, we saw them one summer many times near Forestburg, though I believe none of them then nested within twenty miles.

10. *Sterna forsteri*. FORSTER'S TERN.—Occasionally common during migrations.

11. *Sterna hirundo*. COMMON TERN.—Frequent in migrations.

12. *Hydrochelidon nigra surinamensis*. BLACK TERN.—Breeds abundantly on all marshes and lakes, arrives April 20, departs in October.

13. *Phalacrocorax auritus auritus*. DOUBLE-CRESTED CORMORANT.—A tolerably common migrant during April and October.

14. *Pelecanus erythrorhynchos*. WHITE PELICAN.—An abundant migrant, passing in large flocks during April and late September and October.

15. *Mergus americanus*. MERGANSER.—A rather rare migrant.

16. *Mergus serrator*. RED-BREASTED MERGANSER.—A common migrant.

17. *Lophodytes cucullatus*. HOODED MERGANSER.—A common migrant, especially numerous along the Dakota river.

18. *Anas platyrhynchos*. MALLARD.—A very abundant migrant, and quite common as a breeder. Nests found. Mallards are occasionally seen late in February, but are not very abundant until late in March.

19. *Anas rubripes*. BLACK DUCK.—A rare migrant.

20. *Chaulelasmus streperus*. GADWALL.—A tolerably common migrant and probably a rare breeder.

21. *Mareca americana*. BALDPATE.—Abundant during migrations and tolerably common in summer.

22. *Nettion carolinense*. GREEN-WINGED TEAL.—Abundant migrant and occasionally a rare breeder. Arrives early in April and early in September. Departs early in May and in November.

23. *Querquedula discors*. BLUE-WINGED TEAL.—An abundant migrant and summer resident. By far the most abundant duck during the summer. Breeds on all ponds and bayous of rivers. Arrives late in April and leaves in November.

24. *Querquedula cyanoptera*. CINNAMON TEAL.—Tolerably common in the spring of 1901. Ordinarily a rare bird.

25. *Spatula clypeata*. SHOVELLER.—An abundant summer resident. Arrives about April first but not conspicuously abundant until the middle of the month.

26. *Dafila acuta*. PINTAIL.—The Pintail or "spike-tail" is the earliest duck. Until late in March it is the predominant species. It is a common breeder also.

27. *Aix sponsa*. WOOD DUCK.—Only a few pairs breed along the Dakota river in this county.

28. *Marila americana*. REDHEAD.—An abundant migrant and a fairly common breeder. Arrives late in March and leaves late in October or November.

29. *Marila valisineria*. CANVAS-BACK.— A common migrant and tolerably common breeder. Associated with the Redheads.

30. *Marila marila*. SCAUP DUCK.— A common migrant.

31. *Marila affinis*. LESSER SCAUP DUCK.— An abundant migrant.

32. *Marila collaris*. RING-NECKED DUCK.— A common migrant.

33. *Clangula clangula americana*. GOLDEN-EYE.— A rare migrant.

34. *Charitonetta albeola*. BUFFLE-HEAD.— A common migrant.

35. *Erisimatura jamaicensis*. RUDDY DUCK.— A very common summer resident. Because of their diving ability these ducks are safe and have nests even within the corporation limits of Artesian and Letcher, upon the lakes.

36. *Chen hyperboreus hyperboreus*. SNOW GOOSE.— A very common migrant.

37. *Anser albifrons gambeli*. WHITE-FRONTED GOOSE.— An abundant migrant. Sometimes seen as late as early June.

38. *Branta canadensis canadensis*. CANADA GOOSE.— A common migrant. The first goose to appear in the spring.

39. *Branta canadensis hutchinsi*. HUTCHINS'S GOOSE.— A very common migrant. Rarely seen in the same flock with the larger subspecies.

40. *Olor columbianus*. WHISTLING SWAN.— A common migrant. During the spring of 1905 two of these birds remained on Calahan Lake from mid-April to mid-May.

41. *Botaurus lentiginosus*. BITTERN.— An abundant breeder. Arrives late in April and leaves late in September.

42. *Ixobrychus exilis*. LEAST BITTERN.— Occasional; a rare breeder.

43. *Ardea herodias herodias*. GREAT BLUE HERON.— A common migrant and a rare breeder.

44. *Butorides virescens virescens*. GREEN HERON.— Nests commonly along the river.

45. *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON.— Until 1903 a colony of about two hundred nests was maintained in an ash grove about two miles south of Forestburg. The creation of a 'park' resulted in the desertion of this site and the establishment of a heronry in a scrub oak grove about five miles down stream. The herons from this colony daily spread over a large area. They went at least 15 miles up stream and more than 12 miles east, and as far west.

46. *Grus americana*. WHOOPING CRANE.— A rare migrant.

47. *Grus mexicana*. SANDHILL CRANE.— Abundant in migrations and a tolerably common breeder. Nests found. The call of the crane is one of the most memorable of bird calls.

48. *Rallus virginianus*. VIRGINIA RAIL.— Abundant migrant and common breeder.

49. *Porzana carolina*. SORA.— An abundant breeder.

50. *Fulica americana*. COOT.— An exceedingly abundant breeder. In the fall thousands spend several weeks on Visser's Lake.

51. *Lobipes lobatus*. NORTHERN PHALAROPE.— Rare migrant, specimens taken.

52. *Steganopus tricolor*. WILSON'S PHALAROPE.— An abundant migrant and breeder.
53. *Recurvirostra americana*. AVOCET.— A rare migrant.
54. *Gallinago delicata*. WILSON'S SNIPE.— An abundant migrant.
55. *Macrorhamphus griseus scolopaceus*. LONG-BILLED DOWITCHER.— A common migrant.
56. *Micropalama himantopus*. STILT SANDPIPER.— A tolerably common migrant. [Vermilion, May 10.]
57. *Pisobia maculata*. PECTORAL SANDPIPER.— An abundant migrant.
58. *Pisobia fuscicollis*. WHITE-RUMPED SANDPIPER.— A common migrant.
59. *Pelidna alpina sakhalina*. RED-BACKED SANDPIPER.— A tolerably common migrant.
60. *Pisobia bairdi*. BAIRD'S SANDPIPER.— A tolerably common migrant.
61. *Pisobia minutilla*. LEAST SANDPIPER.— A common migrant.
62. *Ereunetes pusillus*. SEMIPALMATED SANDPIPER.— A fairly common migrant.
63. *Limosa fedoa*. MARBLED GODWIT.— Very rare.
64. *Limosa hæmastica*. HUDSONIAN GODWIT.— I have seen only one individual, near Artesian, July 10, 1903.
65. *Totanus melanoleucus*. GREATER YELLOW-LEGS.— A very common migrant.
66. *Totanus flavipes*. YELLOW-LEGS.— An abundant migrant.
67. *Helodromas solitarius solitarius*. SOLITARY SANDPIPER.— In matter of numbers only a common migrant; but during May, July and August, one or two may be seen on almost every body of water. [Nemo, Sept. 1.]
68. *Catoptrophorus semipalmatus inornatus*. WESTERN WILLET.— A common migrant.
69. *Bartramia longicauda*. UPLAND PLOVER.— Nests abundantly throughout the county. I do not believe it is notably less common than ten years ago.
70. *Actitis macularia*. SPOTTED SANDPIPER.— An abundant migrant. This sandpiper is the one seen frequently along the river. It nests tolerably commonly. I have caught downy young.
71. *Squatarola squatarola*. BLACK-BELLIED PLOVER.— Occasionally a common migrant.
72. *Charadrius dominicus dominicus*. GOLDEN PLOVER.— Occasionally a common migrant.
73. *Oxyechus vociferus*. KILLDEER.— A very abundant summer resident. Arrives before the middle of March and departs in November.
74. *Ægialitis semipalmata*. SEMIPALMATED PLOVER.— Common migrant.
75. *Ægialitis meloda*. PIPING PLOVER.— A tolerably common migrant.

76. *Arenaria interpres morinella*. RUDDY TURNSTONE.— I saw a flock of eight of these birds May 30, 1905.

77. *Colinus virginianus virginianus*. BOB-WHITE.— A fairly abundant resident. An occasional particularly severe winter decimates their number.

78. *Tympanuchus americanus americanus*. PRAIRIE CHICKEN.— An abundant resident.

79. *Pediocetes phasianellus campestris*. PRAIRIE SHARP-TAILED GROUSE.— This grouse replaces the Prairie Chicken, in the wide, sandy stretch southwest of Forestburg. The grayish epaulettes of the young are conspicuous as they alight. Quite abundant everywhere in winter.

80. *Zenaidura macroura marginella*. WESTERN MOURNING DOVE.— An abundant summer resident. I have found nests on the ground several times. [Nemo, Aug. 14.]

81. *Cathartes aura septentrionalis*. TURKEY VULTURE.— Seen occasionally during the summer, and more frequently in September.

82. *Circus hudsonius*. MARSH HAWK.— Abundant from early March to the coming of winter.

83. *Accipiter velox*. SHARP-SHINNED HAWK.— A tolerably common migrant.

84. *Accipiter cooperi*. COOPER'S HAWK.— Rare, during migrations.

85. *Astur atricapillus atricapillus*. GOSHAWK.— Rare migrant.

86. *Buteo borealis calurus*. WESTERN RED-TAIL.— A common breeder.

87. *Buteo borealis krideri*. KRIDER'S HAWK.— A common migrant.

88. *Buteo lineatus lineatus*. RED-SHOULDERED HAWK.— A rare migrant.

89. *Buteo swainsoni*. SWAINSON'S HAWK.— Breeds abundantly. Arrives early in April and departs in October.

90. *Buteo platypterus*. BROAD-WINGED HAWK.— Seen twice during the summer. Collected near Pierre by H. E. Lee.

91. *Archibuteo lagopus sancti-johannis*.— ROUGH-LEGGED HAWK.— Common migrant and tolerably common in winter near the woods.

92. *Archibuteo ferrugineus*. FERRUGINEOUS ROUGH-LEG.— Abundant migrant and common in winter. More a bird of the open than the preceding.

93. *Aquila chrysaetos*. GOLDEN EAGLE.— Common during the winter.

94. *Halietus leucocephalus leucocephalus*. BALD EAGLE.— Rare winter visitant.

95. *Falco mexicanus*. PRAIRIE FALCON.— Common except in mid-summer.

96. *Falco peregrinus anatum*. DUCK HAWK.— Occasional migrant.

97. *Falco columbarius columbarius*. PIGEON HAWK.— A tolerably common migrant.

98. *Falco sparverius sparverius*. SPARROW HAWK.— Breeds abundantly.

99. **Pandion haliaëtus carolinensis.** OSPREY.— One was clearly seen flying down the river October 15, 1905.

100. **Asio wilsonianus.** LONG-EARED OWL.— Abundant migrant and an occasional resident.

101. **Asio flammeus.** SHORT-EARED OWL.— Abundant except in the winter, when it is rare. Nests found.

102. **Otus asio asio.** SCREECH OWL.— An abundant resident. Nests found.

103. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— Very common in winter.

104. **Nyctea nyctea.** SNOWY OWL.— Irregularly common in winter, especially in February.

105. **Speotyto cunicularia hypogæa.** BURROWING OWL.— An abundant summer resident. There are but few prairie dog towns in this county. Most of these owls here nest in deserted badger holes.

106. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.— Nests commonly, arriving about May 15 and leaving Sept. 1.

107. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.— Somewhat less common than the Yellow-billed.

108. **Ceryle alcyon alcyon.** BELTED KINGFISHER.— Breeds commonly along the river. Absent only during the period of ice.

109. **Dryobates villosus villosus.** HAIRY WOODPECKER.— Common in winter, and occasionally seen in summer in woods along the river. [Menno, Aug. 21.]

110. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— A common resident in the Dakota Valley. [Pierre, Dec. 10. H. E. Lee. Mouth of Cheyenne River, Aug. 26.]

111. **Sphyrapicus varius varius.** YELLOW-BELLIED SAPSUCKER.— A tolerably common migrant, during the latter half of April.

112. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— A common migrant and tolerably common breeder.

113. **Colaptes auratus luteus.** NORTHERN FLICKER.— An abundant resident late in March to October. Decidedly the most common woodpecker outside of the river valley.

114. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— Rare visitor. I collected one of a pair April 5, 1912.

115. **Chordeiles virginianus sennetti.** SENNETT'S NIGHTHAWK.— An abundant summer resident.

116. **Chætura pelagica.** CHIMNEY SWIFT.— Rare. Occasionally breeds.

117. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.— Breeds where there is honeysuckle. Not seen elsewhere.

118. **Tyrannus tyrannus.** KINGBIRD.— An abundant summer resident from May 8 to September.

119. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— Abundant in summer especially about the small groves and 'tree claims' of the prairies.

120. **Sayornis phoebe.** PHOEBE.—Tolerably common migrant and rare breeder.
121. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.—Rare migrant.
122. **Myiochanes virens.** WOOD PEWEE.—Tolerably common breeder.
123. **Empidonax traillii alnorum.** ALDER FLYCATCHER.—Breeds abundantly in the willow thickets along the streams. [Forestburg, Aug. 10, Everts, Aug. 6.]
124. **Empidonax minimus.** LEAST FLYCATCHER.—Tolerably common summer resident. (Everts, Aug. 7.)
125. **Otocoris alpestris praticola.** PRAIRIE HORNED LARK.—An abundant resident.
126. **Otocoris alpestris leucolæma.** DESERT HORNED LARK.—Abundant in hard winters. (Mr. Oberholser identified one specimen, collected in February in Hutchinson county, as *O. a. entymia*.)
127. **Pica pica hudsonia.** MAGPIE.—Common along the river in winter.
128. **Cyanocitta cristata cristata.** BLUE JAY.—Abundant except in winter. Occasionally winters.
129. **Corvus corax sinuatus.** RAVEN.—Tolerably common during the fall of 1906.
130. **Corvus brachyrhynchos brachyrhynchos.** CROW.—Abundant resident.
131. **Dolichonyx oryzivorus.** BOBOLINK.—An abundant summer resident, May 5 to Sept. 1, though rare after Aug. 1.
132. **Molothrus ater ater.** COWBIRD.—Abundant from April to September.
133. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.—Numerous in the marshes which have cat-tails and reeds.
134. **Agelaius phœniceus fortis.** THICK-BILLED RED-WING.—Breeds abundantly in marshes and in willows at water's edge. Arrives about the middle of March and leaves late in November. (Mr. Oberholser labeled my midsummer specimens as *A. p. arctolegus*. Forestburg, Aug. 10.)
135. **Sturnella neglecta.** WESTERN MEADOWLARK.—One of the most abundant of prairie birds from mid-April to November. Occasionally an individual winters.
136. **Icterus spurius.** ORCHARD ORIOLE.—Abundant in the summer, especially in the willow groves along the river. May 1 to July 31.
137. **Icterus galbula.** BALTIMORE ORIOLE.—A common summer resident especially in the town of Woonsocket.
138. **Icterus bullocki.** BULLOCK'S ORIOLE.—An occasional fall migrant. [Menno, Aug. 24.]
139. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.—A common migrant March and April, October and November. [Vermilion, April.]

140. *Quiscalus quiscula æneus*. BRONZED GRACKLE.— Abundant from March 15 to October.
141. *Herperiphona vespertina vespertina*. EVENING GROSBEAK.— Rare winter visitant.
142. *Loxia curvirostra minor*. CROSSBILL.— Rare migrant.
143. *Acanthis linaria linaria*. REDPOLL.— Common during the winter months about the groves.
144. *Astragalinus tristis tristis*. GOLDFINCH.— Abundant during the summer, May 1, — October. Occasionally winters.
145. *Spinus pinus*. PINE SISKIN.— Tolerably common migrant, and occasionally common in winter.
146. *Plectrophenax nivalis nivalis*. SNOW BUNTING.— Abundant some winters, but rare others.
147. *Calcarius lapponicus lapponicus*. LAPLAND LONGSPUR.— Abundant from September to April.
148. *Calcarius ornatus*. CHESTNUT-COLLARED LONGSPUR.— Abundant from late March to October. Nests found.
149. *Rhynchophanes mccowni*. MCCOWN'S LONGSPUR.— A tolerably common migrant and seemingly a rare breeder.
150. *Poœcetes gramineus confinis*. WESTERN VESPER SPARROW.— An abundant breeder, April to September. [Forestburg, July 15.]
151. *Passerculus sandwichensis savanna*. SAVANNAH SPARROW.— A tolerably common breeder. Abundant in migrations, late in April and mid-September. [Vermilion, May.]
152. *Passerculus sandwichensis alaudinus*. WESTERN SAVANNAH SPARROW.— A rare migrant. [Menno, April.]
153. *Ammodramus savannarum bimaculatus*. WESTERN GRASSHOPPER SPARROW.— Abundant from late April till early September. [Menno, Aug. 15.]
154. *Passerherbulus henslowi occidentalis*. WESTERN HENSLOW'S SPARROW.— A tolerably frequent migrant.
155. *Passerherbulus lecontei*. LECONTE'S SPARROW.— Tolerably common migrant; a rare breeder.
156. *Chondestes grammacus grammacus*. LARK SPARROW.— Nests rather commonly in dying tree claims.
157. *Zonotrichia querula*. HARRIS'S SPARROW.— An abundant migrant.
158. *Zonotrichia leucophrys leucophrys*. WHITE-CROWNED SPARROW.— A common migrant.
154. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.— A very common migrant.
160. *Spizella monticola ochracea*. WESTERN TREE SPARROW.— The most abundant sparrow of the thickets from November to April. [Menno, Dec. 27.]
161. *Spizella passerina passerina*. CHIPPING SPARROW.— Nests not infrequently.

162. **Spizella pallida.** CLAY-COLORED SPARROW.—Plentiful in migrations. Frequently nests.
163. **Spizella pusilla arenacea.** WESTERN FIELD SPARROW.—Nests commonly in the roughest areas. [Vermilion, June.]
164. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.—Plentiful in migrations. Occasionally present almost, if not quite, all winter.
165. **Melospiza melodia melodia.** SONG SPARROW.—Abundant migrant. Plentiful in summer along the wooded streams.
166. **Melospiza lincolni lincolni.** LINCOLN'S SPARROW.—Regular migrant.
167. **Melospiza georgiana.** SWAMP SPARROW.—Rare in the summer, frequent in migrations.
168. **Passerella iliaca iliaca.** FOX SPARROW.—Irregular migrant.
169. **Pipilo erythrophthalmus erythrophthalmus.** TOWHEE.—Nests commonly.
170. **Pipilo maculatus arcticus.** ARCTIC TOWHEE.—Plentiful in migrations.
171. **Zamelodia ludoviciana.** ROSE-BREASTED GROSBEAK.—Abundant in groves from early May to early September. [Menno, June 10.]
172. **Passerina cyanea.** INDIGO BUNTING.—An uncommon summer visitor.
173. **Passerina amoena.** LAZULI BUNTING.—An occasional or accidental visitor. One certainly seen along the river in May, 1905.
174. **Spiza americana.** DICKCISSEL.—Very abundant during June and July.
175. **Calamospiza melanocorys.** LARK BUNTING.—This species was a plentiful summer resident of this county during the dry years of the nineties. Since 1900 they have bred but infrequently here.
176. **Piranga erythromelas.** SCARLET Tanager.—A rare May and June visitor.
177. **Progne subis subis.** PURPLE MARTIN.—Plentiful in summer, about the towns.
178. **Petrochelidon lunifrons lunifrons.** CLIFF SWALLOW.—Nests in colonies under the eaves of barns. Locally abundant.
179. **Hirundo erythrogastra.** BARN SWALLOW.—This is the best known swallow as it nests in all barns.
180. **Iridoprocne bicolor.** TREE SWALLOW.—An abundant migrant and a rare breeder.
181. **Riparia riparia.** BANK SWALLOW.—Breeds in large colonies along the river.
183. **Stelgidopteryx serripennis.** ROUGH-WINGED SWALLOW.—Breeds in small colonies in cut banks along roads and streams, quite frequent.
183. **Bombycilla garrula.** BOHEMIAN WAXWING.—Irregular during autumn, winter and spring.
184. **Bombycilla cedorum.** CEDAR WAXWING.—Uncommon migrant; occasionally seen all summer.

185. *Lanius borealis*. NORTHERN SHRIKE.—Common in winter.
186. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.—Breeds in most tree claims. [Forestburg, Aug. 15.]
187. *Vireosylva olivacea*. RED-EYED VIREO.—A common migrant. [Cheyenne Agency, Aug. 12.]
188. *Vireosylva gilva gilva*. WARBLING VIREO.—To be found in many groves in summer.
189. *Mniotilta varia*. BLACK AND WHITE WARBLER.—A very common migrant.
190. *Vermivora celata celata*. ORANGE-CROWNED WARBLER.—A rare migrant. [Menno, April].
191. *Vermivora peregrina*. TENNESSEE WARBLER.—A rare migrant. [Menno, May?]
192. *Dendroica æstiva æstiva*. YELLOW WARBLER.—Found abundantly everywhere about groves.
193. *Dendroica cærulescens cærulescens*. BLACK-THROATED BLUE WARBLER.—A fairly common migrant.
194. *Dendroica coronata*. MYRTLE WARBLER.—An abundant migrant.
195. *Dendroica magnolia*. MAGNOLIA WARBLER.—A common migrant.
196. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—An uncommon migrant.
197. *Dendroica castanea*. BAY-BREADED WARBLER.—A rare migrant. [Menno, May?]
198. *Dendroica striata*. BLACK-POLL WARBLER.—An abundant migrant. [Menno, May?]
199. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—An uncommon migrant.
200. *Dendroica palmarum palmarum*. PALM WARBLER.—A common migrant.
201. *Seiurus aurocapillus*. OVEN-BIRD.—A regular migrant.
202. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER-THRUSH.—Common in spring and fall along the streams. Seen once in July. [Menno, May.]
203. *Oporornis philadelphia*. MOURNING WARBLER.—A rare migrant.
204. *Geothlypis trichas occidentalis*. WESTERN YELLOW-THROAT.—The 'witchitee-bird' nests in thickets about water quite generally, in this area. Mr. Oberholser labelled two specimens as *G. t. brachidactyla*. [Menno, June 10, Aug. 30.]
205. *Icteria virens virens*. YELLOW-BREADED CHAT.—An uncommon visitor. Breeds rarely.
206. *Wilsonia pusilla pusilla*. WILSON'S WARBLER.—A common migrant.
207. *Setophaga ruticilla*. REDSTART.—Abundant migrant and rare breeder.

208. **Anthus rubescens.** PIPIT.— A common migrant.
209. **Anthus spraguei.** SPRAGUE'S PIPIT.— This bird is always seen and heard in migrations, especially common during the autumn.
210. **Dumetella carolinensis.** CATBIRD.— An abundant breeder in all thickets.
211. **Toxostoma rufum.** BROWN THRASHER.— Plentiful in summer.
212. **Troglodytes ædon parkmani.** WESTERN HOUSE WREN.— Breeds abundantly along the rivers and about the towns. [Menno, Aug. 24.]
213. **Nannus hiemalis hiemalis.** WINTER WREN.— A rare migrant. [Menno, April 14.]
214. **Cistothorus stellaris.** SHORT-BILLED MARSH WREN.— Several nests found; quite common.
215. **Telmatoodytes palustris iliacus.** PRAIRIE MARSH WREN.— Rare migrant and occasional breeder.
216. **Certhia familiaris americana.** BROWN CREEPER.— A common migrant. Rare in winter.
217. **Sitta carolinensis carolinensis.** WHITE-BREADED NUTHATCH.— A tolerably common migrant. [Menno, February 15.]
218. **Sitta canadensis.** RED-BREADED NUTHATCH.— A rare migrant.
219. **Penthestes atricapillus septentrionalis.** LONG-TAILED CHICKADEE.— Common except in mid-summer. Nests rarely. [Menno, September 2.]
220. **Regulus satrapa satrapa.** GOLDEN-CROWNED KINGLET.— A tolerably common migrant.
221. **Regulus calendula calendula.** RUBY-CROWNED KINGLET.— A common migrant.
222. **Hylocichla mustelina.** WOOD THRUSH.— A fairly common migrant. Breeds occasionally.
223. **Hylocichla fuscescens salicicola.** WILLOW THRUSH.— Common in migrations.
224. **Hylocichla aliciaë aliciaë.** GRAY-CHEEKED THRUSH.— A common migrant.
225. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.— A common migrant.
226. **Hylocichla guttata pallasi.** HERMIT THRUSH.— A rare or accidental migrant.
227. **Planesticus migratorius migratorius.** ROBIN.— Breeds abundantly in the towns. Rare elsewhere.
228. **Sialia sialis sialis.** BLUEBIRD.— Nests irregularly. Sometimes common in migrations.

BIRDS NEW OR RARE TO THE FAUNA OF MAINE.

BY ARTHUR H. NORTON.

THE following records which have come under my observation during the past few years represent additions to the avifauna of Maine or additional occurrences of species rarely found in the state.

Xema sabini. SABINE'S GULL.—On September 11, 1912, Mr. Everett Smith and I saw one of these birds near Bluff Island, Saco Bay, Me. It came in from the eastward with a few terns attracted by fish livers which we were throwing out, but it did not come quite within gunshot. Its slaty mantle, small size, and black edged wing were carefully noted. Its flight resembled that of the terns, but its manner of feeding that of Bonaparte's Gull. Mr. Smith secured a specimen near this spot May 31, 1877.¹

The only other Maine record seems to be one near the Brothers Islands, Casco Bay, September 22, 1899.²

Sterna dougalli. ROSEATE TERN.—Since there are but few records of this tern for Maine and none of these are recent, it seems suitable to publish this occurrence. While Mr. Everett Smith and I were near Bluff Island, Saco Bay, August 19, 1912, Mr. Smith secured an adult specimen of this bird, which he presented to the collection of the Portland Society of Natural History. The other records are as follows:

A small flock was seen upon the Green Islands in Casco Bay on the 20th of July [prior to 1879].³

A few once bred on a small island near Tenants Harbor, St. George, and at the Isles of Shoals.⁴

The two following reports are in print. "A few seen, Fox Island, August 6 [and] 12 [18] 99, identification not absolute"⁵ and "Three seen on August 31, 1900 [near Isleboro] by G. C. Shattuck."⁶

Mareca penelope. EUROPEAN WIDGEON.—Mr. E. B. Pillsbury brought me a female of this bird, in the flesh which was taken at Scarborough November 13, 1912, the first of the kind to be detected in the state.

There is another specimen in the state museum at Augusta taken at Swan Island, Merrymeeting Bay, September 20, 1911. I am obliged to

¹ 1883, Smith, *Forest & Stream*, XX: 205.

² 1900, Knight, *Journ. Me. Orn. Soc.*, II: 2.

³ 1879, Brewster, *Bull. Nutt. Orn. Cl.* IV: 15.

⁴ 1884, Brewer, *Hist. N. Am. Bds., Water Bds.*, II: 305.

⁵ 1900, Howe, *Journ. Me. Orn. Soc.*, II: 28.

⁶ 1901, Howe, *Journ. Me. Orn. Soc.*, III: 14.

Mr. Thomas James, curator of the state museum, both for the privilege of making a careful examination of the specimen and for permission to record it. Additional specimens are to be expected.

Clangula islandica. BARROW'S GOLDEN-EYE.—Barrow's Golden-Eye is well known to occur regularly on the Maine coast westward to upper Penobscot Bay. West of this region there have been no records for the state. It is with considerable interest then that the following records of its occurrence at Scarborough, are presented.

Among the heads of a number of Ducks brought me for the preparation of skulls, were a young male and a female of this species. Mr. E. B. Pillsbury who secured the birds was certain that they were taken either December 30, or December 31, 1911, but the two were not in each others company. Mr. Pillsbury very kindly offered to aid me in looking for more and in the attempt to secure specimens, with the result that we secured two females Jan. 11, a superb adult male March 26, and an immature male March 28, 1912.

Chen hyperborea hyperborea. SNOW GOOSE.—Through an oversight, which has passed unchallenged, in recording a specimen of this bird taken in Gorham, Maine, in November, 1908,¹ the technical name of the next subspecies was used together with the common name of the present form, rendering the record void.

As the original records of Snow Geese in Maine are scattered, if not somewhat obscured, the following summary is presented:

C hyperborea hyperborea.—One near Portland, December, 1880.²

A male, Toddy Lake, Hancock Co., October, 4, 1893 and a male Lake Umbagog, October 2, 1896.³

One at Pushaw [Pond] and one at Nicatous. [Prior to 1897.]⁴

Two were taken near Merrymeeting Bay, one October 10, the other a short time later in 1897.⁵

Of this total of eight specimens which have been identified, all have been autumnal, occurring singly or in pairs.

The following fall records, and reports of Snow Geese not identified, are presented under this subspecies.

One at Glenburn, October 18, 1881, and one near Hallowell, November 25, 1881.⁶

The late Alpheus G. Rogers of Portland gave me information of one seen by him at Cape Elizabeth, October 9, 1911.

Chen hyperborea nivalis. GREATER SNOW GOOSE.—On April 4, 1913, a flock of upwards of thirty Snow Geese were seen at Pine Point. Scarborough by Mr. I. W. Pillsbury, and others. They alighted and

¹ 1909, Norton, Auk, XXVI: 304.

² 1882, Brown, Abstr. Proc. Portland Soc. N. H., II: 2.

³ 1897, Brewster, Auk, XIV: 207.

⁴ 1897, Knight, *vide* Hardy. Bull. 3, Univ. of Me., 36.

⁵ 1898, Knight, *vide* Day. Maine Sportsman, Sept. 1898, p. 14.

⁶ 1883, Smith, Forest & Str., XX: 125.

though frightened several times, remained in the vicinity a few hours and finally passed to the eastward. The following day several smaller flocks were reported in different parts of Casco Bay. From one of these flocks four birds were shot, at Great Chebague Island. After considerable effort I succeeded in securing one of the heads (all of the available remains) and it proved to be of this form.

The previous records are:

One, Heron Island, Phippsburg, April 7, 1890.¹

One, Back River, Georgetown, April 25, 1903.²

One, Lubec, April 30, 1906.³

Since all spring specimens so far identified (totaling four) have been of this form the following spring records and reports of Snow Geese are arranged here.

A flock of about two hundred on the ice of Long Pond between Bridgton and Harrison, April 13, 1908, and similar flock on Sebago Lake the following day.⁴

There is also a published report of "A flock" which "remained undisturbed half a day" on Nonesuch River, Scarborough"⁵ [prior to 1883], but without mention of season or date.

Macrorhamphus griseus scolopaceus. LONG-BILLED DOWITCHER.— Though long anticipated,⁶ and probably of casual occurrence, material for the first positive record of the Long-billed Dowitcher, comes to hand in a specimen in fresh winter plumage taken at Scarborough in the first half of October, 1912, by Mr. John Peterson. Mr. Peterson had the specimen mounted, and presented it to the museum of the Portland Society of Natural History.

Machetes pugnax. RUFF.— On October 16, 1912, a female of this species was shot on the Nonesuch River, Scarborough, by Mr. I. W. Pillsbury from whom it came into my possession. This is but a short distance from the spot where Mr. Everett Smith, shot the first Maine specimen in 1870.⁷ In both instances the birds were alone, the last one came in from the sea, and alighted. This supplies material for the fourth record for the state, the others being:

The Smith specimen referred to April 10, 1870.⁸

A female taken at Upton, Me., September 8, 1874,⁹ (the second specimen, but first to be published.)

A specimen is recorded as taken at Camden, Maine, September 14, 1900.¹⁰

¹ 1890, Batchelder, Auk VII: 284.

² 1904, Spinney, Journ. Me. Orn. Soc., VI: 69.

³ 1906, Clark, Journ. Me. Orn. Soc., VIII: 48.

⁴ 1908, Mead, Journ. Me. Orn. Soc., X: 59.

⁵ 1883, Smith, Forest & Str., XX: 125.

⁶ 1882, Brown, Proc. Port. Soc. N. H., II: 26.

⁷ 1883, Smith, Forest & Str., XX: 85.

⁸ l. c.

⁹ 1876, Brewster, Bull. Nutt. Orn. Cl., I: 19.

¹⁰ 1905, Thayer, Auk, XXII: 409.

GENERAL NOTES.

The Red-throated Loon (*Gavia stellata*) at the Southern Extremity of Lake Michigan.— March 24, 1913 I found an immature female of this species lying dead on the beach at Miller, Lake Co., Indiana. Evidently some hunter had shot it and then thrown it away. It was in excellent condition, being very fat, and had been, to all appearances, recently killed. It may be, as Mr. B. F. Gault suggests, that this species is more common on Lake Michigan during the colder months than is generally supposed, but printed records, for the region about Chicago at least, are few. Therefore, it seems worth while to put this specimen on record. I have preserved the skin.

Mr. Gault has very kindly given me permission to publish another record concerning the appearance of this species in the Chicago area. April 18, 1908, he found a specimen in adult plumage in the shop of a taxidermist at Lyons. This bird was said to have been shot that morning nearby in the Desplaines River below Riverside, a western suburb of Chicago.

I wish to express my obligations to Messrs. A. W. Butler and B. T. Gault for information concerning previous records.— EDWIN D. HULL, *Chicago, Ill.*

The Old-squaw (*Harelda hyemalis*) on the Connecticut Coast in Summer.— Since there seem to be but few published notes concerning the occurrence of the Old-squaw south of its breeding grounds in summer, the following notes will probably be of interest. I first observed this species in summer on August 2, 1906, in a small bay at the mouth of Oyster River, West Haven, Conn. There were three of the birds at this time. They were observed very closely and seemed disinclined, and perhaps unable to fly. When I threw stones close to them they paid no attention, and when I ran at them suddenly, to try to make them fly, they merely dove.

My second meeting with this species in summer occurred recently at Compo, Conn., near Westport. On the evening of July 14, 1913, I was out rowing with three friends. It was a warm, moonlight, summer evening without a breath of wind. When nearly a mile from shore we heard the calling of a flock of Old-squaws. As we drew nearer they called repeatedly, and we soon saw them, seated on the water. It was too dark to see any but the nearest birds, so that an accurate count was impossible. The most that I counted at one time was twelve, but I believe it more likely that the number was somewhere between fifteen and twenty. When we got close to them, some of the birds flew, but most of them beat along the surface of the water with their wings as if unable to rise, and finally dove instead. The birds called repeatedly, the "south south southerly" call. Although we were unable to see them clearly enough in the moonlight to make out

anything, except that they were ducks, this call is so characteristic and unmistakable that the identification from it alone is certain.—ARETAS A. SAUNDERS, *Mt. Vernon, N. Y.*

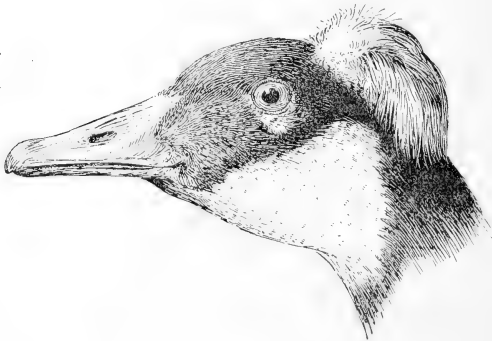
A Crested Canada Goose.—On February 15, 1913, three Canada Geese, all with a peculiar crest of feathers were shot from the same bunch of geese, near Pea Island, N. C.

Dr. H. B. Bigelow came into possession of the partial scalp of one of these curious birds and was good enough to turn it over to me.

From this piece of head skin I have had the accompanying drawing made. The crest is dirty brownish in color and the feathers are stiff and rather tightly curled.

The occurrence of this crest in a race of wild geese is interesting, because the crested Polish fowls and the breed of crested ducks are well known.

So far as I am informed there is no race of crested geese, though in Wright's *Book of Poultry*, 1886, p. 562, there is mention of the fact that in



crosses between Embden and Toulouse geese the majority of the gander and a fair proportion of the geese carry a slightly crested head.

Davenport showed (*Carnegie Institute Pub. no. 52*) that the crest of the Polish fowl was a dominant character, though the dominance was not perfect. The crest here is associated with a cerebral hernia.

The fact that three crested individuals were shot from this same flock of geese means that they belonged almost certainly to the same family, and that the crest was probably inherited as a dominant character.

If such a variation had occurred in captivity it could have been made the basis for a permanent race of crested Canada Geese.—JOHN C. PHILLIPS, *Wenham, Mass.*

Greater Snow Goose (*Chen hyperboreus nivalis*) in Arkansas.—On March 28, 1913, a farmer living three miles west of this city shot an adult male Greater Snow Goose in his field. The bird was seen feeding all day but no others of its species were observed near. I examined it carefully in the flesh and found it to be in perfect plumage. Dr. C. H. Luther of this city, who made it up into a skin, informed me that the specimen was in good condition and that he found only fresh wounds on the body.—ALBERT LANO, Fayetteville, Arkansas.

Feeding Wild Ducks on Sodus Bay, N. Y.—Sodus Bay, one of the largest bays on the southern shore of Lake Ontario, was the scene of an interesting experiment in the feeding of wild ducks during the months of February and March, 1913. The bay, which is a large irregularly shaped body of water, containing several islands, is frequented in the spring and fall by large numbers of ducks. The winter was unusually mild up to the first of February, and many ducks remained on a large area of the bay which was open, and where they apparently found plenty of food. About February 1 the weather turned suddenly cold, with heavy snow storms and high winds. This caused the bay to freeze entirely over, preventing the ducks from reaching their feeding grounds. On February 4 the weather was very stormy, and several thousand ducks were noted in places still remaining open. On February 5 Mr. Claude T. DeVille, the state game protector at Sodus Point, noted that the ducks were flying to places kept open by men harvesting ice. The ducks were very fearless and were apparently suffering from lack of food. On the succeeding day, February 6, he obtained a quantity of wheat, and tried feeding the ducks. The grain was readily eaten and he immediately wrote the New York State Conservation Commission, notifying them of the presence of the ducks and the necessity of relief measures. The Commission promptly responded, and on February 10, Mr. DeVille received word to purchase grain and feed the ducks. He first tried feeding by throwing the grain in the water, but the ducks were so weak that they apparently had difficulty in reaching bottom in sixteen feet of water. This fact alone shows the extremes to which the ducks were reduced, as they were mainly Bluebills, Redheads and Canvasbacks, all of which feed at considerable depths. He then tried placing the grain on the ice on a place scraped clear of snow near the edge of the open water. This proved successful, as the ducks immediately came out on the ice, feeding like barnyard fowls. At one place near where men employed by the Northern Central Railway Co. were harvesting ice, there were often six or seven hundred ducks feeding at one time. The ducks were fed in this manner at all the places which remained open, which varied from three or four to six or eight. They were fed at least once and often twice each day, and during the period from February 10 to March 10, when the feeding was discontinued, thirty-eight bushels of wheat were fed.

The ducks soon learned to look for the grain and upon seeing Mr. DeVille starting out on the ice, would fly to the places where the grain was placed.

At one time all the holes had frozen over, and the grain was placed on the bare ice, the ducks coming in from the lake and lighting on the ice to feed. This was at a distance of about a quarter of a mile from the open water in the lake. On February 21, being temporarily out of wheat, cracked corn was tried, but the ducks apparently did not relish it, and did not clean it up, as they did the wheat. During a period from February 12 to 16, Mr. DeVille estimated the number of ducks was at least ten thousand. They gradually scattered with the coming of milder weather, but there were several thousand still present on March 18.

The ducks were about seventy-five per cent Bluebills, or Scaups, the remainder being about evenly divided between Canvasbacks and Redheads, with a few Whistlers.

On March 13 when the writer visited the bay he counted in an open place between the outlet of the bay and Sand Point, about five hundred Bluebills, one hundred Redheads, a few Canvasbacks, about a dozen Mallard, three or four Black Ducks and several Holbøll's and Horned Grebes. At this time the ducks were apparently able to take care of themselves, were feeding in the usual manner, and did not come for the grain.

Mr. DeVille stated that the ducks were in such poor condition, that he had seen many with ice frozen to their feathers, the wing feathers being sometimes frozen together. Many also had balls of ice over the bill, often extending to the eyes. Fourteen ducks were found dead, eleven Bluebills, one Canvasback and two Redheads. One Bluebill drake found in full plumage weighed one pound and three ounces.

Great credit must be given to both Mr. DeVille, who is a game protector of a type we need more of, and the New York State Conservation Commission, for their prompt action in this matter, for there is no doubt that if they had not acted in time, thousands of ducks would have died of starvation.—H. E. GORDON, *Rochester, N. Y.*

Early Occurrence of Rails in Massachusetts.—On August 26, 1913, a Yellow Rail (*Coturnicops noveboracensis*) was taken in Longmeadow near Springfield, Mass., and on the 22d. of the same month, a King Rail, *Rallus elegans*, was captured in the same town.

These are the earliest autumnal dates recorded for the appearance of either of these species of birds in this part of the Connecticut Valley, although I believe that both kinds are more often represented here than is generally supposed, and it is possible that they breed here.

In Massachusetts, under a very unwise state statute purporting to be for the protection of certain kinds of so-called marsh birds, the open season for Rallidæ begins as early as August 1, and on that day in Longmeadow, a sportsman caught a young Virginia Rail that was still in the downy state, and probably not more than ten days old.—ROBERT O. MORRIS, *Springfield, Mass.*

Woodcock in Ohio Co., West Virginia.—The first authentic record of the occurrence of the Woodcock (*Philohela minor*) in Ohio County, West

Virginia, came under my notice on July 20, 1913. The writer has been a student of the bird life of this county for the past twenty years, yet this is the first time in his experience that he has been able to positively identify this game bird in this locality.

While sitting on the porch of our residence at Park View in company with his wife the writer was attracted by the peculiar fluttering of a bird which alighted upon the lawn about thirty feet distant. This characteristic and familiar flight recalled instantly to mind this bird which he had formerly often seen in the swampy land about Ithaca, N. Y., but never before here. The bird had hardly alighted before its long bill and large black eyes proclaimed it *Philohela minor*, but an exclamation of surprise from one of us caused it to fly again about ten feet farther away. The writer then followed the stranger behind the shrubbery until it flew into the garden in the rear of the house, where we both under cover of a friendly bush from a distance of only ten feet, calmly watched the owner of those large eyes bore in the damp ground of the potato patch for worms. The protective coloration did not hide it from view at such close range as it was but 8 o'clock in the evening and quite light. After watching the visitor for ten minutes we left him peacefully to pursue his way.—ROBERT B. McLAIN, *Wheeling, W. Va.*

Eskimo Curlew (*Numenius borealis*) in Massachusetts.—On September 5, 1913, an Eskimo Curlew was taken on the marsh at East Orleans, Mass., by Mr. John Greenough Rogers.

The bird was alone and when taken the weather was thick and raining with an east wind, and since the afternoon of the day before the wind had been northeast to east with rain most of the time.

After the bird was shot, what appeared like hardened whitish grease formed at the nostrils. The centre feathers of the under tail-coverts and the under sides of the ends of the tail feathers were stained a purple color. There was nothing in the stomach but the bird was very fat.

The specimen was preserved and is now in my collection.—CHARLES R. LAMB, *Cambridge, Mass.*

The Golden Plover (*Charadrius dominicus dominicus*) in Michigan in Spring.—In "Michigan Bird Life," 1912, 210, Prof. Barrows mentions that "although several observers have reported it as seen in spring I have not been able to find a spring specimen in any collection in the state, and it seems likely that these reports may be incorrect." There is a skin in the Museum of Zoology, University of Michigan, that was secured on April 20, 1890, by Mr. Norman A. Wood near Pittsfield, one mile north of Saline, Washenau County. There were a flock of some thirty birds feeding in a wet meadow and five were secured from this flock. Two specimens were mounted for some Chicago man, name now forgotten; these were nearly all black on the underparts. The specimen in the Museum collection is in a very advanced plumage.—B. H. SWALES, *Mus. of Zoology, Univ. of Michigan, Ann Arbor, Mich.*

Introduction of the Ruffed Grouse on Washington Island, Wis.—

While visiting Washington Island, Wisconsin, in July, 1913, I learned that Ruffed Grouse had been introduced and had apparently become successfully established. As cases of the successful introduction of this bird are rare it may be of interest to place on record such facts as I was able to obtain. Washington Island, situated in Door County at the entrance of Green Bay, has an area of about 15,000 acres and is largely covered with deciduous trees and some spruce, hemlock and arborvitæ. Its present population is about 1200. A strait known as Death's Door, some five miles in width, separates the island from the peninsula on the east side of Green Bay. So far as known, the Ruffed Grouse was not formerly found on the island. In 1900 Mr. Wm. Barnhart of Sturgeon Bay, deputy warden of Door and Kewaunee counties, having undertaken to introduce the species from the main land, advertised for live 'partridges' and secured several specimens. In September a female which had been captured in a house was brought to him, and a month later a male caught in a granary and a female caught in an enclosure of chicken wire, were secured. These birds were all liberated on the south side of the island near the post office at Detroit Harbor. During the following year similar efforts resulted in the acquisition of two more birds, a male and a female, which were liberated at the same place. These birds were kept in captivity only two or three days and were fed on mountain ash berries or thorn apples. Recently Ruffed Grouse have been reported at various points on the island even on the north shore, and last year fifteen were seen at one place, indicating that the species had bred and was increasing in numbers.—T. S. PALMER, *Washington, D. C.*

Actions of Nesting Red-shouldered Hawks.—

The Red-shoulder has endured persecution here in Wells County, Indiana, better than the Red-tail which has almost disappeared, and every year I am able to locate a few nests. To take the eggs and cause the birds to nest a second time when leaves are on the trees and nests less readily discovered gives the birds and their offspring a better chance of escaping the constant warfare waged on them. Birds once robbed of their eggs are more wary and have a better chance of escaping the guns of irate chicken owners.

On April 6 I climbed to a nest forty-six feet high in a beech. One of the parents remained in the top of the tree calling fiercely but not moving. No attention was paid to it or to the other parent which was not noticed at the time. Just as I stood up on tiptoes to look in the nest this other parent gave me a hard blow on the side of my head, fortunately striking the heavy felt hat I wore in which three sharp cuts about half an inch long were made. My scalp was slightly cut by the unexpected attack, which resulted in a decided headache. Being thus put on my guard, I watched this parent, which soon returned to the attack, flying from the top of a tall tree about one hundred and fifty feet from me, straight at my head. I struck at it, but missed and the bird swerved, missing my face by about a foot. A third similar attack was made, but in this case the bird missed me by about three

feet. All this time the other parent remained possibly fifteen feet directly over me, calling shrilly. In discovering this nest, as I entered the woods, I saw one parent sitting about twenty feet from the nest. The other bird left the nest when I rapped the tree with a small club. I did not climb at once, but walked on through the woods, both birds following, approaching closely, and calling frequently.

Later on in the day in another woods I saw a nest at some distance. As I approached, when possibly two hundred feet away, the parent slipped from the nest and flew silently and swiftly away. While climbing to this nest neither parent bird was seen or heard. After I returned to the ground they returned flying at a distance, at a great height and calling frequently.

The behavior of these birds was in striking contrast to that of the first pair, and it was the owners of the fresh eggs which were more aggressive.

The owners of five other nests found later showed none of the aggressiveness exhibited by the first pair usually remaining at quite a distance.

The aggressive pair built again and April 29 had a nest in a beech, one hundred feet from the former site. One parent left the nest as I approached and the other flew away when I was possibly fifty feet from the tree. The former bird remained near and several times flew within a few feet of me with angry cries but did not attack me.—E. B. WILLIAMSON, *Bluffton, Indiana*.

Metallura vs. Laticauda.—In 'The Auk' for January, 1902, page 92, Dr. Charles W. Richmond proposed to replace *Metallura* Gould 1847, by the earlier name *Laticauda* Lesson 1843, and the latter has been adopted in the recently published 'Birds of South America' by Brabourne and Chubb (Vol. I, page 137).

Fortunately, however, this change is unnecessary as there is an earlier *Laticauda* published by Laurenti in 1768 for a genus of serpents. Dr. Stejneger writes me that this is a perfectly valid name, diagnosed and with species. The genus of South American Hummingbirds will therefore retain its long established name, *Metallura*.—W. DEW. MILLER, *American Museum of Natural History, New York City*.

Hummingbirds' Eyelashes.—An interesting fact was brought to light while my friend Mr. H. Muller Pierce was examining some Hummingbirds in my collection. We were using a powerful magnifying glass and looking at the brilliant metallic feathers on the throat, and the difference in the shade of colors, as they appeared with and without the glass. Mr. Pierce remarked "look at the eye lashes on this one!" With the naked eye we could see only the tiny black rim of the cycloid about the size of a pin head, but with the glass we found both upper and lower lids adorned with a row of minute round feathers set at regular intervals, about twenty in all. Upon further examination of over one hundred species from North, Central and South America, we found these feathers were of two colors—the majority being black, the others pale grayish brown. One exception

was found, *Gouldia conversi* from Costa Rica, in which the eyelid feathers are metallic green. Of our North American Trochilidæ, *Eugenes fulgens*, *Archilochus colubris*, *Calypte costæ*, *Basilinna xantusi* and *Cyanthus latirostris*, have black eye lashes, while in *Calypte anna*, *Selasphorus platycercus*, *S. rufus*, and *S. alleni*, *Stellula calliope*, *Amizilis tzacall* and *A. cerviniventris chalconota*, they are brownish gray. The fact that the color of the eyelid feathers is alike in the male and female, may prove valuable in identifying certain species when other points fail; and the characters may be of value in the case of other small birds such as warblers, vireos, titmice, flycatchers, wrens, etc.—HENRY K. COALE, *Highland Park, Ill.*

The Great-tailed Grackle in New Mexico.—This note constitutes the first record of the occurrence of the Great-tailed Grackle (*Megaquiscalus major macrourus*) within New Mexico, as far as I can determine by examination of previous records.

One adult male specimen was brought in by Miss Fannie Ford of Las Cruces, New Mexico, on May 15, 1913. It was shot at her home, having been mistaken for a crow while flying about the corral. The measurements for this specimen come very near the minimum for this species. A pair of these birds is reported nesting at La Mesa, N. M., ten miles south of this place. The nest is placed in a large apricot tree in a dooryard. The birds are not at all shy but characteristically noisy! Their nesting is to be unmolested and it will be interesting to note if this is the beginning of a permanent residence or annual summer visitations to this place, or if it is merely a sporadic occurrence. It would seem that the conspicuousness of the species would have made record of it an easy matter had it occurred in this region to any extent previously.—D. E. MERRILL, *State College, N. M.*

The Night Song of Nuttall's Sparrow.—W. R. Lord, in his 'Birds of Oregon and Washington,' says of Nuttall's Sparrow, that, "Often, through the darkest nights, in the Virginia creeper or honeysuckle around the porch or piazza, he utters his plaintive song — seeming to say, as one sensitive observer has imagined it: 'Sweet, Sweet, listen to me, won't you.'"

I first noticed this peculiar habit on the night of April 16 when one sang at 10:15 P. M. The following night he sang at 11 P. M. during a hard rain. From this date I made nightly observations on this particular bird; the song continuing regularly until May 3, when it suddenly ceased, and on May 19 the nest containing four eggs was found in a rose bush tied to the side of the house. The following day all the eggs hatched. On the 28th something disturbed the young, causing them to leave the nest.

During this period the night song was not heard although the male continued to sing throughout the day; and not until June 2 was the night singing resumed. Then followed a period of song though not as regular as before, continuing to June 15th. Later I discovered that a second brood had been raised though not until too late for note taking.

The male appeared to roost in or near a raspberry patch not far from the nest, and except on rare occasions the song was heard from very nearly the same location.

The song itself was subject to considerable variation; in one phase the day song was closely followed, the change, if any, being a simple repetition of the closing notes. In the second phase, the final notes were greatly elaborated, suggesting a canary's most beautiful tones, only infinitely richer and finer. This phase was heard on two occasions and on neither of those nights did I hear the first.

The weather evidently has little influence upon the song, the chief factor connected with it seeming to be the stage of the reproductive cycle at a given time.—A. J. STOVER, *Corvallis, Oregon*.

Rose-breasted Grosbeak Breeding at Wheeling, West Virginia.—I wish to record the nesting and successful raising of a brood of young of the Rose-breasted Grosbeak (*Zamelodia ludoviciana*) in a small English hawthorn tree in our front yard during May, 1912. This year (1913) during the month of June a pair of this same species nested in a cherry tree in the front yard of my brother-in-law on the opposite side of the Park View Lane. This bird has become a frequent visitor in the spring and early summer and its shrill familiar voice is often heard along the small streams as well as along Wheeling Creek near Elm Grove, W. Va.—ROBERT B. McLAIN, *Wheeling, W. Va.*

The Orange-crowned Warbler at Englewood, N. J.—On May 18, Messrs. Nicholas F. Lensen, S. V. LaDow and I spent the whole day in the field around Englewood, N. J. Birds of all kinds were more abundant than any of us had ever previously observed. While exploring an apple orchard near Bergenfield, N. J., Mr. LaDow suddenly arrested our attention by exclaiming:—“Here’s something that looks like a Tennessee!” The bird, however, promptly disappeared. A few minutes later I heard an unfamiliar song, and following it up, I was pleased to see an Orange-crowned Warbler (*Vermivora celata celata*) in full song, just above my head on a dead twig of one of the apple trees. The first thing I noticed was the greenish underparts with faint dusky streaks on the breast, very distinct from the bright yellow of the Nashville and the pure white of the Tennessee Warbler. The next thing I noticed was that there was no white superciliary stripe, and the color of the underparts scarcely differed from that of the upperparts. The song was very distinct and characteristic—*chíp, chíp, chíp-chíppee, chíppee-chíppee*—the last notes about twice as fast as the first three. The bird was under observation in bright sunlight for ten minutes, and the whole party were equipped with powerful binoculars.—LUDLOW GRISCOM, *New York City*.

The Louisiana Water-Thrush (*Seiurus motacilla*) in Sudbury, Massachusetts.—On May 21, 1913, in the afternoon of a day spent in

the vicinity of the Wayside Inn I was standing on the dam of a pond looking down upon the bush growth bordering the outlet stream at its fall, when a bird flew up onto a low bough about on the level of my knees and remained on the perch it had taken. Its position was less than ten feet away with the breast toward me. I saw at once that it was a water-thrush, but perceived also at the first full look that the throat was unstreaked and white; that the superciliary stripe was strikingly white; and that the streakings of the breast were continued only at the sides leaving the underpart below the breast unstreaked. It was, therefore, recognized as a Louisiana, and not a Northern, Water-Thrush. There was scarcely a tinge of buff on the underparts as they were presented to me. The bird scarcely moved for probably five minutes. The range of view was so near that I had no need to use the field-glass. No leaf or twig intervened between us. As the aspect was essentially a full front view, I could not perceive that the bill was larger than the bill of the northern species. This distinctive feature, however, was not needed for an unmistakable identification. When, after something like a five-minute period of time during which the bird was resting from all activity and I, so to speak, was photographing it upon my retina, I moved a step for a slight change in point of view, it became aware of my presence and instantly taking wing disappeared among the bushes below and was not seen again.

The only fully accepted record of the Louisiana Water-Thrush in Eastern Massachusetts, so far as I am aware, is that of one seen by Mr. Bradford Torrey at Wellesley Hills, Mass., on April 13, 1902, which "remained for at least ten days, being last seen on the 22d" (Auk, XIX, 1902, p. 292). One other record (Auk, XIX, 1902, p. 292) of a bird seen by Messrs. Francis G. and Maurice C. Blake on the north bank of the Charles River above Waltham in 1902 bears the date of May 21. This record Mr. William Brewster in his 'Birds of the Cambridge Region,' p. 398, is inclined to discredit for reasons which he states. I may be allowed, perhaps, an expression of more confidence in the correction of the identification from my knowledge of the Blake brothers as very careful observers through much companionship with them afield at that time. The date of their record, it will be observed, is identical with this record which I am now able to furnish.

I had already visited the waterfall at noon on my way farther and had not seen the bird, but upon the second visit in the middle of the afternoon it presented itself at once under the most favorable conditions of view, as has been described. I visited the spot again three days later, but the water-thrush which was then present was as clearly *Seiurus noveboracensis noveboracensis* as the bird of the 21st was *Seiurus motacilla*.

The location of this Louisiana Water-Thrush was rather less than a mile from the nesting place of the pair of Blue-winged Warblers in 1909 (Auk, XXVI, 1909, p. 337).—HORACE W. WRIGHT, *Boston, Mass.*

Kentucky Warbler in Massachusetts.— On June 22, 1913, while walking in the Arnold Arboretum, at Jamaica Plain, Massachusetts, the writer heard the call note of a warbler followed almost immediately by a song very much different from that of the regular local members of the family. The bird was finally placed in a low moist spot which was covered with rather a heavy growth of high bushes near some oak trees and a spring. I was very much surprised when it proved to be a finely plumaged male Kentucky Warbler (*Oporornis formosus*). The bright yellow underparts and the black stripe running down the side of the throat were quite conspicuous. The black crown was not so plain, although the yellow about the eye was easily seen. There was not any white evident in the plumage. The warbler was observed from about 12.30 to 1.15 p. m. and was in song most all of the time. The notes seemed to the writer to be rather like two of those of the Ruby-crowned Kinglet (*Regulus calendula calendula*), also recalled the Carolina Wren (*Thryothorus ludovicianus ludovicianus*). The song was a loud clear whistle of three or four double notes. While under observation the bird did not at any time perch above twenty feet from the ground nor did it fly over a rod from the place where it was first seen. Once I approached to within six feet of it.

Supposing at the time that this was the first record of an *Oporornis formosus* for Massachusetts and desiring corroboration I telephoned to Mr. Richard M. Marble of Brookline, who, with Mr. Joseph Kittredge, Jr., also of Brookline, met me in the Arboretum, that same afternoon. The bird was soon found and both Mr. Marble and Mr. Kittredge identified it as a male Kentucky Warbler (*Oporornis formosus*). The late date, June 22, led me to look for some signs of breeding, but although I searched for several days afterwards I was unable to find even the bird.

This appears to be the second record for Massachusetts, as Mr. Horace W. Wright reports one at Wellesley on May 14, 1907 (Auk, July, 1907).— HAROLD L. BARRETT, *Jamaica Plain, Mass.*

Some Observations on a Pair of Brown Creepers (*Certhia familiaris americana*).— On June 11, 1913, while walking through a strip of woods on Cape Elizabeth, Maine, in company with Mr. A. H. Norton of Portland, I found a pair of Brown Creepers among the dead trees along the banks of a brook. Most of these were evergreen trees and a great many of them were dead with pieces of the bark still attached. A careful search failed to reveal any sign of the nest, which I felt sure must be somewhere in the vicinity.

On June 14, I returned to the same place and found the birds again. I watched them and found that they were gathering something from the trunks of the trees. I kept my eyes on one of the birds which had its bill full of something, and saw it disappear off to my left. I changed my position about twenty-five yards and within five minutes had the pleasure of seeing one of the birds disappear in a hole under a large piece of bark on a fir stump.

My time was limited and I was only able to see that both birds visited the nest and that neither of them went directly to the nesting tree but went first to a hemlock tree which was about six feet away.

On June 17, I again returned, prepared to stay as long as there was sufficient light to see by. My observations began at about 3:15 P. M. and were tabulated as follows:

- 3: 19 both birds came to the nest,
- 3: 20 one bird
- 3: 22 " "
- 3: 23 one bird; both then came to trees within 15 feet of me, one on either side.
- 3: 24½ one bird,
- 3: 26 same bird,
- 3: 35 both birds, one waiting at the entrance till the other left,
- 3: 37½ one bird, staid half a minute,
- 3: 38 " " " " " "
- 3: 39 " " " " " "
- 3: 41 " "
- 3: 50 " " staid half a minute,
- 3: 51 " "
- 3: 56 both birds in succession,
- 3: 59½ one bird
- 4: 08 " "
- 4: 12 " "
- 4: 14 the other bird, both in sight,
- 4: 17 one bird
- 4: 18 " " staid half a minute
- 4: 22 " "
- 4: 27 " " staid half a minute, followed immediately by the other bird,
- 4: 36 one bird with what looked like birch bark or moth wings of some kind,
- 4: 38 one bird followed immediately by the other,
- 4: 41 one bird with moth or flying insect of some kind.

On one trip I thought I saw one of the birds taking the excreta from the nest to a tree about fifty paces away, but up to 4:41 I believed that the birds were building. After the visit at that time I was confident that they were feeding young and I went over to the nest to investigate. I enlarged the entrance hole a trifle and looking in could see two young. I put one of my fingers into the hole and could hear the young birds climbing up inside the bark. When I looked into the nest again it was apparently empty. I then started to remove the piece of bark to which the nest was attached and all except one of the young birds left the nest and flew away, making flights of about twenty yards.

As soon as the young birds began to leave the nest the parents became very excited and one of them, probably the female, alighted on a tree

almost within reach. Once she flew by my head so close that I could hear the buzzing of her wings. She continued to fly around me as long as I remained in the vicinity of the nest. The other parent bird appeared very much alarmed too, but never ventured nearer than fifteen feet. Both birds kept up a continual scolding.

The young had left the nest so quickly that I was unable to count them but I thought that five birds left the nest, which, with the one remaining in the nest would make the total of six. This seems to be in keeping with other records which have been published.

After examining the nest I went back to my observing point and waited to see what would be done about the young bird left in the nest. One of the parent birds returned twice but would not go inside. I found one of the birds which had left the nest and the parents became very much alarmed when I tried to catch it.

The entrance to the nest was six feet above the ground: it was two and a half inches long and three quarters of an inch wide. It was so narrow that it was impossible for the parent birds to go into the nest in a natural manner; they invariably entered and left the nest head first with the back toward the stem of the tree. In all visits neither bird ever flew directly to the nesting tree, always going first to the hemlock above referred to.

The nest was secured to the bark rather than to the stem of the tree but in loosening the bark I noticed several silk like threads leading from the nest to the stem of the tree. On the detached nest these show as little balls of dark gray material, probably from the cocoon of some caterpillar. The nest is formed principally of twigs of the fir, these being used to make the foundation of the nest where the bark is some distance from the stem. It is lined with pieces of birch bark and the inner bark of the fir. The rim of the nest has the usual crescent shape, the horns being two inches and a quarter higher than the rim of the nest proper. The depth of nest outside is seven inches, inside two inches, outer diameter six inches, inner diameter three inches, greatest thickness of nest (lower or foundation part) is two inches. The nesting site is about one and one half miles from the ocean and at an altitude of about forty-five feet. This is the first record of the breeding of the bird in this vicinity.

The only call I heard was the "tset" usually heard when the birds are flying from one tree to another. This call was almost invariably given when the birds were coming to the nest. Several times I saw one of the birds alight on the hemlock tree near the nest, and with wings aquiver give the same call. Its manner and appearance then were those of a well grown young bird calling for food.— I. RALPH MEYER, LIEUT. U. S. A., Fort McKinley, Portland, Me.

Bicknell's Thrush in Franconia Notch, N. H.— Last summer (1912) a friend and myself found a thriving colony of Bicknell's Thrush (*Hylocichla alicia bicknelli*) on Mt. Pemigewasset, New Hampshire, at an

elevation of 3,300 ft. On June 29, 1913, we found them at Lonesome Lake, 2800 ft., which is on top of one of the spurs of Cannon. We noted six singing males and saw one bird singing at a range of ten feet. The Olive-back was also present. We did not see them here last year. They were near the path in a mixed growth of fir, balsam, and spruce, yellow and black birch, rock maple and mountain ash.—ALICE COREY, *Plainfield, N. J.*

Destruction of Robins in a Storm.—There occurred on Long Island about midnight, Friday, August 29, the most severe electric storm I have ever witnessed. During my forty years of residence at Floral Park, I have never known a summer storm so severe as to kill any mature bird in full strength, but the one above referred to annihilated the Robins that live in the trees about my lawn. Thirty-six were picked up the next morning on about an acre of ground, and others in the near vicinity brought the total up to about fifty. The English Sparrows were very abundant also but very few were killed; the Starlings escaped uninjured as far as I can learn. I have hardly seen a Robin since that fatal night. The storm was accompanied by high wind although not severe enough to uproot trees or break branches to any considerable extent, but it was accompanied by the heaviest downpour of rain I have seen in many years and lasted for a considerable time.

The birds were evidently blown out of the trees where they were roosting and perished from the awful wetting they were subjected to on the ground.—JOHN LEWIS CHILDS, *Floral Park, N. Y.*

Some Land Birds at Sea.—While traveling from New Orleans, La., to Havana, Cuba, in May, 1913, I was much interested to find that there were several wild birds taking passage with us. We left the mouth of the Mississippi River about 10 A. M., May 11, and next morning, we were probably more than half way across the Gulf of Mexico. It was then that I discovered aboard the vessel a Kingbird (*Tyrannus tyrannus*), a Barn Swallow (*Hirundo erythrogastra*), a Catbird (*Dumetella carolinensis*), and a swallow that I did not positively identify. The Kingbird would fly far out to one side, keep pace with the vessel awhile, and then return and perch on the rigging. The Barn Swallow's chief amusement seemed to be flying up and down the length of the decks; but the poor Catbird appeared rather bedraggled, and as far as I could observe, had no occupation. In the afternoon of the same day I discovered a warbler, unknown to me, hopping about the main deck aft. It seemed perfectly at home and allowed a rather close approach. We reached Havana very early next morning (May 13) so I have no idea when our bird passengers left us. These birds stayed with us practically the whole day (May 12) and I think the Catbird was seen by some of the passengers the night before. It seems remarkable that the birds should have remained so long on the vessel and allowed themselves to be carried many miles in a direction opposite to that of their migration.—ERNEST G. HOLT, *U. S. Biological Survey, Washington, D. C.*

Method of Recording Bird Music, with a Correction.— In my articles on the expressions of emotion in the Mourning Dove and the Passenger Pigeon ('The Auk,' October, 1911), in the musical notations I used sharps and flats in some cases to indicate a degree of sharpness or flatness less than a semitone. In the Mourning Dove record No. 1, the second note is only a trifle sharp; and the Passenger Pigeon records Nos. 4, 5, 7, and 8 each contain a downward run in which the intervals between successive notes are less than a semitone. I ought to have explained this in the original paper.

To measure the *tempo* of a bird song, the best instrument is a stop-watch. While the bird is singing, count the beats of its song, "Naught, one, two, three, . . ." Start the stop-watch with "Naught" and stop it with "ten." This gives a very accurate result. If the beats be rapid, count twenty instead of ten. In absence of a stop-watch, I think the best one can do is to count the beats for five seconds, or some other definite number of seconds, by an ordinary watch; but this is far less accurate.— WALLACE CRAIG, *Orono, Maine.*

RECENT LITERATURE.

Regulations for the Protection of Migratory Birds.¹— Under the provisions of the so-called McLean act the U. S. Department of Agriculture has been entrusted with the protection of our migratory birds. A committee was appointed by the Acting Secretary from the staff of the Biological Survey, consisting of Dr. T. S. Palmer, chairman, Dr. A. K. Fisher and Prof. W. W. Cooke, to draw up suitable regulations for the purpose and these together with a circular of explanation were issued late in June, to become effective October 1, 1913, after approval by the President.

The regulations are ten in number:

- I. defines migratory game and insectivorous birds.
- II. provides a closed season at night i. e.— from sunset to sunrise, on all migratory birds.
- III. provides a continuous closed season on migratory insectivorous birds, except an open season on Reedbirds in Delaware, Maryland, District of Columbia, Virginia and South Carolina, September 1–Oct. 31. Scientific collecting permits however are to be granted as at present.

¹ Proposed Regulations for the Protection of Migratory Birds. Circular 92, Bureau of Biological Survey, U. S. Dept. Agric. pp. 1–6. June 23, 1913.

Explanation of the Proposed Regulations for the Protection of Migratory Birds. Circular 93, Bureau of Biological Survey, U. S. Dept. Agric. pp. 1–5. June 23, 1913.

- IV. establishes a five year closed season on Band-tailed Pigeons, Little Brown, Sandhill and Whooping Cranes, Swans, Curlew, and all shore birds except the Black-breasted and Golden Plover, Wilson's Snipe, Woodcock, Greater and Lesser Yellow-legs. Also on Wood Duck in the northern and middle states west to Wisconsin, and on the Woodcock in Illinois and Missouri.
- V. prohibits shooting on the Mississippi and its branches from Minneapolis, Bismarek and Pittsburgh southward to New Orleans from January 1 to October 31.
- VI. divides the states into two zones; No. 1, those lying mainly north of latitude 40° and the Ohio, and No. 2 those lying mainly south of this line.
- VII. states that in reckoning closed seasons the first date mentioned is included and the last excluded.
- VIII. establishes closed seasons in Zone No. 1.

Waterfowl, December 16–September 1. Exceptions: Massachusetts January 1–September 15; Minnesota and North Dakota, December 16–September 7; South Dakota, December 16–September 10; Oregon and New York outside of Long Island, December 16–September 16; New Hampshire, Long Island, New Jersey and Washington, January 16–October 1.

Rail. December 1–September 1. Exceptions: Massachusetts and Rhode Island, December–August 1; New York including Long Island, December 1–September 16; California and Vermont, closed until September 1, 1918.

Woodcock. December 1–October 1. Exceptions: Maine and Vermont, December 1–September 15; Massachusetts, Connecticut and New Jersey, December 1–October 10; Rhode Island, Pennsylvania and on Long Island, December 1–October 15; Illinois and Missouri, closed until September 1, 1918.

Shorebirds (Black-breasted and Golden Plover, Wilson's Snipe and Yellow-legs) December 16–September 1. Exceptions: Maine, Massachusetts and on Long Island, December 16–August 1; Minnesota and North Dakota, December 16–September 7; South Dakota, December 16–September 10; Oregon, and New York other than Long Island, December 16–September 16; New Hampshire and Washington, December 16–October 1.

- IX. establishes closed seasons in Zone No. 2.

Waterfowl. January 16–October 1. Exceptions: Kansas, Oklahoma, New Mexico and Arizona, December 16–September 1; Maryland, Virginia, North Carolina and South Carolina, February 1–November 1.

Rails. December 1–September 1. Exceptions: Tennessee and Louisiana, December 1–October 1; Arizona, December 1–October 15.

Woodcock. January 1–November 1. Exceptions: Louisiana, January 1–November 15; Georgia, January 1–December 1.

Shore birds. (Black-breasted and Golden Plover, Wilson's Snipe

and Yellowlegs) December 16–September 1. Exceptions: Alabama, December 16–November 1; Louisiana and Tennessee, December 16–October 1; Arizona, December 16–October 15, Utah, Snipe, December 16–October 1; plover and Yellowlegs, closed until September 1, 1918.

X. provides for hearings regarding proposed changes in the regulations. Applications should be made to the secretary of Agriculture and applicants should be prepared to show necessity for changes and submit evidence other than that based on personal convenience.

These regulations seem to us eminently fair and the sportsmans' interests have been given as much consideration as was compatible with the saving of the birds from extinction. Naturally there will be objections especially from points near zone or state boundaries, where different laws prevail on either side, as in southern New Jersey where Reedbird shooting is prohibited while on the other side of the Delaware River in the state of Delaware it is permitted. It seems unfortunate that the shooting of this bird could not have been stopped entirely except on the rice plantations of the south. Critics of the regulations should bear in mind that the welfare of each species as a whole has been the guiding principle of the committee, and without more or less drastic action at the present time the shooting of various birds would cease entirely in a short time, not through legislation but through the extermination of the species. Let all parties work together for the enforcement of the regulations irrespective of personal opinion or inconvenience for five years and it will be interesting to see what results will be apparent.— W. S.

Townsend's 'Sand Dunes and Salt Marshes.'¹— Dr. Townsend is already well known as a writer on nature and the present volume will be read with much interest by all who love the 'great outdoors'. He combines with an attractive style the keen observation of a trained field naturalist and the scientific regard for absolute accuracy, and his writings are therefore peculiarly satisfying.

The present volume deals mainly with the dunes and marshes of Ipswich, Massachusetts, and is based upon observations made during summer vacations and other brief visits during some twenty years. The chapter headings are: Sand Dunes; Tracks and Trackings; Vegetation in the Dunes; Land Birds of the Dunes; Swallow Roosts and Swallow Migration; Water Birds seen from the Dunes; The Harbor Seal; Salt Marshes — Their Past and Future; Birds of the Salt Marshes; The Horseshoe Crab and other Denizens of Sand and Mud; — and lastly a chapter on Bird Genealogy reprinted from 'The Auk' for July, 1912.

¹ Sand Dunes | and | Salt Marshes. | By | Charles Wendell Townsend, M. D. | Author of "The Birds of Essex County," "Along the Labrador Coast," "A Labrador Spring" and "Captain Cartwright and His | Labrador Journal" | with numerous Illustrations from Photographs | Boston | Dana Estes & Company | Publishers. Svo. 1-311.

The ornithologist will find many of these sketches replete with observations on bird habits and behavior.

The flight of gulls, the courtship of wild ducks, the booming of the bittern and the plumage changes of the sandpipers are all discussed. Besides, the Ipswich Sparrow, Pipit, Shore Lark and a few other land birds which one naturally expects to find along the shore, a surprising list of warblers — twenty-one species — has been observed among the dune trees in migration times.

In the make-up of Dr. Townsend's book the publishers have done their part well and the typography and binding are as attractive as is the text.— W. S.

Bailey's 'The Birds of Virginia.'¹— The wealth of excellent illustrations and the admirable typography unite in making Mr. Bailey's book one of the most attractive state lists that has yet appeared. The halftones are from photographs by the author and by many of his correspondents in different parts of the country, especially Messrs. C. F. Stone, O. E. Baynard, Thomas H. Jackson, W. Otto Emerson and Verdi Burtch, while the color plates are from paintings by Mr. E. L. Poole of the Delaware Valley Ornithological Club, a young artist who gives much promise as a portrayer of animal and bird life.

The text consists of a statement of the range of each species reprinted from the A. O. U. Check-List with occasional alterations by the author and about a page descriptive of nest and eggs, local distribution, abundance and economic status; acknowledgment being made to the U. S. Department of Agriculture for data on the food of a number of species.

The matter thus presented combined with the extremely attractive make-up of the book will go far to realizing one of the objects of the publication, as set forth in the preface — namely to stimulate interest in our native birds and their welfare. Such a stimulus has long been needed in Virginia and other southern states and for this purpose especially Mr. Bailey's book should be welcomed. It is to be regretted however, that the text could not have been given the benefit for a careful editorial revision, for while remarkably free from typographical errors it is carelessly and loosely thrown together evidently under pressure of time with the result of being sometimes distinctly ungrammatical.

With regard to the author's second aim, to provide a "thorough systematic work on the breeding birds of the state for the needs of the advanced ornithologists of our country," his volume is adequate so far as containing probably all the species and subspecies which breed in Virginia but it is frequently lacking in the detailed data that characterize modern ornithologi-

¹ The Birds of Virginia | By | Harold H. Bailey | with fourteen full page colored plates | one map, and one hundred and eight | half-tones taken from nature | treating one hundred and eighty-five species and subspecies: | all the birds that breed within the state | 1913 | J. P. Bell Company, Inc. | Publisher | Lynchburg, Va. | Svo. pp. i-xxiii, and 1-362.

cal work. For instance the Olive-sided Flycatcher, Crossbill, Pine Siskin, Golden-crowned Kinglet, Brown Creeper, etc. are given as breeding birds without any actual records or references to records, while so far as we can judge their nests have not been taken in the state by the author. It is the actual records that the scientific ornithologist requires or at least an indication of where they may be found and an adequate state list should furnish this information. In the case of the Brown Creeper, moreover, one might suppose that it bred throughout the state as there is no mention whatever of its local summer distribution. The author seems not to have a clear conception of the nature of subspecies as he states that the breeding ranges of the two *Parulas*, the two Maryland Yellow-throats, etc., overlap in Virginia. If such is the fact, from the very nature of the case, they would cease to be subspecies and must be regarded as species. The remarks about winter Juncos must we think apply largely if not entirely to *J. hyemalis hyemalis* not to *J. h. carolinensis* which is the breeding form of the mountains.

One point in which Mr. Bailey's work is especially open to criticism from the 'advanced ornithologist' is the lack of any sort of bibliography and the very meagre reference to the work of others. Prof. Smyth's recent paper in 'The Auk' is freely quoted and there is an occasional reference to Dr. Rives' 'Birds of the Virginias,' but many other important records and papers could have been quoted to advantage. We trust that these may be supplied in another edition, as well as the editorial revision already suggested, which will bring the text up to the high standard attained in the illustrations and general make-up of the volume.—W. S.

Faxon on Brewster's Warbler.¹—In January, 1911, Dr. Faxon published an interesting account of observations on some families of warblers in a swamp at Lexington, Mass. A pair of Golden-wings reared only Golden-wings, a male Golden-wing and female Brewster's Warbler produced only Brewster's Warblers while another similarly mated pair produced Brewster's Warblers and at least one Golden-wing.

Observations on the colony were continued in subsequent seasons by the author and Dr. W. M. Tyler but with no satisfactory results until 1913, when a male Golden-wing was found mated with a female Blue-wing, the combination that was particularly to be desired. The development of the young was followed with great care and all of them eventually assumed the pure plumage of Brewster's Warbler, thus proving positively the nature of this so called species. As Dr. Faxon points out this is in exact accordance with Mendel's law, *chrysoptera* (pure) × *pinus* (pure) should produce only *leucobronchialis*, a Mendelian so called dominant hybrid; *chrysoptera* (pure)

¹ Brewster's Warbler (*Helminthophila leucobronchialis*) a hybrid between the Golden-winged Warbler (*Helminthophila chrysoptera*) and the Blue-winged Warbler (*Helminthophila pinus*). By Walter Faxon. *Memoirs Mus. Comp. Zool.* Vol. XL. No. 6, pp. 311-316. August, 1913.

× *pinus* (impure) should produce on the average *chrysoptera* and *leucobronchialis* in equal numbers; *chrysoptera* (impure) and *pinus* (pure), *pinus* and *leucobronchialis* in equal numbers, while a union of impure examples of each stock should produce equal numbers of *chrysoptera*, *pinus*, *leucobronchialis* and *lawrencei*. One of the young of this brood has been banded as well as a young Brewster's and Golden-wing, the offspring of a male Brewster's and female Golden-wing which were also under observation.

Should these birds return to the same swamp next year a family pedigree of three generations can be established. Be that as it may Dr. Faxon has finally demonstrated the true nature of Brewster's Warbler and removed from the field of discussion a topic which has for years been a favorite one upon which to build up theories and conjectures.— W. S.

The Natural History of the Toronto Region.¹— This handy volume "has been prepared by the Canadian Institute for the members of the Twelfth Geological Congress and for all who may have an interest in the history and natural history of the city and vicinity." It consists of chapters on the history, geology and life zones of the region, with lists of the various groups of animals and plants contributed by specialists; some merely nominal, others with annotations.

The lists of mammals and birds are by James H. Fleming and are accompanied by brief notes on the relative abundance and time of occurrence of the species, while the former is preceded by a short historical bibliography. Forty-one mammals and 292 birds are listed and the nomenclature is strictly up to date. The book will be of great assistance both to visitors and residents who wish to know something of the natural history of Toronto and to all ornithologists who desire an accurate reference list of Toronto birds. The typography and paper are good, and both publisher and editor are to be congratulated upon their work.— W. S.

Mathews' 'The Birds of Australia.'²— In the continuance of his great work, Mr. Mathews treats of the Limicolæ. We note the following new genera, *Anteleotringa*, p. 274, type *Totanus tenuirostris* Horsf.; *Ditelmatias*, p. 282, type *Gallinago hardwickii* Gray; *Parascolopax*, p. 290, type *Scolopax saturata* Hodgs.; *Chubbia*, p. 291, type *Gallinago stricklandi* Gray; *Homoscolopax*, p. 291, type *G. imperialis*; *Neospilura*, p. 293, type *Scolopax solitaria*; *Eugallinago*, p. 294, type *G. macrodactyla* Bonap. and *Subspilura*, p. 295, type *G. megala* Swinhoe. New subgenera are: *Nesopisobia*, p. 245, type *Totanus damacensis* Horsf.; *Macrodrura*, p. 294, type *G. nobilis*; *Odurella*, p. 294, type *G. brasiliensis* Sw.

¹ The natural History of the Toronto Region | Ontario, Canada | edited by | J. H. Faull, B. A., Ph.D. | Associate Professor of Botany, University of Toronto | Toronto | Published by the Canadian Institute | 1913. Svo. pp. 1-419, seven halftone plates and five maps. William Briggs, publisher, Toronto, Ont. \$2.

² The Birds of Australia. By Gregory M. Mathews. Vol. III, part 3, pp. 205-300. August 18, 1913. Witherby & Co., 326 High Holborn, London, W. C.

Some changes in nomenclature affect North American birds, for instance *Pisobia aurita* (Latham) must become *P. acuminata* Horsf. since Mr. Mathews states that Sharpe was clearly in error when he claimed that Watlings drawing 244, upon which Latham based his name, represented this bird. It is obviously *Actitis hypoleucos*. Mr. Mathews moreover divides the genus *Pisobia* and places this species in *Limnocinclus*; *Actodromas* being a synonym of true *Pisobia* with *P. minuta* as its type.

The name of the Pectoral Sandpiper must change also, since *Tringa maculata* Vieill. is rendered invalid by *T. maculata* Linn. 1766, we therefore return to *pectoralis* of Say.

The American Knot is separated as *Canutus canutus rufus* Wilson while the Japanese race is described as new under the name *C. c. rogersi*.— W. S.

Mearns on New African Birds.¹— In working over the rich collections of African birds in the U. S. National Museum obtained mainly by himself, Dr. Mearns finds the following new Weaver-birds and Thrushes, *Estrilda rhodopyga polia*, from the Gato River, Southern Abyssinia, *E. rhodopyga hypochra*, *Granatina ianthinogastra roosevelti*, *Planesticus helleri*, *P. olivaceus polius*, *Geocichla piaggiae keniensis* and *G. gurneyi raineyi* from British East Africa. While Dr. Mearns' first aim is naturally the description of the new forms obtained by him, ornithologists will await with interest a general account of the collections made on the Smithsonian and the Childs Frick Expeditions which he accompanied as naturalist.— W. S.

Riley on the Bahama Barn Owl.²— While accompanying the Bahamas Expedition of the Geographic Society of Baltimore a few years ago, Mr. Riley obtained a specimen of a peculiar looking Barn Owl which in the light of additional material now available he describes as new, under the name of *Tyto perlatus lucayanus*.— W. S.

Shufeldt's Studies of Fossil Birds.³— In the former of two recent publications on North American fossil birds, Dr. Shufeldt presents the results of a reëxamination of the Cope and Condon Collections and a study of

¹ Descriptions of three new African Weaver-birds of the Genera *Estrilda* and *Granatina*. By Edgar A. Mearns. *Smithson. Misc. Collns.*, Vol. 61, No. 9, pp. 1-4. July 31, 1913.

Descriptions of four New African Thrushes of the Genera *Planesticus* and *Geocichla*. By Edgar A. Mearns. *Smithson. Misc. Collns.*, Vol. 61, No. 10, pp. 1-5. August 11, 1913.

² The Bahama Barn Owl. By J. H. Riley. *Proc. Biol. Soc. Washington*, XXVI, pp. 153-154. June 30, 1913.

³ Review of the Fossil Fauna of the Desert Region of Oregon, with a Description of additional Material collected there. By R. W. Shufeldt. *Bull. Amer. Museum Nat. Hist.*, Vol. XXXII, Art. VI, pp. 123-178. New York, July 9, 1913.

Further Studies of Fossil Birds with Descriptions of New and Extinct Species. By R. W. Shufeldt. *Bull. Amer. Mus. Nat. Hist.*, Vol. XXXII, Art. XVI, pp. 285-306. New York, August 4, 1913.

other material belonging to the U. S. National Museum and the American Museum of Natural History.¹ A large amount of material is illustrated in half-tone, comprising 578 figures of bones or fragments arranged on 35 plates.

Colymbus parvus, *Polilymbus magnus*, *Phalacrocorax macropus* and *Olor matthewsi* from the Oregon Pleistocene are described as new.

In a second paper additional collections belonging to the same institutions are described. Ninety-six specimens are figured on nine plates. *Diatryma ajax*, and *Palæophasianus* (gen. nov.) *meleagroides* from the Wasatch of Wyoming, are described as new, also *Aquila antiqua*, *A. ferox*, and *A. lydekkeri* from the Bridger Formation, Wyoming, and *Proictinia gilmorei*, from the Loup Fork of Kansas.—W. S.

Hahn on the Future of the North American Fauna.²—The late Dr. Hahn whose unfortunate death was mentioned recently in 'The Auk' has contributed a suggestive paper under the above title. While he has in mind animal life as a whole most of his remarks refer equally well to birds and he constantly quotes birds as examples. We cannot do better than to quote his own résumé in order to give an idea of the manner in which he has treated the subject. "Briefly the tendency of the North American fauna is toward mediocrity. Large species are giving way to small; bizarre species to commonplace. Marsh-loving and forest-loving animals disappear with the advance of civilization, and grass-loving species that are able to exist in fence rows and pastures survive. Animals that yield products of value vanish before the hand of man; likewise his enemies are destroyed unless protected by small size and great fecundity. Courage and the social instinct are at a discount and cunning and timidity at a premium."—W. S.

Doolin's 'Field, Forest and Stream in Oklahoma.'³—In this attractively printed and well illustrated volume, Mr. Doolin sets a high standard for game wardens' reports. As he says in his 'foreword': "An annual report which recorded merely receipts and expenditures would convey no information such as might lead the public to an understanding of the problems and difficulties that confront those who are desirous of saving all useful forms of wild bird and animal life from extermination. It is especially the purpose of this report to ask the people of Oklahoma for their fullest co-operation in the protection and conservation of disappearing wild life in this state."

¹ Cf. 'The Auk,' 1913, pp. 36-39, for a preliminary review of this study.

² The Future of the North American Fauna. By the late Walter L. Hahn, Ph.D. Pop. Sci. Monthly, August, 1913, pp. 169-177.

Cf. p.

³ Field, Forest and Stream in Oklahoma. Being the 1912 Annual Report of the State Game and Fish Warden, John B. Doolin, to the Governor of the State of Oklahoma, the Honorable Lee Cruce. Roy Svo. pp. 1-159.

Following out these lines the author presents a number of interesting and readable chapters describing the beauties of field and forest in his state; fishing and hunting experiences and anecdotes of white man and Indian; and through it all is brought out the necessity for united effort in cultivating a proper appreciation of nature and in saving the wild life from extermination. Beside chapters on Water-fowl and Wild Turkeys there is a 'tentative list' of the birds of Oklahoma compiled by Prof. George W. Stevens of the Northwest Normal School and Oklahoma Geological Survey, which consists of 227 species with brief notes as to the character of their occurrence. This we believe constitutes the first Oklahoma 'state list.'—W. S.

Craig on the Stimulation of Ovulation in Birds.¹—Largely from a study of pigeons the author finds that egg-laying can be induced without the true sexual stimulus and comes to the conclusion that it is the result not of a single stimulus but of a complex in which environmental conditions play an important part. He cites the mating of two female pigeons with ovulation by both, and the influence of the nest and eggs in restraining the incubating pigeon from further sexual activity, in presenting his conclusions.—W. S.

Laubmann on Birds from Thian-Schan.²—This paper is based upon a collection of 1234 skins obtained by Dr. Gottfried Merzbacher in the Thian-Schan Mts., Turkestan in 1907-8. 198 species are listed with notes as to their relationship, distribution, etc. and synonymic references to other papers dealing with the same general region, a list of which is given in a bibliography. No new forms are described, but the paper forms a valuable contribution to the ornithology of the Chinese Empire.—W. S.

Stresemann, on East Indian Birds.³—Mr. Stresemann in a recent contribution to the 'Novitates Zoologicae' continues his miscellaneous notes on Indo-Australasian birds. These are as follows, numbering continuously with his previous instalment. XIX. The forms of *Artamus leucorhynchos* (L.); *A. l. humei* subsp. n. from the South Andamans. XX, Some forms of *Hypothymis azurea* (Bodd); *H. a. symmixta* Alor Island, and *H. a. oberholseri*, Formosa, are described as new. XXI. The forms of

¹The Stimulation and the Inhibition of Ovulation in Birds and Mammals. By Wallace Craig. Jour. Animal Behavior. May-June, 1913, pp. 215-221.

²Wissenschaftliche Ergebnisse der Reise von Prof. Dr. G. Merzbacher im zentralen und östlichen Thian Schan, 1907-8. I. Vögel. von A. Laubmann. Abh. König. Bayern. Akad. Wissensch. Math.-phys. Klasse. XXVI Band 3. Abhandl. pp. 1-105. January 11, 1913.

³Ornithologische Miscellen aus dem Indo-Australischen Gebiet. Von Erwin Stresemann. Nov. Zool., vol. XX, pp. 289-324. June, 1913.

Die Vögel von Bali. Aus den Zoologischen Ergebnissen der II. Freiburger Molukken-Expedition. Nov. Zool., Vol. XX, pp. 325-387. June, 1913.

Eurystomus orientalis (L.), *E. o. gigas*, subsp. n. S. Andamans, *E. o. connectens* subsp. n. Moa Isl. XXII. The forms of *Amaurornis phœnicura* (Forster). XXIII. The forms of *Baza subcristata* (Gould), *B. s. pallida*, Kei Islands, and *B. s. megalia* Fergusson Island described as new. XXIV. The forms of *Cinnyris clementia* Less., *C. c. keiensis* subsp. n. Kei Islands. XXV. The forms of *Macropygia ruficeps* (Temm.), *M. r. nana* subsp. n. Kina Balu, Borneo. XXVI. The forms of *Alcedo ispida* in eastern and southern Asia and the Indo-Australasian Archipelago, *A. i. pelagica* subsp. n. St. Aignan, Isl. XXVII. The forms of *Thriponax javensis*, *T. j. confusus* subsp. n. Mt. Arayat, Luzon. XXVIII. The forms of *Centropus sinensis* (Steph.), *C. s. anonymus*, Tawi-tawi and *C. s. parroti*, Ceylon, are described as new.

The method adopted by Mr. Stresemann in his 'Miscellany' is to be commended as instead of merely describing a lot of new forms, he gives us the benefit of his study of all the related forms, presenting as it were a series of little monographs. In Another recent paper, he treats of the birds collected on the island of Bali on the second Freiburger Moluccan Expedition, additional species previously obtained on the island are also listed bringing the total to 149. The following are described as new: *Hemiprocne longipennis harterti*, *Surniculus lugubris brachyurus*, *Phœnicophaeus curvirostris deningeri*, *Phylloscopus borealis examinandus*, *Pachycephala grisola secedens*, *Criniger gularis balicus*, *Oreoosterops javanica elongata*, *Aplonis panayensis gusti* and *Aplonis panayensis leptorrhynchus* are described as new. There is also a valuable discussion of the plumage changes of *Centropus*.

At the close of this paper the author presents some zoogeographical conclusions regarding the relationship of the avifauna of Bali, Lombok, Java, Sumatra and Sumbawa which are of much interest. In an effort to meet the problem that confronts all students of geographic distribution — i. e. the relative value to be given species and subspecies in contrasting faunas — he differentiates between species which are broken up into closely related geographic races and well marked species which are not. The latter he terms 'Altform,' while the races of the complex species ('Art') he terms 'Jungformen.' This is a novel terminology but it draws attention to a matter of no little importance, especially in view of the enormous multiplication of subspecies which is now taking place.— W. S.

Menegaux on Ostrich Farming.¹— In this valuable paper one can find conveniently arranged, information on practically any phase of the subject of Ostrich rearing or the Ostrich plume business. The several geographic races of the bird are first described; then the structure of the plume and its development, and the variation in the feathers on different parts of the body are discussed. Chapter three deals with a history of the use of

¹ L'Élevage de L'Autruche, Récolte et Commerce des Plumes par A. Menegaux. Bibliothèque d'Agriculture Coloniale, pp. 1-156. Paris. 1913.

Ostrich plumes, and the commercial terminology and points used in valuing plumes. Chapter four considers the methods of procuring the plumes from the birds and other chapters relate to the commerce in Ostrich plumes, the domestication and care of the birds, and the extension of Ostrich farming. When we learn that in 1911 over 800,000 pounds of Ostrich plumes were exported from Cape Colony, valued at about ten million dollars, and that Ostrich raising is now going on in Transvaal, Australia, Algeria, Tunis, Soudan, Madagascar, Egypt and the United States, we begin to realize the magnitude of this business, and more than ever the absolute lack of necessity for tolerating in any way, shape or form the traffic in wild bird plumage. M. Menegaux has furnished us with a valuable work of reference which can be read with profit by all interested in the feather trade, either commercially or in its relation to bird protection—W. S.

Dubois' List of the Birds of Belgium.¹— Dr. Dubois prepared in 1885 a list of Belgian birds of which this is a 'new edition.' Eight names in the old list are cancelled and 25 species added during the twenty-seven years that have intervened making a total of 353. In comparing the avifauna of Belgium with that of any of the United States it may be of interest to state that Dr. Dubois finds that 70 species are resident, 57 summer residents, 39 winter visitants, 49 regular transients and 123 irregular or accidental. To these he adds as a separate category, 15 climatic varieties — surely a severe reflection upon the 'subspecies.' Dr. Dubois is very conservative in matters of nomenclature adhering to the twelfth edition of Linnæus, and rejecting tautonomy and trinomials, his 15 climatic varieties being designated by the old-fashioned " var."— W. S.

McAtee on the Relation of Birds to Grain Aphides.² — Mr. McAtee presents an elaborate report of a week's study of birds in connection with an outbreak of Grain Aphides near Winston Salem, N. C. Of the species present which fed upon the Aphides the following were the most important and in the order named, Field Sparrow, Goldfinch, Chipping Sparrow, Savannah Sparrow, Song Sparrow, Vesper Sparrow, and Snowbird. By estimating the number of birds present on the area of 100 acres which was under observation and the average number of Aphides found in the stomachs examined, Mr. McAtee concludes that these birds devoured about a million aphides a day, while migrants passing through at the time consumed as many more. It is interesting to see that all the species cited above are Fringillidæ, birds not usually credited with this sort of diet.— W. S.

Beal on Our Meadowlarks in Relation to Agriculture.³ — The distribution and economic status of *Sturnella magna* and *S. neglecta* are here

¹ Nouvelle Revue des Oiseaux Observés en Belgique, par Le Dr. Alph. Dubois. Mem. Soc. Zool. France. Tom. XXV, 1912, pp. 162-209.

² Relation of Birds to Grain Aphides. By W. L. McAtee. Year book U. S. Dept. of Agriculture for 1912. pp. 397-404, 3 figs.

³ Our Meadowlarks in Relation to Agriculture. By L. Beal. Yearbook U. S. Dept. of Agriculture, 1912. pp. 279-284.

summarized on the basis of data and stomach material in possession of the Biological Survey. Five-sixths of the animal food of these birds proves to consist of beetles, caterpillars and grasshoppers which far more than counterbalances the occasional and usually local consumption of grain, peas, etc.—W. S.

Economic Ornithology in recent Entomological Publications.—

The output of publications of all branches of the Department of Agriculture has been abnormally small during the present calendar year. Hence we find that only two of those of the Bureau of Entomology contain noteworthy mention of the bird enemies of insect pests. The fruit tree leaf-roller (*Archips argyrospila*) has caused considerable loss to fruit growers in Colorado, New Mexico, and New York. Mr. John B. Gill, the author of the bulletin on this pest states¹ that several species of birds have been observed feeding on the larvæ. These birds are the Bluebird, Western Robin, Catbird, Redwinged Blackbird, Orchard Oriole, Kingbird, Phœbe and the English Sparrow.

In a Farmers' Bulletin² on the common white grubs, larvæ of May beetles, and well known serious pests, Mr. John J. Davis gives birds first place among the natural enemies. The Biological Survey has found adults or larvæ of May beetles in the stomachs of more than 60 species of birds, a fact mentioned by Mr. Davis. Some of this author's original testimony is as follows:

"Probably the most important of these enemies are the birds, especially crows and crow blackbirds. Fields of timothy sod have been literally overturned by crows in their search for grubs, and in some fields the grubs were almost exterminated by them. Crows have often been observed following the plow in infested fields, eagerly picking up every grub that was unearthed. Mr. Henry Holzinger, of Lancaster, Wis., said that Crow Blackbirds followed the plow in great numbers where he was turning over a sod field in the spring of 1912. In one instance he watched a single blackbird eat many grubs, apparently its full capacity, and then gather as many as it could hold in its beak and fly away. In this case the bird destroyed in all 20 grubs in about 1 or 2 minutes. This habit of eating a large number of grubs and then flying away with its beak full was reported as a common occurrence with the blackbird. Mr. Fred Nelson, of Tabor, S. Dak., stated that his attention was directed to the unusual abundance of grubs in his field in the fall of 1911 by the blackbirds which came in flocks and followed him as he plowed. He soon learned that they were gathering grubs. After picking up several grubs each bird would fly back to the trees a short distance away and soon return. Thus there was a continuous flight from the trees to the ground and from the ground to the trees. Besides crows and blackbirds practically all of our common birds feed on white grubs or their adult forms, the May beetles." — W. L. M.

¹ Bulletin 116, Part V, U. S. Bureau of Entomology, March 12, 1913, p. 102.

² No. 543, U. S. Department of Agriculture, July 18, 1913.

Collinge's 'The Food of Some British Wild Birds.'¹—With the subtitle "A study in economic ornithology" and the limiting word 'some' in the main caption, it would appear that this little book deserved to escape censure because it does not absolutely settle the economic status of British birds. But it has nevertheless been rather pointedly criticised² evidently by someone with a bias in favor of uniform protection of all birds. A few words of truth uttered by Professor Collinge about certain injurious species, apparently are all this critic was able to see in the book and his prejudice is such that these could not be endured. This censorious reviewer states "it cannot be said that his (Collinge's) book greatly advances knowledge on this debated subject."

This statement, which serves chiefly to manifest the ignorance of this reviewer, is not only untrue but slanderous. Professor Collinge's book reports on the original examination of more than 3,000 stomachs of British birds, and is therefore by far the largest single contribution to its subject thus far made. The facts that the author includes digests of the researches of other works and gives a comprehensive bibliography are also held up against him by the afore-mentioned censor. The work has simply been done in modern and excellent style, and these inclusions make it immensely more valuable to all really interested in its subject matter.

Professor Collinge's book includes besides 4 general introductory and 3 concluding chapters, detailed reports on the food of 29 species of birds, besides chapters on "Birds as destroyers and distributors of weed seeds" and "Birds in relation to forestry."

The treatment by species includes an abstract of previously published evidence, tabulation of contents of stomachs examined, field observations by the writer, notes on the food of nestlings (when studied), examination of feces (when made) and conclusions. The conclusion is preponderately favorable to 18 species and more or less unfavorable to 11. Professor Collinge elaborates upon and reiterates his previously expressed opinion as to the lack of beneficial influence in the case of seed-eating birds. He states that birds on the whole are praiseworthy in their relations to forests. All in all this is the best handbook of the food of British Birds in existence and should be in the hands of everyone who desires reliable information on economic ornithology in this particular field.—W. L. M.

Bigglestone on Nesting Behavior of the Yellow Warbler.³—This paper is based upon a continuous study of a nest of young Yellow Warblers from the time of the hatching of the eggs, and irregular earlier observations, the observer occupying a blind situated close to the nest. With the co-operation of eleven assistants it was possible to record the actions of parents

¹ London 1913, 109 pp.

² Bird Notes and News, Vol. V, No. 6, June, 1913, pp. 93-94.

³ A study of the Nesting Behavior of the Yellow Warbler (*Dendroica aestiva aestiva*.) By Harry C. Bigglestone. Wilson Bulletin, Vol. XXV, No. 2, June, 1913, pp. 49-67

and young on each day, from the beginning of feeding about 4.30 A. M. to its cessation at about 8 P. M. without interruption, aggregating 144 hours and 53 minutes. Such cooperation renders studies of this sort much less irksome. During this time the parents fed the young 2373 times and a table shows roughly the different sorts of food that were provided. There was no feeding by regurgitation. The egg shells were devoured by the parents as were the excreta during the earlier part of the nestling period. Later they were carried away. The female did all the brooding and both birds had a stereotyped method of approaching the nest. The incubation period was eleven days.

This paper will take its place with a number of similar studies that have appeared in recent years and which we trust may increase in number until all of our common species have been similarly investigated. A comparative study of such records will eventually yield most valuable generalizations.—W. S.

Stone on Venezuelan Birds.¹—This paper treats of the birds secured by the Francis E. Bond Expedition of 1911, in the Paria Peninsula and the Orinoco delta, all the collections there secured having been presented by Mr. Bond to the Academy of Natural Sciences of Philadelphia. After a summary of the movements of the expedition and some comments on the faunistic relationship of certain of the species found at Cariaquito on the Paria Peninsula, the paper gives an annotated list of the one hundred and seventy-three species collected. As stated by the author "it is not surprising that no new forms were obtained. . . in a region so long familiar to bird collectors as the Orinoco delta," although the collection, which comprises five hundred and four skins, accompanied by full data, is of considerable value, "in view of the lack of definite localities in the case of early collections made in the Orinoco region." The two regions examined are quite different in character, forty-eight species having been taken at Cariaquito which were not secured in the delta country, although the author does not consider the collection "sufficiently comprehensive to warrant any general deductions on distribution." Field notes on the coloration of the tarsi, irides and other soft parts, made by Mr. Thomas S. Gillin who prepared the specimens, and notes on distribution and abundance supplied by Mr. Stewardson Brown, who was also a member of the expedition, add value to the paper.—J. A. G. R.

Abstract of the Proceedings of the Linnæan Society of New York.²
—The Abstracts which cover the first 56 pages are full of bird records of

¹ On a Collection of Birds obtained by the Francis E. Bond Expedition in the Orinoco Delta and Paria Peninsula, Venezuela. By Witmer Stone. Proc. Acad. Nat. Sci. Phila., 1913, pp. 189-212. Issued July 14, 1913.

² Abstract of the Proceedings of the Linnæan Society of New York for the years ending March 10, 1908; March 9, 1909; March 8, 1910; and March 14, 1911. Nos. 20-23, February 8, 1913, pp. 1-122, pll. I-XIV.

local interest, while two of the three papers published in full treat of birds. These are both by P. B. Philipp.—‘Bird’s-nesting in the Magdalen Islands,’ and ‘The Bird Colonies of Pamlico Sound.’ Both are well illustrated by photographic reproductions and are accompanied by annotated lists respectively of 55 and 12 species with detailed accounts of the habits, abundance and distribution of the birds, and interesting incidents of the trips.

The society seems to be active and prosperous and the present creditable publication is the most pretentious of its series of sixteen issues.—W. S.

The Ornithological Journals.

Bird-Lore.¹ Vol. XV. No. 4. July–August, 1913.

The “Old Man.” A Maine Coast Bird Study. By Frank A. Brown.—Herring Gulls and Eider Ducks on Old Man Island, Machias Bay.

Five Little Waxwings and How They Grew. By George G. Phillips.—One developed the wax tips to the secondaries in the juvenal plumage.

The Woodcock and Its Nest. By Francis M. Root.—With Photograph.

The Carolina Wren in Beverly, Mass. By Viola E. Crittenden.

Tragedies of Sandpipers’ Nests. By Paul E. Gray.

The Massachusetts Audubon Society’s Bird Lists.—Four lists of over 100 species each seen during the year. Competitive lists of any kind are always in danger of encouraging careless identification. The desire to add another species leads almost everyone to unconsciously err on the side of over-confidence.

Migration of N. A. Sparrows. By W. W. Cooke.—*Amphispiza bicolor* and *nevadensis* and *Melospiza lincolni* and *georgiana* are treated. W. De W. Miller describes the plumages, with a color plate by Fierst.

The Audubon Society Leaflets consist of the Brown Thrasher by T. G. Pearson and the Tufted Puffin by W. L. Dawson.

The Condor.² Vol. XV. No. 3, May–June, 1913.

A Study of the Nesting of the Marsh Hawk. By A. A. Saunders.—Illustrated.

The Wild Turkeys of Colorado. By W. W. Cooke.—Shows that *Meleagris gallopavo merriami* is apparently the only form that occurs in the state.

The Rocky Mountain Pine Grosbeak in Utah. By E. and A. O. Treganza.

Notes on Some Mesa County, Colorado Birds. By E. R. Warren.

Some Further Notes from the Tahoe Region. By M. S. Ray.

Notes from Buena Vista Lake and Fort Tejon. By Chester Lamb and H. B. Howell.

¹ Organ of the Audubon Societies. Edited by F. M. Chapman. Published by D. Appleton & Co., Harrisburg, Pa.

² Edited for the Cooper Ornithological Club, by Joseph Grinnell. Published at the Condor Office, Hollywood, California.

Notes on Certain Kansas Birds. By Alex. Wetmore.
Some Notes on the Nesting of the Short-eared Owl. By A. A. Saunders.
Synopsis of the Recent Campaign for the Conservation of Wild Life in California. By W. P. Taylor.

The Condor. Vol. XV. No. 4. July-August, 1913.

A Nest of the Dusky Horned Lark. By C. H. Kennedy.

Sierra Storms and Birds. By F. S. Hanford.

An Introduction to the Study of the Eggs of the North American Limicola. By R. W. Shufeldt.—Five plates.

With the Band-tailed Pigeon in San Diego County. By L. M. Huey.

The All-Day Test at Santa Barbara. By W. L. Dawson.—108 species seen in a day.

The Wilson Bulletin.¹ Vol. XXV. No. 2. June, 1913.

A Study of the Nesting Behavior of the Yellow Warbler (*Dendroica aestiva aestiva*). By H. C. Bigglestone.—See p. 603.

Some Records of the Feeding of Nestlings. By Lynds Jones.—Observations during part of the nestling period on Field Sparrow, Song Sparrow and House Wren.

Preliminary List of the Birds of Northern Passaic County, N. J. By L. S. Kohler.—144 species listed.

The Extermination of the Wild Turkey in Clayton County, Iowa. By Althea R. Sherman.—An interesting historical compilation.

Notes on the Sage Hen. By S. S. Visher.

The Oölogist.² Vol. XXX. No. 7. July 15, 1913.

Winter Birds of Egypt. By F. T. Pember.—Observations during six weeks on the Nile.

The Oölogist. Vol. XXX. No. 8. August 15, 1913.

Several articles on bird life on the Isle of Pines. By A. C. Reed, with illustrations of nests, etc.

Breeding Warblers of Harvey's Lake, Luzerne Co., Pa. By Archie Benners.

The Ibis.³ X Series. Vol. I. No. 3. July, 1913.

On a small Collection of Birds from Henderson Island, South Pacific. By W. R. Ogilvie-Grant.—Colored plate of *Vini stephensi* (North).

The Birds of Hong Kong, Macao, and the West River or Si Kiang, in Southeastern China, with Special Reference to their Nidification and Seasonal Movements. Part III. By R. E. Vaughan and K. H. Jones.—Treats of the Pigeons, Gallinaceous and Water Birds, concluding the paper. In an appendix *Pericrocotus stanfordi* from southeastern China is described as new.

The Evolution of Adaptation in Parasitic Cuckoos' Eggs. By E. C.

¹ Edited for the Wilson Ornithological Club by Lynds Jones, Oberlin, Ohio.

² Edited and published by R. M. Barnes, Lacon., Ill.

³ Edited for the British Ornithologists' Union, by W. L. Sclater. Published by R. H. Porter, 7 Princess St., Cavendish Sq., W., London.

Stuart Baker.—After many years study of Asiatic parasitic Cuckoos the author claims that eggs of parasitic Cuckoos have undergone, or are undergoing, a process of adaptation, and that the majority of foster parents fail to recognize differences in size or shape between their eggs and that of the Cuckoo but do recognize differences in color. We cannot, however, regard the evidence of adaptation as conclusive. The theory would seem to necessitate the parasitism of one race or strain of Cuckoos upon one species of bird and another race upon a different species, and upon this point we have no evidence whatever.

On the Linnæan Names *Strix funerea* and *Anser erythropus*, and on the Species which should be Referred to them. By Einar Lönnberg.—The use of *funerea* for Tengmalm's Owl as adopted in the A. O. U. Check-List but rejected in the recent British List is upheld upon what seems to be satisfactory evidence, while *Anser erythropus*, is shown to refer to the Lesser White-fronted Goose.

A Reference List of the Birds of New Zealand. By Gregory M. Mathews and Tom Iredale (continued).—The following are described as new: *Herodias alba maoriana*, *Carbo carbo steadi*, *Circus approximans drummondii*, *Nesierax pottsii*, *Cyanoramphus auriceps macleani*, *Strigops habroptilus innominatus*, *S. h. parsonsi*, *Sauropatis sanctus forsteri*, *Acanthositta chloris granti*, *Myiomoira macrocephala marrineri*, *Rhipidura flabellifera kempii*, also the genera *Mesocarbo*, type *Carbo sulcirostris* Brandt; *Maorigerygone* type *Curruca igata* Quoy and Gaimard and *Nesomiro*, type *Miro traversi* Buller.

Proceedings at the Annual General Meeting of the B. O. U. 1913.—Col. R. G. Wardlaw-Ramsay was elected president and Mr. E. C. Stuart Baker Secretary and Treasurer.

Bulletin of the British Ornithologists' Club.¹ No. CLXXXVIII.
May 28, 1913.

Oreocinclia whiteheadi, Khagan Valley, India, is described as new by E. C. Stuart Baker, who also has some remarks on other species of the genus, while *Laniarius helenæ*, Sierra Leone, W. Africa is described as new by H. J. Kelsall. W. R. Ogilvie Grant has diagnoses of the following new forms from Yemen: *Turdus menachensis*, *Parisoma buryi*, *Ænanthe yemenensis*, *Accentor fagani*, *Pseudacanthis* (gen. nov.) *yemenensis*, *Poliospiza menachensis*, and *Cryptolopha umbrovirens yemenensis*; all of which were procured by G. W. Bury.

H. M. Wallis presents a list of birds observed in the Balkans.

Bulletin of the British Ornithologists' Club. No. CLXXXIX.
July 10, 1913.

The meeting here recorded which took place on June 11, marked the twenty-first anniversary of the club and it was fittingly celebrated by the

¹ Edited by W. R. Ogilvie-Grant. Published by Witherby & Co., 326 High Holborn, London.

presentation of a memorial to the chairman, Dr. P. L. Selater. Dr. Selater was however unable to attend and his death a few days later is announced at the end of the Bulletin.

A. F. R. Wollaston and C. B. Kloss, just returned from the mountains of New Guinea, gave an account of their journey and W. R. Ogilvie Grant described the following new species from their collection: *Rallicula klossi*, *Melospitta lugubris rostrata*, *Edolisoma utakwensis*, *Anthus wollastoni*, and *Pardigalla intermedia*.

Hon. Walter Rothschild remarked upon a recent trip to Algeria.

The following new forms are described. By Col. S. Clarke: *Stizorhina vulpina intermedia*, Victoria Nyanza Dist.; *Caprimulgus ludovicianus*, S. W. Abyssinia. By Major H. H. Harrington: *Suya crinigera cooki*, Upper Burma; *S. c. yunnanensis*, Yunnan; *Prinia inornata burmanica*, Upper Burma; *P. i. formosa*, Formosa. By W. R. Ogilvie Grant: *Rhynchotruthus percivali yemenensis*, Yemen.

Claude H. B. Grant proposes the generic name *Heteromirafra* as a substitute for *Heteronyx* preoccupied.

British Birds.¹ Vol. VII. No. 2. July, 1913.

The sense of smell in the Gray Lag-Goose. By Mary G. S. Best and Maud D. Haviland.—A tent was erected near the nest for photographic purposes. When the wind was from the nest the bird exhibited no fear, when the wind was from the tent toward the nest she at first refused to remain on the nest, showing every appearance of fright, and later when incubating showed great uneasiness when the wind was in this direction. No explanation for her action seems plausible except that she 'winded' the photographer.

Discovery of a Colony of Tree-Sparrows on Inistrahull Island, Co. Donegal, Ireland. By C. J. Patten.

British Birds. Vol. VII. No. 3. August, 1913.

The Late Philip Lutley Selater. By A. H. Evans.—With portrait.

The Sequence of Plumages of the Common Eider. By J. G. Millais.

British Birds. Vol. VII. No. 4. September, 1913.

On the Breeding-Season and Clutch of the Steganopodes (Cormorant, Shag and Gannet.) By Rev. F. R. C. Jourdain.

Notes on the Breeding Habits of the Common Eider. As observed in the Outer Hebrides. By Mary G. S. Best and Maud D. Haviland.

On Incubation. By Eric B. Dunlop.—Data are presented showing that when incubation begins with the laying of the first egg the discrepancy in size of the young when all are hatched — if the last eggs hatch — is such that the older, stronger birds, get the bulk of the food, and the youngest bird and sometimes the next older, perish from starvation. Observations on Boobies agree in the fact that while two eggs constitute a clutch only

¹ Edited by H. F. Witherby. Published by Witherby & Co., 326 High Holborn, London.

one young is reared. Early incubation is undoubtedly a protective habit and that it should eventually result in mortality is very remarkable.

British Birds. Vol. VII. No. 1. June, 1913.

The Eclipse-Plumage of the Capercaillie. By W. R. Ogilvie Grant.

The Case of the Land Rail. By N. F. Ticehurst.— Proposes an inquiry as to the cause of its scarcity in certain sections.

Recovery of Marked Birds.

The Avicultural Magazine.¹ Vol. IV. No. 8. June, 1913.

For Love of Science. By Arthur G. Butler.— A rather remarkable article upholding the traffic in live wild birds and even the feather trade; though as the well-known statements, of the dealers that Egrets are no longer killed for their plumes is taken as fact the writer may be excused for some of his remarks. The paper gives rise to much discussion in subsequent numbers of the journal.

The Capercaillie at Home. By Martin Cunningham.

The Lesser Egret. By Hubert D. Astley.— A strong protest against the wearing of Aigrettes, etc.

The Avicultural Magazine. Vol. IV. No. 9. July, 1913.

The Great Bustard. By A. Trevor-Battye — With remarkable photograph of a male bird 'in display.'

The Finding of a Treasure. By Reginald Phillipps.— Interesting account of the Hobby, *Falco subbuteo*.

The Avicultural Magazine. Vol. IV. No. 10. August, 1913.

A Day in a Hampshire Garden. By Philip Gosse.— Familiar English birds discussed.

Numerous articles on cage birds in all three numbers.

Bird Notes.² Vol. IV. No. 6. June, 1913.

Some Interesting Birds. By W. T. Page.— Excellent photographs of the Great Spotted Woodpecker.

British Owls. By F. Dawson Smith.— Photographic illustrations.

Bird Notes from Trieste to Bombay. By H. Whistler.— Photograph of Hemprich's Gull in flight.

Bird Notes. Vol. IV. No. 7. July, 1913.

Three Pytelæ. By W. T. Page.— Colored plate of *P. melba* and *P. afra*.

Some Interesting Birds. By W. T. Page.— Photographs of *Philemon argenteiceps* and *Calliste fastuosa*.

The Emu.³ Vol. XIII. Part 1. July, 1913.

On the Osteology of the Red Wattle Bird (*Anthochaera carunculata*). By R. W. Shufeldt.— Four plates.

¹ Edited for the Avicultural Society by Hubert D. Astley. Published by West, Newman & Co., 54 Hatton Garden, E. C. London.

² Journal of the Foreign Bird Club. Edited by Wesley T. Page.

³ Organ of the Royal Australasian Ornithologists' Union. Edited by A. J. Campbell and Charles Barrett, Melbourne, Australia. London Agents, Witherby & Co., 326 High Holborn.

The Eggs of *Gymnorhina* spp. By A. F. Bassett Hull — Colored plate.
Field Ornithology in South Australia. By S. A. White — An annotated list of 75 species with several views of the country. Capt. White submits, under protest, to the nomenclature of the new R. A. O. U. Check List and in a letter emphasizes his opposition to it.

Bird-Life of the Kow Plains (Victoria). By L. G. Chandler.— 101 species listed with notes and some excellent photographs of nests.

Field Notes on Some Rallinæ. By Miss J. A. Fletcher.

The Austral Avian Record.¹ Vol. I. No. 8. March 20, 1913.

New Subspecies of Birds of the Monte Bello Islands, N. W. Australia. By P. D. Montague.— *Eremiornis carteri assimilis* and *Anthus australis montebelli*.

Additional Species Described by Gould from Norfolk, Lord Howe, and Philip Islands. By Witmer Stone and Gregory M. Mathews.

The Genus-name *Meliphaga*. By Gregory M. Mathews.— The type was first properly designated by Gray, 1840, as *M. chrysolis*. The name therefore takes the place of *Ptilotis* of most authors while *Meliphaga* auct. nec. Lewin becomes *Zanthoniza* Swainson.

Additions and Corrections to My Reference List. By Gregory M. Mathews.— 21 new races proposed.

New Geneva. By Gregory M. Mathews.— 10 new genera proposed.

The Austral Avian Record. Vol. II. No. 1. August 2, 1913.

The Coloration of the Palate and Pharynx of Australian Birds. By J. Burton Cleland.

Additions and Corrections to My Reference List. By Gregory M. Mathews.— 10 new forms.

Mattingleya inornata Ramsay. By Gregory M. Mathews.

New Genera and Species. By Gregory M. Mathews.— 3 genera, one species.

On Some Interesting [New Zealand] Birds in the Vienna Museum. By Tom Iredale.— *Gallirallus hectori ruscheki* subsp. nov. and *Hemipuffinus* gen. nov., type *Puffinus carneiceps* Gould.

Ardea² [In Dutch] Vol. II. No. 2. June, 1913.

Abnormal Coloration. By A. E. H. Swaen.— With list of albinos.

Ornithological Investigations in Steil in Omstreken. By P. C. Riotte.— Annotated list of 55 species.

Ornithological Observations in Netherlands. By E. D. Van Oort.

Revue Francaise d'Ornithologie.³ Vol. V. No. 50. June, 1913.

On the Classification of Birds. By A. Dubois.— Dr. Dubois' System is by no means a modern one. He divides the Aves into three subclasses,

¹ Edited by Gregory M. Mathews. Published by Witherby & Co., 326 High Holborn, London, W. C.

² Edited for the Netherlands Ornithological Society by L. F. De Beaufort, A. A. Van Pelt Lechner and E. D. Van Oort. Published by E. J. Brill, Leiden.

³ Edited by A. Menegaux, 55 Rue de Buffon, Paris.

Ratitæ, Ptilopædes, and Gymnopædes, the last two based on the condition of the young at hatching. In the arrangement of orders the Parrots are put at the head of the system separated from the Scansores, etc., by the whole Passerine series. The Cormorants are allowed to stand with the other Steganopodes in the '*Ptilopædes*' although the young are anything but downy, and on the other hand the *Caprimulgidæ* with downy young hardly agree with the '*Gymnopædes*.'

Need of a New Catalogue of French Birds According to a Modern Classification. By Dr. Besaucèle.

For the Formation of a 'Committee on Migration' in France. By J. Delamain.

On *Aquila nœvia*. By Gabriel Etoc.

Revue Française d'Ornithologie. Vol. V. No. 51. July, 1913.

Study of a Collection of Birds Obtained by M. Albert Pichon in Western Yunnan. By A. Menegaux and R. Didier.

Regarding the Buzzard. By R. Didier.—Food Habits.

Abnormal Eggs. By A. Legros.

On *Procellaria glacialis*. By N. Seguin-Jard.

Notes on the Spring Migration of 1913. By J. Delamain.

Ornithological Notes in Paris. By R. Babin.—*Columba palumbus* in the public gardens.

The Truth about the Birds of Prey. By F. Daguin.

Revue Française d'Ornithologie. Vol. V. No. 52-53. August-September, 1913.

The Ostrich in French West Africa. By G. Bouet.

Migration during 1912 and early 1913. By M. P. Petitclerc.—In several parts of France.

Egret Hunting in South America. By E. R. Wagner.

Ornithological Observations at Setif, Algeria 1895-1900. By A. L. Charriere.

Several local lists.

Journal für Ornithologie.¹ Vol. 61. Part 3. July, 1913.

On Nesting Data and Egg-Measurements of the Owls of the Western Palæarctic Region. By Forstmeister Wendlandt.

A Contribution to our knowledge of the Ornis of French Guinea. By Adalbert Klaptocz.—Annotated list of 130 species collected at Mamou and Dabola. September, 1911-January, 1912.

A Contribution to our Knowledge of the Bird Life of the Eastern Erz Mountains. By Richard Heyder.

On the Distribution of the Birds of Lower Amazonia. By E. Sneathage.

Oological Notes from German East Africa. By Ludwig Schuster.

Journal für Ornithologie. Special Number I. 1913 [July].

¹ Edited for the German Ornithological Society by Dr. A. Reichenow. L. A. Kittler, Leipzig, Agent.

Fourth Annual Report on Bird Observations at the Imperial Biological Station at Heligoland. By Hugo Weigold.—An elaborate and interesting contribution to our knowledge of bird migration. Four maps show the movements of certain Gulls along the coasts of Europe.

Ornithologische Monatsberichte.¹ Vol. 21, No. 6. June, 1913.

Ornithological Notes in Holland 1911–1912. By Baron R. Snouchaert van Schauburg.

On Bird-Speech. By Richard Biedermann Imhoof.

On a New Raven from Baluchistan. By A. Laubmann. *Corvus splendens zugmayeri* subsp. nov.

Some Remarks on *Anser anser*. By W. Grafsmann.

Ornithologische Monatsberichte. Vol. 21. No. 7–8. July–August, 1913.

Remarks on the Bird Life of the European Forests at Different Latitudes. By Fritz Braun.

Jaegers on the Rhine. By Dr. le Roi.

Bee-eating Birds. By J. Gengler.

On the Biology of Some Strand Birds. By W. Hagen.

Northern Rarities at Lubeck. By W. Hagen.

Some Observations on *Carpodacus erythrinus* (Pall.). By R. Zimmermann.

On the Swimming of Dippers. By R. Fenk.

Two Days Among the Birds of Jericho. By Ernst Schmitz.

The Wintering of *Parus atricapillus borealis* in Finland. By H. Grote and H. B. Loudon.

New Forms from Spain and Portugal. By H. Weigold. *Saxicola ananthe nivea*, *Alauda arvensis sierræ* and *Alauda arvensis taiti*.

Ornithologische Monatsschrift.² Vol. 38. No. 5. May, 1913.

Ornithology in Croatia, 1910. By E. Rössler.

Totanus hypoleucus, *T. ochropus* and *Rallus aquaticus* as German Winter Birds. By O. Brauns.

Ornithologische Monatsschrift. Vol. 38. No. 6. June, 1913.

Fifth Yearly Report of the Experimental and Model Station for Bird Protection. By Hans Freiherr von Berlepsch.

Ornithologische Monatsschrift. Vol. 38. No. 7. July, 1913.

On the Bird Rocks of the Faroes. By Carl Küchler.

Revista Italiana de Ornitologia [In Italian].³ Vol. II. No. 3.

The Various Forms of Shrikes in Italy. By T. Salvadori.

Systematic Position of *Laniellus leucogrammicus*. By T. Salvadori.

¹ Edited by Dr. A. Reichenow. R. Friedländer and Son, Berlin N. W. 6, Karlsh. 11. Agents.

² Organ of the German Society for the Protection of Birds. Edited by Dr. C. R. Henniecke and Dr. O. Taschenberg. Agent Max Kretschmann, Creutz'sche Verlagsbuchhandlung in Magdeburg.

³ Edited by Ettore Arrégoni Degli Oddi. Published by Stabelimento, Poligrafico Emiliano, Piazza Calderini 6, Bologna, Italy.

Somateria mollissima in Italy. By E. Balducci.

On *Caccabis labatei*. By G. Martorelli.

An Apparently New Form of *Gennæus*. By A. Ghigi.—*Gennæus fockelmanni* n. sp.

Ornithological Articles in Other Journals.¹

Mitchell, Dr. P. C. On the Anatomy of *Balaeniceps rex*. (Abst. Proc. Zool. Soc. London, No. 123. June 3, 1913.)—Many characters in common with *Scopus*, most of which occur also in the Storks. *Balaeniceps* seems best placed in a group by itself equivalent to the Storks and Herons.

Patten, C. J. The Diurnal Migrations of Certain Birds Observed at the Tuskar Rock [Ireland]. (The Zoologist, June 16, 1913.)

Stubbs, F. J. The Velocities of Migratory Birds. (The Zoologist, July 15, 1913.)—Considers that birds probably do not fly in 'the teeth of the wind,' but take advantage of air currents for long flights.

Ingram, C. Stray Notes on the Birds of Trinidad and Tobago, British West Indies. (The Zoologist, July 15, 1913.)

Mudge, G. P. Some Phenomena of Species Hybridization among Pheasants. (The Zoologist, July 15, 1913.)—Comparison of plumage of *Euplocamus nycthemerus* × *E. swinhoii* with parents.

Selous, E. A Diary of Ornithological Observation Made in Iceland During June and July, 1912. (The Zoologist, August 15, 1913.)

Clarke, W. Eagle. Two Birds New to the Scottish Fauna. (The Scottish Naturalist, July, 1913.)—*Motacilla flava beema*, *Sterna anglica*.

Anderson, P. The Birds of the Island of Tiree. (The Scottish Naturalist, July, 1913.)

DuBois, A. Review of the Ritite Birds. (Bull. Soc. Zool. de France XXXVII, p. 300; XXXVIII, p. 104, 1913.)—A List with synonyms and generic keys.

DuBois, A. Birds and Insects from the Economic Point of View and The Protection of Birds. (Bull. Soc. Zool. de France, XXXVIII, 1913.)

Stanwood, C. J. The Hermit Thrush at Home. (Nature and Culture May, 1913.)—A careful study of a nest and young. The incubation period is determined as 12 days.

Swenk, M. H. and Zimmer, J. T. Some Notes on the Summer Birds of Southwestern Nebraska. (Proc. Nebraska Ornith. Union, V, pt. 4, May 1, 1912.)—Annotated list of 53 species.

¹ Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligation to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Holland, R. P. The Gun for Spring Shooting. Varied Experiences and Some Success in Hunting Ducks and Geese with a Camera. (Out Door World and Recreation, July, 1913.)

Editorial. Shooting Up An Egret Rookery.—Illustrated account of the latest Florida outrage. (Out Door World and Recreation, 1913.)

Bailey, B. H. The Occurrence of Melanism in the Broad-winged Hawk; A Remarkable Flight of Broad-winged Hawks; and Notes on the Food of the Black-crowned Night Heron in Captivity. (Proc. Iowa Acad. Sci., XIX, 1912.)

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CORRESPONDENCE.

Naturalists and 'Concealing Coloration.'

EDITOR OF 'THE AUK.'

Dear Sir:—In a letter just received from Mr. John T. Coolidge 3rd. now in British East Africa, he writes: "What you say about an object of uniform color against the sky seen from below has been impressed upon me lately. I find that in hiding to ambush game for moving pictures, it is essential to have an opaque background, otherwise you are sure to be detected, silhouetted against the sky. I am going to pin white strips of paper on my shoulders and helmet, when an opaque background is not obtainable.

I am doubtful about getting a Chapman's Zebra, but shall not fail to bring you a Grant's Zebra. Individuals vary tremendously but many Grant's Zebra have jet black stripes on a clean white ground. Rarely they have a faint supplementary stripe between the others and sometimes the stripes are brown on a yellow-cream ground, but I will look for a contrasty one. I have moving pictures of Zebra coming to water which show the extreme fear they have of approaching the bushy and reedy water holes, even by day. In the rains, they can drink out of pans in the open, but all permanent water is surrounded by bush or reeds, or usually both. * * *

This should remind the reader of the obviousness of what I have repeatedly tried to show to naturalists, that the laws of illumination and vision are the same the world over, and that the naturalists who have opposed the progress of this great biological discovery merely need to study these laws.

This well known variation of zebras' colors from black and white to brown and yellow is absolutely parallel to the variations of form and other characters, equally well known in almost all species. All the cases are more or less obviously traceable to corresponding variation in the animals' circumstances.

In the Zebra's case, for instance, pure black and white are a little the best costume where the sky, and particularly stocky (and therefore particularly opaque) reeds tend to be the animal's sole background. On the other hand, in a region where more translucent vegetation and less open sky are typical, so that the lightest note behind the zebra is apt to be mere lighted foliage oftener than sky, a brown and yellow zebra would often match a little closer than a black and white one.

Yours very truly,

ABBOTT H. THAYER.

Monadnock, N. H.

Sept. 11, 1913.

Migration and Periodic Accuracy.

EDITOR OF 'THE AUK.'

Dear Sir: — In Dr. John C. Phillips' highly interesting remarks on these topics (*Auk*, XXX, p. 202) he says "It would indeed be interesting if we could subject castrated birds to experimental conditions in order to test the strength of their migratory impulses, but this could hardly be accomplished."

It would be equally interesting if we could take species migrating northward for reproductive purposes, and subject them to a reversal of seasonal sequences, by introducing them into the southern hemisphere, and learn then what changes and variations of migratory impulses would follow.

Sometime ago the writer had occasion to make inquiries concerning the habits of introduced Cervidæ in New Zealand; the following letter (quoted only in relevant parts) from a well informed New Zealand Government Official came as a reply to these inquiries;

... "In reply to your question regarding the introduction of deer into New Zealand: — The first red deer presented comprised 12, which were the gift of the late Prince Consort to the Colony. These deer were bred in Windsor Forest. Six of them were shipped to Wellington and six to Canterbury in the year 1862, but three only were landed alive, one stag and two hinds. These were sent to Wellington and kept by the Government in a stable, and after the interest and curiosity of the inhabitants were satisfied, the three deer were put into a dray, and carted over the Tararua Mountains into the Wairarapa district where they were liberated, and from that trio there are now quite 12,000 deer in the vicinity. In addition to producing larger antlers than their progenitors in Scotland, they also increased very considerably in general bulk. Rutting occurs generally from about the 20th of March to the 14th of April. This is dependent very largely upon the weather. When the weather is cold, the rutting takes place early, but should it be very mild and warm it does not occur until about the end of March or first week in April. Calving occurs generally in October and November. The stags shed their antlers in November. The rutting, calving and shedding of antlers, as you will see, are exactly opposite to the time in which these processes occur in England. If you take the English dates and defer them for six months you get the same results as regards the red deer in New Zealand." . . .

It is highly probable that these facts concerning the definite reversal of time of rutting, etc., have already been published, yet if so, such publication has up to date escaped the writer's notice. The facts just quoted constitute a most striking exposition of the seasonal influence on biologic functions and nutritional processes of great magnitude and importance to the species in question. It is possible that parallel alterations in migration, including "periodic accuracy," ovulation, nesting, and incubation would

be found to result could one successfully transplant and keep track of birds of migratory species from the northern to the southern hemispheres, or vice versa. The writer's only excuse for calling attention in this ornithological publication to data bearing directly on mammals only, is that the data also bear indirectly on cognate processes in birds, and should be available for future investigators of migration, etc,

Very truly,

W. H. BERGTOLD.

Denver, Colo.

NOTES AND NEWS.

PHILIP LUTLEY SCLATER, D. Sc., F. R. S., one of the original Honorary Fellows of the American Ornithologists' Union, died on June 27, 1913, at the age of eighty-three years. Dr. Sclater was known throughout the scientific world as secretary of the Zoological Society of London, a post which he filled from 1859 to 1902; and as a founder of the British Ornithologists' Union, and editor of its journal 'The Ibis' from 1866 to 1912 with the exception of a period of 12 years. He was also chairman of the British Ornithologists' Club since its organization. His services to ornithology throughout his long and active life can scarcely be overestimated, especially in connection with neotropical bird life of which he made a specialty, and upon which he published a long series of papers culminating with the volumes of the British Museum Catalogue of Birds, dealing with the Tanagridæ, Icteridæ, Tyrannidæ, Dendrocolaptidæ, Formicariadæ and other characteristic neotropical families. Dr. Sclater's loss will be felt by ornithologists the world over, especially by the many who were fortunate enough either through personal contact or through correspondence to count him as a friend.

At the request of the president of the American Ornithologists' Union, Dr. Daniel Giraud Elliot will deliver a memorial address on Dr. Sclater at the annual meeting of the Union in November, which will be published in full in the January number of 'The Auk.'

THE American Museum's zoological explorations in South America, which, during the past two years, have produced such interesting results in the northern parts of that continent, now promise to be even more effectively prosecuted in southern South America, under the leadership of Colonel Theodore Roosevelt, who in December plans to enter Southern Brazil.

Mr. George K. Cherrie and Mr. Leo E. Miller, both tried members of former Museum expeditions, will accompany Colonel Roosevelt as field assistants.

In Ecuador, Mr. Richardson has had a successful season and a shipment of 1400 birds and mammals has just been received from him. These specimens were collected in part on the coast from the northern extension of the arid coastal zone of Peru, and give definite information of where this arid strip merges into the humid coastal region of northeastern Ecuador and western Colombia.

Mr. Richardson also collected in the luxuriant forests of the Subtropical Zone at an altitude of 6000 feet, in the Temperate Zone about Quito and the base of Pinchincha, and in the Paramo or Alpine Zone of Pinchincha and Chimborazo, working on the latter mountain up to an altitude of

16,000 feet. Here Mr. Richardson secured not only specimens but accessories for a Habitat Group designed to represent the bird-life of the upper life-zone of this extinct volcano.

From Peru, the Museum's available study material has received an exceptionally important addition in the collections made by R. H. Beck for Mr. F. F. Brewster and Dr. L. C. Sanford. A large shipment lately received from Mr. Beck is particularly rich in little-known marine forms collected well off the coast of Peru, and in a beautifully prepared series of water-fowl from Lake Junin, situated at an altitude of 13,000 feet in the Peruvian Andes, which includes the Andean Flamingo and many other species not heretofore represented in the Museum.

THE thirty-first stated meeting of the American Ornithologists' Union will be held at the American Museum of Natural History, New York City, November 11-13, 1913, with a business meeting of the Fellows on the evening of the 10th. The annual subscription dinner will be held at the Hotel Endicott, close to the museum, which will also be the headquarters for visiting members.

These annual gatherings bring together upwards of one hundred bird students from various parts of the country. The attractions offered by the sessions of the meeting, and by the institution at which they are held, and above all the stimulus of personal contact with other ornithologists, tend to bring back those who have once been fortunate enough to be present at one of these gatherings. There are however a great many members and associates of the Union who have never attended a meeting and upon these especially we would urge the importance of at once making plans to be present in New York on November 11. One of the greatest privileges of membership is the opportunity of attending these annual meetings and a large attendance creates a wider and deeper interest in ornithology and strengthens the organization of the A. O. U. which has done so much for bird study in America.

WE learn from 'The Ibis' of the safe return of Mr. A. F. R. Wollaston's New Guinea Expedition. The party consisted of Mr. Wollaston, Mr. C. B. Kloss, five Dyak collectors, seventy-four Dyak carriers and an escort of 130 men provided by the Dutch Government. They succeeded in reaching the snow line on Mt. Carstensz about the end of February, and sailed for home April 3.

The collections include 1300 skins of birds and some of the novelties have already been described by Mr. Ogilvie-Grant. The party found animal life very scarce above 6,000 ft. Some Pipit-like birds occurred about 9000 ft. and a Dove and a Thrush between 13000 and 14000 ft.

JUST one hundred years ago there occurred an event the effect of which, on the development of American ornithology, it is impossible to estimate. On August 23, 1813, there died in Philadelphia, Alexander Wilson, aged

forty-seven years and forty-eight days. At the time of his death he was engaged in preparing for publication the eighth volume of his 'American Ornithology.' This confining work during the heat of midsummer seems to have been too much for a constitution never robust, and he was unable to withstand an attack of sickness which might not under other circumstances have proved serious.

Wilson's premature death removed him from the scientific world, when he was known to but very few outside of his own city. He did not live to hear the great praise that his work received in the scientific centers of England and France, and apparently had reaped no financial profits from its publication.

One cannot but speculate upon what the effect would have been upon later ornithologists had Wilson been spared to round out the period of life normally allotted to man. We know that he had a work on American Mammals in mind and also a popular manual or handbook on American birds. What influence would the existence of such works have had upon the similar publications of Audubon and Nuttall? Indeed the presence in America of an ornithologist of the reputation that Wilson must surely have attained, would certainly have had a tremendous influence upon the whole career of Audubon, who as it was had the field practically to himself.

In the March and June numbers of 'Bird Notes and News' are some interesting articles on the prevention of bird mortality at light houses. The idea of saving the birds which, attracted by the light, are supposed to dash themselves against the masonry or glass of the lighthouses, originated with the distinguished Dutch naturalist, Prof. Jac. P. Thijssse. He advanced the theory that the majority of the migrants fascinated by the glare, or so bewildered by it that they lose their sense of direction, fly aimlessly round and round seeking a resting place, until they become exhausted, fall, and perish.

For three years past he has had installed at the Terschelling Lighthouse on the Frisian Islands, ladder like perches of wood or iron covered with cloth, attached to the roof and platform. On nights when conditions are favorable for attracting migrants to the light, the perches become crowded with resting birds "to the number of ten thousand" and when dawn approaches the whole company resume their flight. The mortality has been so reduced that at present it does not exceed a hundred birds during the whole migration period.

Similar experiments are now in progress at St. Catharine's Lighthouse on the English coast, being conducted by the Royal Society for the Protection of Birds with the hearty support of the Lighthouse Board. It has already been demonstrated both here and at Terschelling that the racks or perches must be placed actually in the glare of the light, as the birds will not alight in the dark area above or below.

It is encouraging to find what promises to be such a simple solution of this problem.

MESSRS. WITHERBY & Co., 326 High Holborn, London, announce the publication, by subscription, of a work entitled *The Gannet: a Bird with a History* by J. H. Gurney, F. Z. S., illustrated with colored plates, maps and drawings; 600 octavo pages. Price to subscribers before October 30, 25 shillings.

DULTZ & Co., 6 Landwehrstrasse, München, announce a reprint of the ornithological articles contributed by R. P. Lesson to the "Echo du Monde Savant." This is one of the rarest of publications and the importance of Lesson's contributions make reference to it imperative. The reprint will be under the editorship of Dr. A. Menegaux.

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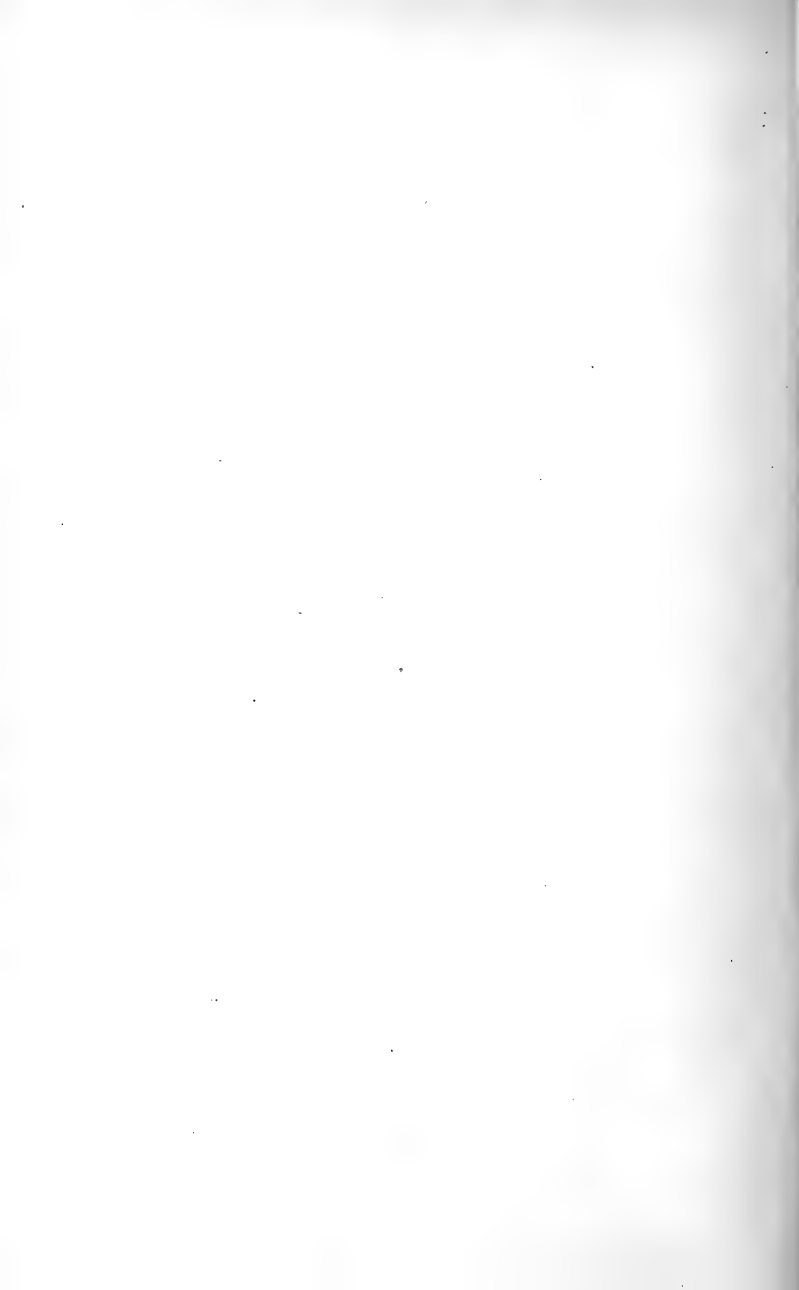
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ERRATA.

- Page 14, line 17, for *Habia* read *Zamelodia*.
 " 302, " 33, insert after 'Emu,' XII, Part 3, January, 1913.
 " 326, " 5, for 'county' read 'country.'
 " 340, " 1, " **Megascops** read **Otus**.
 " " " 29, " **pubescens** read **medianus**.
 " " " 35, " **Ceophlœus** read **Phlœotomus**.
 " 374, " 22, " **tzaectl** read **tzacatl**.
 " 348, " 34, " **Ampelis** read **Bombycilla**.
 " 353, " 6, " **Traglodytes** read **Troglodytes**.
 " 424, " 42, omit second **cærulea**.
 " 610, " 35, for *carneiceps* read *carneipes*.

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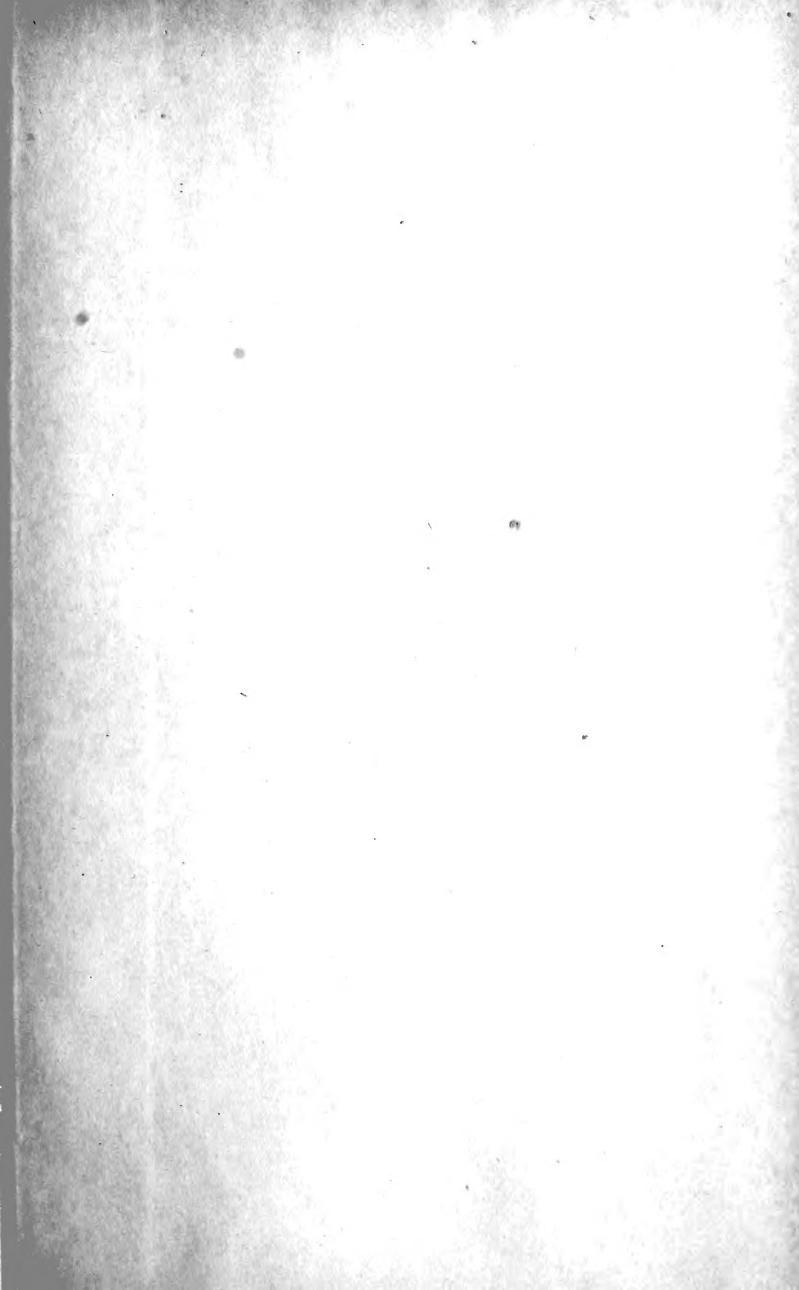
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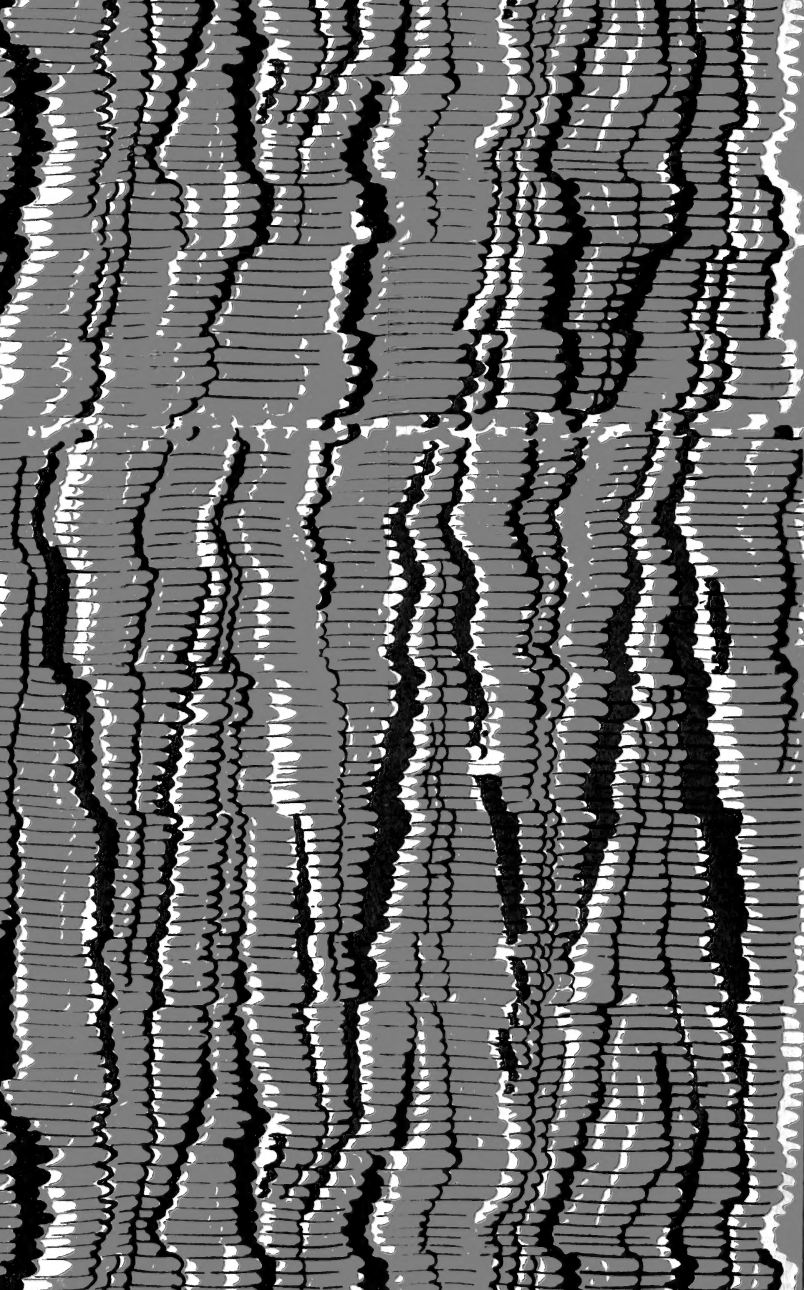
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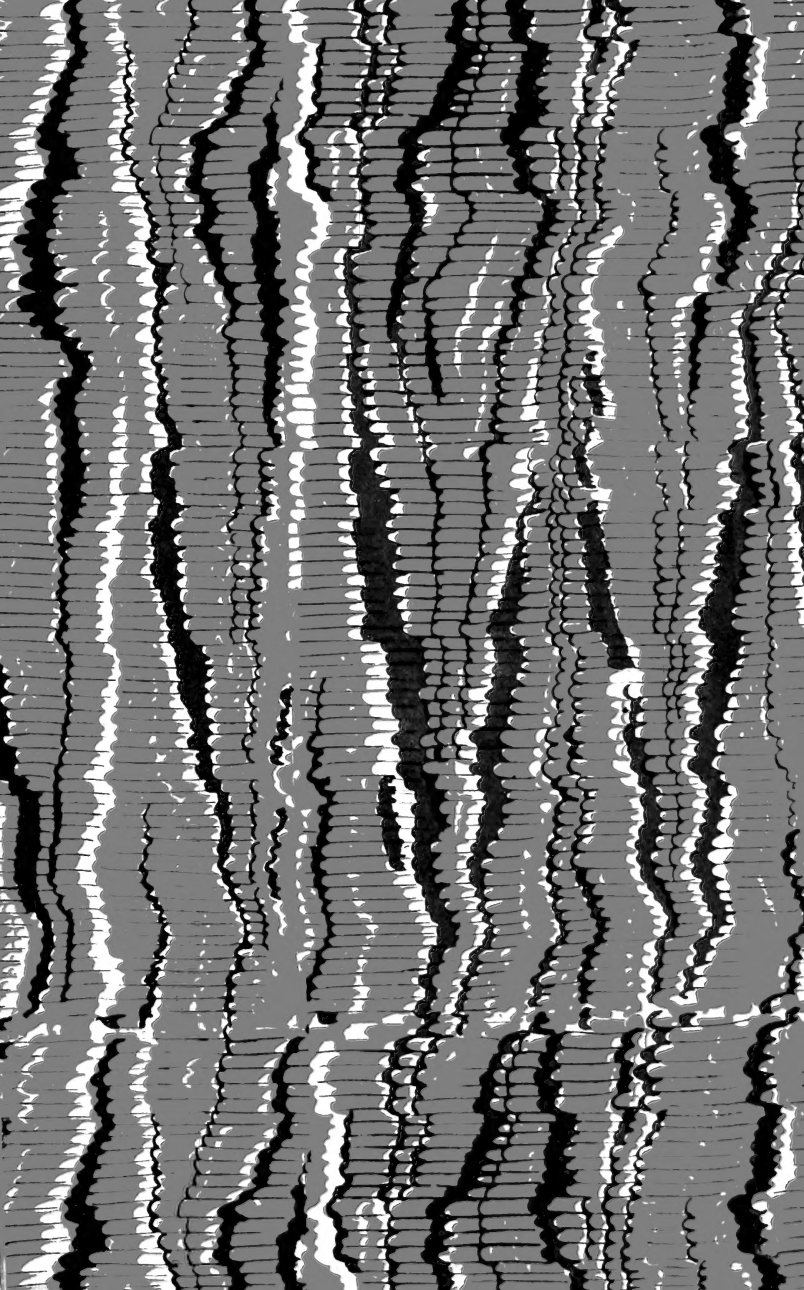
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