



OLD SERIES, }
VOL. XIX }

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB.

{ NEW SERIES,
VOL. XI }

The Auk

A Quarterly Journal of Ornithology

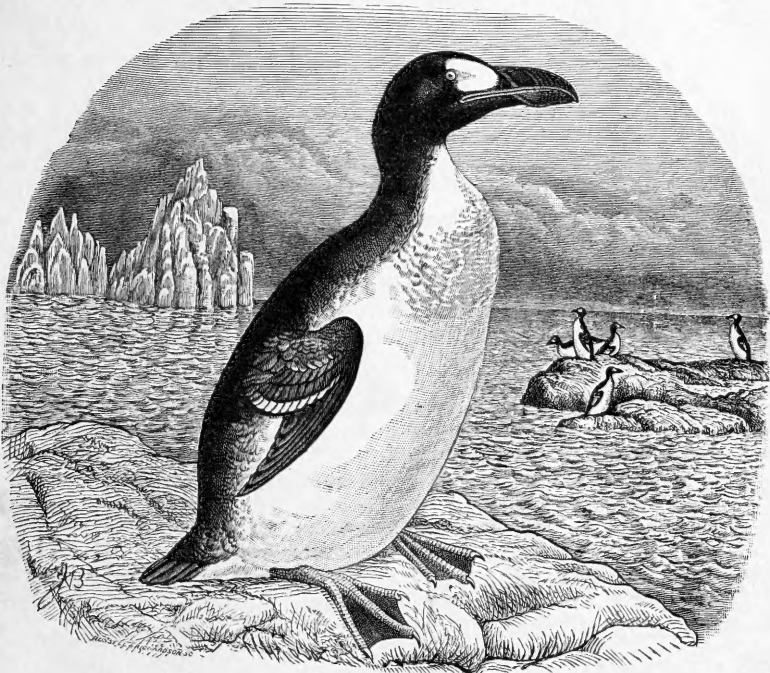
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VOLUME XI

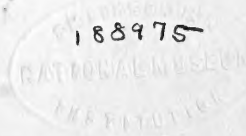
PUBLISHED FOR

The American Ornithologists' Union

NEW YORK

L. S. FOSTER

1894



МАТРОСКИНС
МУЗЕЙ ИСТОРИИ
И ПАМЯТИ

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REED, CHARLES K., Worcester, Mass.....	1890
REED, J. HARRIS, Beverly, N. J.....	1890
REISER, Rev. F., Marysville, Cala.....	1892
RENWICK, FRANK H., Seattle, Wash.....	1893
RHOADS, SAMUEL N., Haddonfield, N. J.....	1885
RICE, FRANK L., 47 S. Canal St., Chicago, Ills.....	1886
RICHARDS, JOHN BION, 8 Barnaby St., Fall River, Mass.....	1888
RICHARDSON, W. M., Am. Mus. Nat. Hist., New York City.....	1891
RICHMOND, CHARLES W., 1908 9th St., N. W., Washington, D. C.....	1888
RIDGWAY, JOHN L., U. S. Geol. Surv., Washington, D. C.....	1890
RIECKER, ERNST, 900 South 4th St., St. Louis, Mo.....	1888
RIKER, C. B., South Orange, N. J.....	1885
RIVES, Dr. WILLIAM C., 113 East 38th St., New York City.....	1885
ROBBINS, WILLIAM A., 178 Garfield Place, Brooklyn, N. Y.....	1888

ROBERTS, GEORGE W., West Chester, Pa.....	1891
ROBERTS, W. F., 1421 G St., N. W., Washington, D. C.....	1888
RODDY, Prof. H. JUSTIN, Millersville, Pa.....	1891
ROOSEVELT, Hon. THEODORE, Oyster Bay, Queens Co., N. Y.....	1888
ROTZELL, Dr. W. E., Narberth, Pa.....	1893
ROWLAND, THOMAS, 182 6th Ave., New York City.....	1890
ROWLEY, JOHN, JR., Am. Mus. Nat. Hist., New York City.....	1889
RUSSELL, GEORGE C., Meadville, Pa.....	1888
RUSSELL, ROY, Kokomo, Indiana.....	1891
SAGE, HENRY M., Albany, N. Y.....	1885
SARGENT, HARRY B., Niagara Falls, N. Y.....	1892
SCHALER, JOHN, Stamford, Conn.....	1893
SCHLEGEL, Miss MATILDE, East Aurora, N. Y.....	1889
SCHURR, THEODORE A., Pittsfield, Mass.....	1888
SCHWAB, Rev. L. H., 101 Lawrence St., New York City.....	1892
SCOTT, W. L., 74 Sparks St., Ottawa, Ontario.....	1883
SCROGGS, Dr. G. A., Beaver, Pa.....	1891
SHEARER, AMON R., Ames, Iowa.....	1893
SHEPPARD, EDWIN, Acad. Nat. Sci., Philadelphia, Pa.....	1892
SHERRATT, W. J., 263 North 2d St., Philadelphia, Pa.....	1891
SHORES, Dr. E. I., Soldiers' Home, Hampton, Va.....	1883
SHORT, ERNEST H., Chili, N. Y.....	1891
SHRYOCK, WILLIAM A., 823 N. Broad St., Philadelphia, Pa.....	1893
SLADE, JOHN A., 1134 Herkimer St., Brooklyn, N. Y.....	1888
SMALL, FREDERIC L., Provincetown, Mass.....	1891
SMITH, CLARENCE A., 30 W. Bijou St., Colorado Springs, Col.....	1889
SMITH, HORACE G., Jr., 2918 Lafayette St., Denver, Col.....	1888
SMITH, Dr. HUGH M., 1248 New Jersey Ave., Washington, D. C.....	1886
SMITH, JAMES E., East Killingly, Conn.....	1889
SMITH, LUTHER H., Box 132, Pittsburgh, Pa.....	1891
SMITH, S. SIDNEY, 59 Wall St., New York City.....	1888
SMYTH, Prof. ELLISON A., Jr., Va. Agr. and Mech. Coll., Blacksburg, Va.....	1892
SORNBORGER, JEWELL D., Cambridge, Mass.....	1888
SOUTHWICK, E. B., Arsenal Bldg., Central Park, New York City....	1888
SPELMAN, HENRY MUNSON, 62 Sparks St., Cambridge, Mass.....	1883
SPRAGUE, JOHN C., 38 Wall St., New York City.....	1891
STANTON, Prof. J. Y., Bates College, Lewiston, Me.....	1883
STEERE, Prof. J. B., Univ. of Mich., Ann Arbor, Mich.....	1890
STEPHENS, F., Witch Creek, San Diego Co., Cal.....	1883
STOEY, W. W., Harrisburg, Pa.....	1891
STONE, D. D., Lansing, N. Y.....	1891
STONE, Dr. W. H., Palmer, Mass.....	1893
STONEBURN, FRED. H., Harrisburg, Pa.....	1893
STREATOR, CLARK P., Garrettsville, O.....	1889
STRODE, Dr. W. S., Lewistown, Ill.....	1889
STRONG, REUBEN M., Oberlin, Ohio.....	1889

STUDER, JACOB H., P. O. Box 2417, New York City.....	1888
SURBER, THADDEUS, White Sulphur Springs, West Va.....	1890
SWALLOW, C. W., Willsburgh, Multuoma Co., Oregon.....	1890
SWINBURNE, JOHN, Guernsey, England.....	1887
TALBOT, D. H., Sioux City, Iowa.....	1885
TATLOCK, JOHN, Jr., Mutual Life Ins. Co., New York City.....	1887
TAYLOR, ALEXANDER O'DRISCOLL, 124 Bellevue Ave., Newport, R. I.	1888
TAYLOR, H., 63 Park Place, Bridgeport, Conn.....	1893
TAYLOR, TRUMAN R., 90 William St., Rochester, N. Y.....	1892
TEST, F. C., U. S. Nat. Mus., Washington, D. C.....	1892
THOMPSON, ERNEST E., 86 Howard St., Toronto, Ontario.....	1883
THOMPSON, FRANK J., Zoölogical Garden, Philadelphia, Pa.....	1885
THOMSON, Prof. GEORGE S., Boulder, Colo.....	1892
THORNE, Capt. PLATTE M., 22d Inf. U. S. A., 513 Broadway, Albany, N. Y.....	1885
THURBER, E. CARLETON, Alhambra, Cala.....	1886
TODD, LOUIS M., Calais, Me.....	1887
TODD, W. E. CLYDE, Dept. Agriculture, Washington, D. C.....	1890
TOPPAN, GEORGE L., 138 Jackson St., Chicago, Ill.....	1886
TORREY, BRADFORD, Wellesley Hills, Mass.....	1883
TORTAT, W. R. M., Atchison, Kansas.....	1890
TOWNSEND, CHARLES H., Fish Comm., Washington, D. C.....	1883
TREAT, WILLARD E., East Hartford, Conn.....	1885
TREICHLER, Dr. A. C., Elizabethtown, Pa.....	1891
TROMBLEY, JEROME, Petersburg, Mich.....	1885
TROTTER, Dr. SPENCER, Swarthmore College, Swarthmore, Pa.....	1888
TUTTLE, Dr. CARL, Berlin Heights, O.....	1890
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN DENBURG, JOHN, Los Gatos, Cala.....	1893
VELIE, Dr. J. W., St. Joseph, Mich.....	1886
VERRILL, ALPHEUS H., New Haven, Conn.....	1888
VILARO, Dr. JUAN, Havana Univ., Havana, Cuba.....	1888
VOORHEES, CLARK G., 59 East 75th St., New York City.....	1888
WAKEFIELD, JULIUS R., Dedham, Mass.....	1885
WALCOTT, ROBERT, 11 Waterhouse St., Cambridge, Mass.....	1893
WALKER, Dr. R. L., Mansfield Valley, Pa.....	1888
WARREN, Dr. B. H., West Chester, Pa.....	1885
WARREN, O. B., Palmer, Mich.....	1892
WEBSTER, FREDERIC S., 114 5th Ave., New York City.....	1886
WEBB, WALTER F., Geneva, N. Y.....	1891
WEST, LEWIS H., Roslyn, Queens Co., N. Y.....	1887
WEST, SAMUEL H., 76 Devoe St., Brooklyn, N. Y.....	1889
WHITE, FRANCIS BEACH, Cambridge, Mass.....	1891
WHITE, HARRY GORDON, 39 Union St., Taunton, Mass.....	1889
WHITE, STEWART E., Grand Rapids, Mich.....	1890
WHITNEY, Prof. E. R., Binghamton, N. Y.....	1891
WHOLEY, W. N., 204 Brady Ave., Baltimore, Md.....	1891

WICKHAM, H. H., Beaver, Pa.....	1890
WICKS, M. L., Jr., Los Angeles, Cala.....	1890
WILLIAMS, J. BICKERTON, 710 Sherbrooke St., Montreal, Can.....	1889
WILLIAMS, ROBERT S., Columbia Falls, Montana.....	1888
WILLIAMS, W. J. B., Holland Patent, N. Y.....	1893
WINTLE, ERNEST D., 11 Hospital St., Montreal, Can.....	1887
WOOD, A. H., Painted Post, N. Y.....	1887
WOOD, Mrs. JOSEPH, West Brookfield, Mass.....	1893
WOODMAN, EDMUND J., Harvard Univ., Cambridge, Mass.....	1890
WOODRUFF, LEWIS B., 14 East 68th St., New York City.....	1886
WOODS, WILLIAM J., State Bank Bld., Richmond, Va.....	1892
WORTHEN, CHARLES K., Warsaw, Ill.....	1891
WORTHINGTON, R. B., Dedham, Mass.....	1893
WORTHINGTON, WILLIS W., Shelter Island, Suffolk Co., N. Y.....	1889
WYE, SAMUEL A., Tacoma, Washington.....	1891
YORKE, Dr. F. HENRY, Hallock, Minn.....	1891
YOUNG, CURTIS CLAY, 63 Greene Ave., Brooklyn, N. Y.....	1891

DECEASED MEMBERS.

ACTIVE MEMBERS.

Date of Death.

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

HONORARY MEMBERS.

BURMEISTER, HERMANN.....	May 1, 1892
GURNEY, JOHN HENRY.....	April 20, 1890
KRAUS, FERDINAND.....	Sept. 15, 1890
PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SCHLEGEL, HERMANN	Jan. 17, 1884
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING MEMBERS.

BLAKISTON, THOMAS W.....	Oct. 15, 1891
BOGDANOW, MODEST N.....	March 4, 1888
HAAST, JULIUS VON.....	Aug. 15, 1887
HOMMEYER, E. F. VON.....	May 31, 1889

Deceased Members.

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MARSHALL, A. F.....	Oct. 11, 1887
PREJEVALSKI, N. M.....	Oct. 20, 1887
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888
SEVERTZOW, N.....	Feb. 8, 1885
STEVENSON, HENRY.....	Aug. 18, 1888

ASSOCIATE MEMBERS.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ATKINS, H. A.....	May 19, 1885
BECKHAM, CHARLES WICKLIFFE.....	June 8, 1888
BRESE, WILLIAM L.....	Dec. 7, 1889
CORNING, ERASTUS, JR.....	April 9, 1893
COE, W. W.....	April 26, 1885
ELLIOTT, S. LOWELL.....	Feb. 11, 1889
GOSS, BENJAMIN F.....	July 6, 1893
HOWLAND, JOHN SNOWDON.....	Sept. 19, 1885
KUMLIEN, THURE.....	Aug. 5, 1888
LINDEN, CHARLES.....	Feb. 3, 1888
MABBETT, GIDEON.....	Aug. 15, 1890
MINOT, HENRY DAVIS.....	Nov. 13, 1890
NORTHROP, JOHN I.....	June 26, 1891
PARK, AUSTIN F.....	Sept 22, 1893
RICHARDSON, JENNESS.....	June 24, 1893
SMALL, EDGAR A.....	April 24, 1884
VENNOR, H. G.....	June 8, 1884
WILLARD, SAMUEL WELLS.....	May 24, 1887
WOOD, WILLIAM.....	Aug. 9, 1885





Red. by Kesteven Hill.

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HYBRID, CARPODACUS + FINICOLA.

THE AUK:

A QUARTERLY JOURNAL OF
ORNITHOLOGY.

VOL. XI.

JANUARY, 1894.

NO. I.

HYBRID *PINICOLA ENUCLEATOR* + *CARPOD-
ACUS PURPUREUS*.

BY ERNEST E. THOMPSON.

Plate I.

THE EARLY part of 1890 is remembered at Toronto as the great Grosbeak season. During January, February and March, Pine and Evening Grosbeaks appeared in such numbers as were never before seen. On 22d January a small red Grosbeak was taken from a flock of Pine Grosbeaks by Mr. William Cross, and was brought to me for identification. Its general appearance recalled *Carpodacus cassinii*, but having no specimen of this for comparison, I sent the bird to Dr. J. A. Allen, who pronounced it "clearly a hybrid between the common Purple Finch and the Pine Grosbeak." The specimen was subsequently seen by Mr. Robert Ridgway and M. A. Suchetet, the French student of avian hybrids, and all concur in pronouncing it a most interesting and undoubted hybrid between the species named.

The only question raised by M. Suchetet is—was it born in a state of nature? For on that the chief interest would turn. To this I reply, the deep red tints that are found on the Pine Gros-

beak, the Purple Finch, the Crossbills and the European Linnet, are invariably lost in cage birds, and are permanently succeeded by a dull yellow or bronze tint. The specimen in question has all the deep and rich red tints of the brightest plumaged Pine Grosbeak. In addition to this the great difficulty of getting these birds to breed in confinement must be remembered, while the excellent condition of this specimen shows that it was accustomed to liberty. The absence of traces of cage-life and the fact that it was with the wild birds that came down from the north seem to indicate with almost certainty that it was a wild born bird.

I published a description of the specimen in the 'Transactions' of the Canadian Institute (Proc. Orn. Subsection Can. Inst. for Jan'y, Feb'y, March, 1890, pub. Toronto, Oct. 1890), but it was very brief and contains several printers' errors, as well as the blunder of removing my name from the article and substituting that of the collector. The following is a fuller description:

No. 1225 (Collection of Ernest E. Thompson): adult male, length, 6.75 inches; wing, 3.75; tail, 3.125; tarsus, .78; middle toe and claw, .78; beak, .50; depth of culmen, .43; width of gape, .375. In form, as in size, it is intermediate between the two supposed progenitors. The bill is as large as that of some *Pinicola*, and is swollen as in this genus, but it is without the hook. The wing is pointed, the second primary is longest, the order being 2, 3, 1, 4; the secondaries fall short of the point by .94 inch; the forking of the tail is .34 deep.

In general style of coloration it resembles a very highly colored *Pinicola*; no *Carpodacus purpureus* that I have compared it with at all approaches it in richness.

The head and neck are glossy crimson, deeper in certain lights, always deepest on the crown, and slightly tinged with yellow on the sides of the neck. The lores, chin and antrorse ruff are light brownish gray. All the feathers of the crown have dark centers, which, however, are concealed; on the cervix they show somewhat, and on the nape they give a slightly spotted or streaked appearance. All of this may be matched exactly in specimens of *Pinicola*.

The scapulars and interscapulars have dark brown centers and light brown edges, with a general cast of yellowish brown

except on the middle of the back and the middle of the scapulars, where a deep tinge of crimson suffuses all and overpowers the yellow. This may be exactly matched in *Carpodacus*, but I believe not in *Pinicola*.

The rump is of a deep clear rose color, exactly as in *Pinicola*. The upper tail-coverts are brownish ash with lighter edge, and a large spot of crimson or deep red on the inner vane of each. This also is as in *Pinicola*, but with the ashy gray of that species replaced by brownish gray, a replacement that is observed throughout.

The throat is of the clear rosy crimson of *Pinicola*, but on the breast it becomes tinged somewhat with the duller purple of the *Carpodacus*, and each feather shows a dark brown central line. The sides of the breast, the flanks and the body under the wings show the warm grayish brown of true *Carpodacus*, and have also the darker center of the latter. The belly is pure white and the crissum white with a rosy tinge, as in *Carpodacus*, but the under tail-coverts have dark central lines as in *Pinicola*.

The wing feathers are of a deep fuscous brown, each feather with a lighter edge, and the whole suffused with red, as in *Carpodacus*, but the three upper tertials are broadly edged with white, exactly as in *Pinicola*. The pale reddish margin of the median and greater coverts are exactly intermediate.

The tail feathers are blackish brown with pale red suffused edges, and may be exactly matched by examples of either species.

The color of the beak is intermediate, being of a deep brown horn color, darkest on the culmen, and palest at the base below. The color of the feet is deep brown, exactly intermediate.

Briefly, then, this specimen presents the rich, rosy and crimson tints and the white wing markings of the adult male *Pinicola enucleator*, but everywhere replaces the ashy tints of this species with the warm brown of *Carpodacus purpureus*. It has also the whole of the abdominal region white as in the latter, but in all other particulars of size, form and color, it is exactly intermediate.

THE LABRADOR DUCK — ANOTHER SPECIMEN,
WITH ADDITIONAL DATA RESPECTING
EXTANT SPECIMENS.¹

BY WILLIAM DUTCHER.

MR. ERNEST D. WINTLE, of Montreal, Canada, a member of the Union, reports a heretofore unrecorded specimen of the Labrador Duck in the Museum of the Natural History Society of Montreal. It is a male in immature plumage, and was evidently mounted from a dried skin; it bears no date or record as to whence it was obtained. He has searched through the Journals of the Society from the beginning to date and cannot find any mention of the specimen therein, and no person connected with the Society seems to know anything about it.

This is the third specimen discovered since the publication of my 'Revised List,'² and makes the known specimens in America twenty-nine, and the total number extant forty-one.

A less pleasant duty than the recording of a newly discovered specimen of this extinct species now devolves upon me. I would gladly escape the responsibility, but justice to the ornithologists whom I quoted in my former paper, and also to myself, compels the following remarks. Prof. Alfred Newton, in his 'Dictionary of Birds,' pp. 221-223, makes the following statement under the subject 'Extermination.'

"Far less commonly known, but apparently quite as certain, is the doom of a large Duck which until 1842 or thereabouts was commonly found in summer about the mouth of the St. Lawrence and the coast of Labrador, migrating in winter to the shores of Nova Scotia, New Brunswick, New England, and perhaps further southward. There is no proof, according to the best-informed American ornithologists, of a single example being met with for many years past in any of the markets of the United States, where formerly it was not at all uncommon at the proper

¹ Read at the Eleventh Congress of the American Ornithologists' Union, held at Cambridge, Mass., Nov. 20-23, 1893.

² The Auk, Vol. VIII, pp. 201-216, April, 1891.

season, and the last known to the present writer to have lived was killed by Col. Wedderburn in Halifax harbour in the autumn of 1852.¹ This bird, the *Anas labradoria* of the older ornithologists, was nearly allied to the Eider Duck, and like that species used to breed on rocky islets, where it was safe from the depredations of foxes and other carnivorous quadrupeds. This safety was, however, unavailing when man began yearly to visit its breeding-haunts, and, not content in plundering its nests, mercilessly to shoot the birds. Most of such islets are, of course, easily ransacked and depopulated. Having no asylum to turn to, for the shores of the mainland were infested by the four-footed enemies just mentioned, and (unlike some of its congeners) it had not a high northern range, its fate is easily understood."

My remarks may be divided into two heads: first, proof as to the date when the last living specimen was shot, and, second, the cause of the extinction of the species.

Date of capture of the last living specimen. — Professor Newton claims that "the last known to him to have lived was killed in Halifax harbour in the autumn of 1852," and in his foot note he refers to three specimens recorded in my 'Revised List' as "supposed to have been obtained between 1857 and 1861; but the information of the former owner of two of them points to an earlier time, and that respecting the third is somewhat vague. Still more uncertain are the rumours . . . of examples said to have been obtained in 1871 and 1878, but since lost. If they could be recovered a mistake would probably be found to have been made."

¹"It is needless to observe that no one at that time had any notion of its approaching extinction. The skin of this example is in Canon Tristram's collection, its sternum, which was figured by Rowley (Orn. Miscell. pp. 205-223), is in the Cambridge Museum. Mr. Dutcher (Auk, 1891, pp. 208, 211), reports three specimens supposed to have been obtained between 1857 and 1861; but the information of the former owner of two of them points to an earlier time, and that respecting the third is somewhat vague. Still more uncertain are the rumours, though properly printed by him (pp. 214, 215), of examples said to have been obtained in 1871 and 1878, but since lost. If they could be recovered, a mistake would probably be found to have been made. Modern American authors profess their inability to explain the extirpation of this species. I have little doubt that the cause mentioned in the text and published by me in 1875 is the true one. The shooting down of nesting-birds, witnessed by Audubon when he was among the islands of the Labrador coast, and year by year carried on with increasing intensity, could produce no other result."

The specimens referred to above are as follows: The Cory specimens, formerly the Boardman specimens, 1857 to 1860; the Brewster specimen, 1857; the Herrick specimen, 1871; and the Gregg specimen, 1878. This last specimen I make no claim for now, nor did I in my list. My statement there was "*specimens recorded, since lost.*" If the Gregg specimen had not been before recorded in a scientific journal of acknowledged good standing¹ I should not have included it in my list on the evidence furnished.

Regarding the Herrick specimen, however, no such doubt can possibly exist and the record can but stand, although the specimen was unfortunately lost. My previous quotations from Mr. Cheney, who shot the duck on the Island of Grand Manan, from Mr. Herrick, who received the skin from Mr. Cheney, and from Mr. Boardman, into whose possession it finally passed, were necessarily brief. Since then, however, I have had further correspondence and interviews about this specimen, the chief points of which I submit herewith. Mr. Cheney could furnish no further information regarding the specimen, but very kindly presented me with an autograph letter written to him by the late Prof. Spencer F. Baird, from which I quote as follows: "Wood's Holl, Mass., June 22, 1871. My Dear Mr. Cheney: Mr. Boardman has just informed me that you have sent him a female of the Pied Duck, which he would forward to us if we wanted it. As we do not possess a specimen in the Smithsonian Museum, I very promptly informed him that the specimen would be very acceptable."

Mr. Herrick verifies the date (1871) by the following statement: "In May, 1871, I was collecting about Grand Manan Island and stopped at the house of Simeon F. Cheney, a fisherman and gunner with an excellent knowledge of local birds. I obtained from him some skins, among them this duck which he had shot a few weeks before. It was the only one he had ever seen. Although I had at the time a very fair knowledge of our ducks, it was new to me. In returning home I left my traps at Eastport, Maine, and went to Calais, to visit Mr. Geo. A. Boardman. He was much interested in this duck and so anxious to obtain it that

¹American Naturalist, Vol. XIII, p. 128, February, 1879.

on my return to Eastport I sent it to him. He at once wrote to me that it was a female Labrador Duck and that he had sent it to John Wallace, of New York, to be mounted for the Smithsonian."

The above facts seem to me to be conclusive as to the date; now as to the identification. No ornithologist who is acquainted with Mr. Boardman can doubt for a moment his ability to identify any specimen of the American Anatidæ, especially so exceptional a species as *Camptolaimus labradorius*, and further, at the time, he had in his collection a specimen of the female Labrador Duck with which to compare it. Under such circumstances the veriest tyro could make a positive identification. That so careful a naturalist as Professor Baird had no doubt on the subject his letter quoted above would seem to indicate, and our ex-President, Mr. Elliot, tells me that he considers Mr. Boardman as able to identify a Labrador Duck as any one of us, and that he would accept what he said of the 1871 specimen without question. To still further fortify the good standing of this specimen I quote from Mr. Boardman, who says, "I am positive about it; I had my own pair and would have known the bird as soon as I would a Crow."

Regarding the Brewster specimen (1857): While I have no further evidence to offer as to the date, yet it seems unreasonable to doubt the correctness of the label, which was probably written at a time when there would be no object to be gained by falsifying it. One of its previous owners, William P. Turnbull, LL. D.,¹ evidently knew that it was rare, even in 1857, for in his 'Birds of East Pennsylvania and New Jersey,' published in 1869, he so states.

Regarding the Cory-Boardman specimen: No additional light can at present be thrown on the male bird, but I have fortunately been able to trace out the history of the female specimen by the aid of Mr. Boardman and Mr. N. Vickary, of Lynn, Mass. Shortly after the 'Revised List' appeared Mr. Vickary wrote to Mr. Boardman asking whether he, Mr. Boardman, had not purchased from him, in the early sixties, a specimen of the female Labrador Duck, and related the circumstances. Subsequently I obtained from Mr. Vickary the following information which fixes beyond doubt the date of the capture. "In 1862, I

¹ In my 'Revised List' the name is incorrectly printed "Trumbull" instead of "Turnbull."

took a trip to Labrador and on my return, one of the party, Mr. Arthur Thomas, of Boston, was boarding at Swampscott and while there shot this female duck in September. We returned the first of that month, so it must have been about the first week in September, 1862. When he brought the bird in I did not think enough of it to stuff it, so it lay several days on my floor; however, I did stuff it, and Mr. Boardman called to see me and bought it. I never had another specimen except the one referred to." Mr. Vickary has within a few hours seen the specimen in question in the collection of Mr. Chas. B. Cory and positively states it to be the bird shot at Swampscott in September, 1862, and sold by him to Mr. Boardman.

Professor Newton in quoting from my 'Revised List' either overlooked certain other specimens of a later date than 1852, or else selected those that he considered the most doubtful. Those omitted are as follows¹: The Lawrence specimen in the American Museum of Natural History, 1865 (p. 205); the Elliot specimen in the same institution (p. 205); the Bell specimen in the Smithsonian Institution, 1875 (p. 210); and the Pike record, 1858 (p. 216).

Mr. Lawrence says of the specimen formerly owned by him: "You can rely upon what I say about it. The date is correct."

Mr. Elliot says of the specimens formerly in his collection, now owned by the American Museum: "If Professor Newton says that the last Labrador Duck ever taken was killed in 1852, he is certainly mistaken. I had several in the flesh at various times during the ten years between 1852 and 1862, mostly females and immature males, and J. G. Bell had others, all obtained in the old Washington Market. The female and young male in the Museum were obtained in the flesh and prepared by Bell. I saw them before they were skinned. Also the full plumaged male in the Museum was procured from John Akhurst of Brooklyn; it was shot on Long Island, received by him in the flesh, and *I saw it*. He made a skin of it for me. I never procured any Labrador Ducks as early as 1852, all having been received several years after that date — I should say between 1855 and 1863."

¹ In this connection see 'Ornithological Miscellany' by Geo. Dawson Rowley, M. A., etc., Part VI, Jan., 1877, pp. 212, 219, 220, in which he quotes certain American ornithologists, and gives dates later than 1852.

Mr. Bell's specimen in the Smithsonian was purchased for that institution by Mr. Lawrence. He says of it: "I remember perfectly the Labrador Duck, male juv., bought from J. G. Bell for the Smithsonian in the fall of 1879; I think Bell's note on the label, 'Fall of 1875,' must be accepted as the time of its capture. This case is unimpeachable and changes Professor Newton's date materially."

The Pike record¹ is as follows: "In 1858 one solitary male came to my battery in Great South Bay, Long Island, near Quogue, and settled among my stools." Col. Pike is a sportsman with a scientific knowledge of birds and was the donor of the specimen of the Labrador Duck now in the Museum of the Long Island Historical Society,² and also of the major portion of their whole collection. It will be noted that Col. Pike states that the bird lit among his stools, and he therefore had an opportunity for positive identification. As he was fully acquainted with the species there can be no reasonable doubt of its correctness.

The records above given extend without any possible doubt the date of the latest capture of a specimen of the Labrador Duck nearly a quarter of a century, *i. e.*, to 1875, and thus brings the species much nearer to the present time than the readers of the 'Dictionary of Birds' would be led to believe.

In this connection Mr. Lawrence suggested to me a very pertinent enquiry regarding the extinction of the species when he was giving me the information about the young male specimen taken on Long Island, N. Y., in the fall of 1875, and now in the Smithsonian Institution. It was, "Where were the parents of the juvenile?" That two old birds were alive somewhere in 1875 is certain and possibly some additional young, as one offspring is a small brood. That many species of birds do not have more than one or two offspring in a season is well known, yet this does not obtain with the Anatidæ, which are usually prolific breeders. It is true that nothing whatever is known of the breeding habits of this species, yet allied species lay as many as five eggs in a clutch.

¹ Auk, Vol. VIII, p. 216.

² Auk, Vol. X, p. 268.

Cause of Extinction.—Professor Newton thinks it was owing to the persecutions of man during the nesting period, and also by reason of its not having a high northern range where it would, presumably, be free from such attacks: There is absolutely nothing known of the exact distribution of the species, nor of its breeding habits. In the literature on *C. labradorius* there is not a single fact relative to the above points given; all that has been written is conjecture. If so, why may we not consider that it did have a high northern range? Our President, Dr. Coues, in his 'Notes on the Ornithology of Labrador,' made in 1860,¹ says: "I was informed that though it was rarely seen in summer, it is not an uncommon bird in Labrador during the fall." This certainly points to a migration to Labrador, in the fall, from some other point further north. Its nearest relatives breed much further north than Labrador, and why not *labradorius*? The only statement we have as to its nesting habits is from Audubon,² whose son was shown nests on the top of the low, tangled, fir bushes which he was informed were those of the Pied Duck. If this is a fact, this species was free from the depredations of foxes and other carnivorous animals, and man only could cause its disappearance. The appearance of this species, and what little we know of its habits,³ tell us that it must have been a strong, swift flyer and thus able to protect itself from man after it had obtained maturity. We can speculate as to the cause of its disappearance, but we have no facts to warrant a conclusion.

Since the publication of my 'Revised List' (1891), two northern exploring expeditions have been made, and with both of them I sent copies of the plates of the Labrador Duck which appeared with the 'List.' The route of the expedition under the auspices of Bowdoin College was along the northeast shore of Labrador during part of July, August and until September 2, 1891. A party of four left the main body at Hamilton Inlet (Lake Melville), and penetrated the interior some 300 miles from the coast. The main party did not see nor hear anything of the species. On August 9, when some 200 miles up the Grand River, Mr.

¹ Proc. Acad. Nat. Sci. Phila., 1861, p. 239.

² 'The Birds of America,' 8vo. ed., Vol. VI, p. 329 (1843).

³ See 'Revised List,' Auk, Vol. VIII, p. 216.

D. M. Cole and his associate, Mr. Cary, saw a female duck with a brood of young which he was sure was this species. Unfortunately they had no shot-gun with them, as their only one had been lost a few days previously when their canoe was capsized in some rapids, so they could not procure either the old bird or any of the young. The only persons seen during the five weeks and two days the Grand River party were gone were a trapper and his family, six miles up the river, and a party of native Indians on the second day out. From none of these could Mr. Cole get any information of this species of duck. The facts obtained by this expedition, while negative, serve to point to the conclusion that the species has become extinct.

The second expedition was that under the leadership of Lieut. Peary, U. S. N., to Greenland. The ornithologist of the party was our fellow-member, Mr. Langdon Gibson, who has furnished me with the following interesting statement of his enquiries relative to the Labrador Duck, and the results, with which I will conclude.

“The Expedition sailed June 6, 1891, from New York. Friday, June 12, 1891, we reached Sidney, Cape Breton, but made no enquiries, as we saw no one who would be likely to know anything about the species.

“Monday, June 15, while passing through the Straits of Belle Isle, we stopped long enough to catch some codfish; here we were boarded by some French Canadians. I showed each one of them the plates of the Labrador Duck in my possession and they all shook their heads saying, in broken English, that they had never seen such birds.

“Saturday, June 27, we reached the settlement of Godhavn, Disco Island, Greenland. Here careful enquiries were made amongst perhaps a dozen leading hunters of the tribe. They also, through an interpreter (a Dane), said they had never seen the bird. Leaving Disco, we proceeded by slow stages, owing to heavy ice in Melville Bay, to our final camping grounds on McCormick Bay. During the ensuing winter nearly every male Eskimo in the tribe came to visit us, and so, from time to time, I questioned nearly every one of them on this subject, showing each my picture of the duck. On first seeing the picture, with few exceptions, each native exclaimed that they had ‘Tark-

kooed emis u-ah,' meaning by this that they had 'seen many.' They gave the duck the name 'Argly' and told me in the spring I could get many, also their eggs, at the head of our own bay. I was disappointed when the spring came to have my Labrador Duck materialize in the form of the Long-tailed Duck, which sure enough was very plentiful at the head of the bay.

"In August, 1892 (the latter part, I believe), on our way home we touched at Godthaab, the largest town in Greenland. Here we were entertained by Herr Anderson, the Danish Inspector of South Greenland, an accomplished naturalist, and at his house I had the pleasure of inspecting one of the finest collections of Arctic birds I have ever seen. I showed him my little pamphlet on the Labrador Duck, and also presented it to him on my departure. He told me that his collection represented twenty years' work, and all the hunters in South Greenland (some 500 men) had instructions to bring to him any strange birds that they might get. In this way he has added to his collection from time to time many rare birds and eggs. In all this time he claims to have heard nothing of the Labrador Duck, which I consider is substantial proof that within the last twenty years the Labrador Duck has not visited Greenland. From Godthaab we came directly home to Philadelphia, and this ended my ineffectual attempts at learning something more definite regarding this species."

REMARKS ON THE ORIGIN OF BIRD MIGRATION.¹

BY FRANK M. CHAPMAN.

AS A TEXT for the remarks I have to offer on this subject I have taken the following paragraph from Dr. Allen's paper on the 'Origin of the Instinct of Migration in Birds': "Nothing

¹ Read at the Eleventh Congress of the American Ornithologists' Union, held in Cambridge, Mass., Nov. 20-23, 1893.

² Bull. N. O. C., V, 1880, pp. 151-154.

is doubtless more thoroughly established than that a warm temperate or sub-tropical climate prevailed down to the close of the Tertiary epoch, nearly to the Northern Pole, and that climate was previously everywhere so far equable that the necessity of migration can hardly be supposed to have existed. With the later refrigeration of the Northern regions, bird life must have been crowded thence towards the tropics and the struggle for life thereby greatly intensified. The less yielding forms may have become extinct; those less sensitive to climatic change would seek to extend the boundaries of their range by a slight removal northward during the milder intervals of summer, only, however, to be forced back again by the recurrence of winter. Such migration must have been at first 'incipient and gradual,' extending and strengthening as the cold wave receded and opened up a wider area within which existence in summer became possible. What was at first a forced migration would become habitual and through the heredity of habit give rise to that wonderful faculty we term the instinct of migration."

This theory gives us, I think, as satisfactory a working hypothesis of the origin of bird migration in North America as we can hope to have. The few words I have to say relate to the influences which may have aided climatic conditions in establishing the habit of migration and which are probably effective in governing it to-day.

Most animals have an instinctive desire for seclusion during the season of reproduction, and when this season approaches will seek some retired part of their range or haunts in which to rear their young. Even our domesticated hens, turkeys, ducks, and pea-fowl, if given freedom, often travel a greater or less distance in search of a place where they may conceal their nests. Many species of tropical sea-birds resort each year to some rocky islet, situated perhaps in the heart of their habitat, where they may nest in safety. This is not migration in the true sense of the word, but nevertheless the object is the same as that which prompts a Plover to migrate to the Arctic regions, and, be it further noted, the movement is just as regular. These sea-birds pass their lives in the tropics, their presence or absence in any part of their range being largely dependent upon the food-supply. But, as in the case of a Warbler which nests in Labrador, they

are all affected at nearly the same time by an impulse which urges them to hasten to a certain place.

This impulse is periodic and is common to all birds. There is a regular nesting season in the tropics, just as there is a regular nesting season in the Arctic regions. It is evident, therefore, that external conditions have not created this impulse, though it is possible that in many instances they may have governed its periodicity. On the contrary, its causes are internal. In the case of the sea-birds, for example, dissection will show an enlargement of the sexual organs and it is this physiological change which warns the birds that the season of reproduction is at hand.

The organs of male birds apparently begin to enlarge before those of the females, and it is not improbable that this may account for the earlier migration of the males of many species. Furthermore, individuals found south of the breeding range of the species during the nesting season are generally barren birds, and their presence may be due to an absence of conditions which would impel them to migrate to the nesting grounds.

Now returning for a moment to the period of glaciation, it is not improbable that the period of reproduction may have been coincident with the return of the warmer part of the year and, in addition to the desire for seclusion and the pressure exerted by the crowded conditions of existence which then prevailed, was potent in inducing birds to seek breeding grounds in the north during the summer.

I do not presume to attempt to trace the varied influences of changing climate which, acting with the factors I have mentioned, have brought about the conditions of the avifauna of to-day, with its resident species and transient visitants, but will speak briefly of the two classes of our strictly migratory birds.

These are, first, those which breed continuously from our southern borders to the northern limit of their range; second, those in which an area of varying extent exists between the southern limit of their breeding range and our southern boundaries.

Examples of the first class are *Tyrannus dominicensis*, *Vireo calidris*, *Dendroica virgorsii*, and *Compsothlypis americana*. I believe the presence of these birds to be due to normal

extension of range. Certainly in the case of the first two there can be no doubt that in this way we can account for their occurrence in the United States. In them we have two abundant West Indian species, which, with a number of others, have become established on our southern boundaries. Whether they will gradually increase their northern range, as others have done before them, will of course depend upon the conditions they encounter. The second two present a similar case carried to greater extreme. The Pine-creeping Warbler nests from Cuba to New Brunswick, the Parula Warbler nests from Florida and Texas northward to Canada, and in its various closely related forms is found as far south as Brazil. These, like the two preceding, we may consider normal instances of extension of range.

In our own experience we have seen how readily a species responds to favorable conditions and how quickly it takes possession of territory adjoining its habitat when the conditions are favorable. These conditions I think are, first, absence of competition with species of similar habits; second, an abundance of food. Temperature I consider of importance only as it affects the food-supply.

The Pine Warbler (*Dendroica vigorsii*) illustrates this. Its habits demand pine forests and it is equally at home during the summer from the pines of western Cuba to those of New Brunswick and Manitoba. Its breeding range, therefore, lies between the summer isotherms of 80° and 64°, — excellent evidence that temperature alone is not the factor which determines its distribution, but temperature as it governs environment.

The Warblers which nest in the Canadian Fauna are good examples of our second class of migrants, or those whose breeding range is entirely north of our southern limits. Here we have species many of which winter in Central or South America and, returning in the spring, pass over thousands of miles to reach the region of their birth. I take it for granted that the members of this second class of more northerly migrants became North American at an earlier period than the members of the first class. This I think is proven by a study of the first class, in which we find species even now entering our limits, and also because it would be unheard of for a species to move its entire habitat thousands of miles, as these Canadian birds would have

had to do if we suppose them to have become North American since the advent of the members of the second class. Doubtless they may once have represented the first class and perhaps at that time all our migrants were confined to our southern borders,—this being presumably the condition of things during the period of glaciation,—but as a gradually changing climate advanced the isotherm which bounded the northern limit of their range, and with it the conditions they required, they followed it northward until even the southern limit of their summer home was carried further north than the northern limit had previously been, except where altitude gave them the surroundings needful to their existence.

As an illustration of how a northern habitat might be acquired I will instance the case of our Common Tern (*Sterna hirundo*) on the Atlantic coast. It is only a few years since this species was an abundant breeder along the greater part of the coast, but a demand arose for these birds for millinery purposes and, as the result, they are now restricted during the breeding season to comparatively few localities. On Long Island, for example, this Tern was a common summer resident but those birds which nested on the mainland were easily accessible to hunters and were soon exterminated, until at present few or no Terns nest on Long Island except a colony of about 1000 pairs confined to the small, uninhabited, isolated islet known as Big Gull Island. On the Massachusetts coast, practically the same thing has happened and Terns are now largely restricted to Muskeget Island.

What has occurred on Long Island and in Massachusetts will doubtless take place throughout the larger part of this Tern's American range. It breeds now from the Gulf of Mexico to the Arctic regions, but is the day far distant when the Common Tern will be unknown as a breeding bird in that part of its present summer habitat inhabited by man? Then its breeding range in America will be a boreal one, and just as the Terns of Big Gull and Muskeget Islands return year after year to the home of their birth, so will these northern breeding Terns return to their Arctic home, and have thus established a habitat similar to those of the birds in the second class of migrants I have mentioned.

But we may learn another lesson from these island-nesting birds.

Their case seems to me to be closely parallel to that of the sea-birds previously cited. It is probable that in both cases these colonies owe their origin to the instinct which guides a bird to return to the place of its birth. Those individuals which selected the most favorable breeding ground would rear their young in safety and the young returning would aid in forming a future colony. On the other hand, the progeny of those birds which did not select so safe a home would be less likely to survive.

Of this wonderful 'homing instinct' which plays so important a part in the migration of birds I have no explanation to offer. We know, however, that it exists, not only in birds, but in many other animals. It is this instinct, aided by the 'heredity of habit,' which guides a bird to its nesting ground. The Carrier Pigeon is taught its lines of flight by gradually extending its journeys; a species learns its routes of migration by gradually extending its range.

As for the desertion of the breeding grounds and consequent fall migration, there seems to be no question that it is due mainly to the failure of the food-supply. Nevertheless, many species of birds migrate long before there is apparently any reason for their doing so. Early in July the Snipes and Plovers begin to appear from their nesting grounds in the north. The first of August finds numbers of our land-birds crossing the Gulf of Mexico en route to their southern homes. Now, it has been frequently asked, if failure of the food-supply is the cause of the fall migration, why do these birds leave their breeding grounds at so early a date? In reply I would ask, why should they remain? The object for which they came is accomplished, and unless they are offered some special inducement to stay, why should they not return to the regions in which — and I would emphasize this — many of them pass two-thirds of the year?

The sea-birds I have mentioned desert their barren homes as soon as their young are on the wing. The Arctic-nesting Snipe and Plover hasten from the north to more fruitful feeding grounds further south. In fact, as soon as the cares of the nesting season are over, the summer home seems to possess few attractions. Some birds at once hurry back to their southern resorts, while others wander at will around the country, pausing wherever food is abundant, and do not retreat southward until they are actually forced to do so.

HABITS OF THE DOUBLE-CRESTED CORMORANT
(*PHALACROCORAX DILOPHUS*) IN
RHODE ISLAND.

BY GEORGE H. MACKAY.

I FIRST visited West Island, Seconnet Point, Rhode Island, in April, 1869, and with three exceptions have passed a few days there every spring since. It was while there during April, 1870, that my attention was first attracted to the Cormorants which I often saw flying about (a few every day) and alighting on the water close to the breakers near the island. This frequency did not, however, continue, for after 1872 they ceased visiting the immediate neighborhood of the island and I have not seen one alight there since. I have, however, seen more or less of them in April every year flying past the island as they passed from one place to another. I soon learned something regarding their movements and roosting place, which was on the Cormorant Rocks, located three and a half miles west of Seconnet Point and three quarters of a mile southwest from Sachuest Point on the Newport shore.

Although often intending to visit these rocks for the purpose of securing some of the Cormorants, I have never done so until this year. I have nevertheless watched them on the island with the aid of the large glass and seen them many times come, just before sunset, to roost on the rocks above mentioned. During my shooting experience on the coast I have taken only a very few Cormorants, or Shags as they are commonly called, for the reason that I never went after them, and also because they usually avoid passing within gun shot of a boat. I remember shooting one, a lone bird, off a headland at Swampscott, Mass., many years ago (species not noted), and one on January 29, 1866, and two on February 8, 1866, in South Carolina (known there by the colored people as 'Nigger Geese'). On October 5, 1877, I shot a lone *Phalacrocorax carbo* on Nantucket Island, Mass., and still another of the same kind on April 21, 1889, off West Island, which comprise all I have ever taken.

It was during my recent trip to Seconnet Point, April, 1892, that I determined to visit the Cormorant Rocks, should the weather and sea be sufficiently favorable for making the trip, it requiring a calm sea and off shore wind in order to effect a landing. When other conditions prevail it is a most forbidding and dangerous place to attempt a landing, surrounded as it is with an impassable collar of surging surf and foam, while rising from the centre are the black jagged rocks surrounded by a nearly flat mesa-like apex crowned with a cap of Fusi-yama whiteness as it glistens in the sunlight, but *not*, however, composed like it, of immaculate snow, but of *limc.* Such a day as I had wished and waited for was April 19, 1892, and as I rode at anchor in my little boat off the seaward side of West Island (which lies off the extreme point of Seconnet Point) shooting Scoters, the sea was calm, as it had been for the two days previously, and a gentle breeze blowing from the northwest completed the desired requirements. Perceiving a large cat-boat belonging to two Swedish lobster-men coming towards me, I motioned to them to come up in the wind, as I wished to board and speak with them. This they did, and I soon arranged for them and their boat to carry me to the rocks, to remain all day and return to West Island at night. Wishing to go on shore to secure a few things before starting I instructed them to stand off and on near the island and I would wave for them to come for me in their small boat when I was ready to start. We filled away about nine o'clock A. M., and just before ten o'clock, we were off the rocks. Putting my things into the small boat, one of the men rowed me to the rocks near at hand. After waiting awhile for a favorable opportunity to land, for it was breaking all around, in we went through the surf without taking in scarcely any water and landed on the rocks where I remained until sunset.

These low lying black rocks have been in the past, and are still, the resort and roosting place of all the Cormorants living in and around these waters, and as they undoubtedly received their name many years ago from such occupancy it may be interesting to know that on a map dated July 20, 1776, which is in an atlas called the 'American Neptune,' published in London in 1776, and surveyed by Des Barres, that these identical rocks are cor-

rectly shown and located under the name of the 'Cormorant Rocks.' It would not, therefore, seem unreasonable to infer that they were so named on account of being frequented by these birds at that early period, or even before. If such a conclusion is admissible it would show an occupancy of certainly one hundred and sixteen years, and possibly for a longer period, as well known local names are preserved when feasible in order to avoid confusion. There is, however, other evidence of long occupancy of still greater interest to the ornithologists, in the fact that I discovered, on careful examination, that many of the projections of the rock on the mesa top, which afforded good *standing* places, had apparently been worn *smooth* and *glossy* by long use. These resting places sloped down on the sides, affording the birds, when standing on them, convenient places for ejecting their excrement, there being invariably a deeper deposit of lime at their base than on other portions of the mesa top, which was also covered with such deposit to a greater or less degree.

On the flat top of the rock I found and saw a large number of curious *balls* (and brought fourteen away with me) varying from an inch to two inches in diameter and composed almost entirely of fish bones, chiefly the bones of young parrot-fishes (Labroids) and drums (Sciænoids)¹ firmly cemented together with gluten, hard in the dried specimens and soft and gelatinous in those more recent. One of the largest of the former, which was five and a quarter inches in circumference and quite black, while all the others were of a light color, contained three crabs (*Cancer irroratus* Say = *Panopeus sayi* Smith) in a fairly perfect condition, with some of the claws still remaining in place, showing they were probably swallowed whole. I am consequently inclined to the opinion, in the absence of absolute facts, that these birds, like the Owls, have the power of ejecting indigestible substances.

The Cormorant Rocks are of small area, the mesa top being only about thirty or forty feet square (estimated), the greater part of which is covered with a deposit of lime, its depth varying

¹ I am indebted to Mr. Samuel Henshaw of the Boston Society of Natural History, and to Mr. Samuel Garman and Mr. Walter Faxon of the Museum of Comparative Zoölogy, Cambridge, for aid in identifying the composition of these balls.

from one-eighth of an inch to two inches. This portion of the rocks is the only part not washed by the waves, except during a severe storm. On it are three or four small pools of a few feet area, of greenish water, being an accumulation of rain water and drainage. Extending several hundred feet towards the southwest, and forming a part of the main rock, is a low black ridge of jagged rocks, over which the sea usually breaks with fury, lashing into foam the surrounding water. The only place where a landing can be effected, and then only in moderate weather, is on the inshore side of the high rock. The mesa top of the rocks seems to be the favorite spot for the birds to rest, although there are two other places lower down, one of which is separated from the main rock, on which I have frequently seen them standing. As may be supposed, on my arrival I found the odor was sufficiently strong to pervade the surroundings; it took, however, but a short time to become accustomed to it, and it caused me little or no inconvenience while I was there.

After a careful survey of my surroundings I selected as favorable a place as I could find for concealment, and sat down to await the coming of the birds. As the Cormorants leave these rocks between daylight and sunrise in quest of food and do not begin to return, except a few scattering birds, until about five o'clock P. M., especially if the weather is moderate and the sea calm, I had little hopes of seeing much of anything meanwhile. Nor was I disappointed, for I saw only six of the Double-crested, and three of the common Cormorants (*P. carbo*) in all, up to half past five P. M. I shot one (*P. carbo*), a lone bird, but in falling in the water close to the rocks the surf drove it into a cleft from which it was impossible to regain it, much to my regret. Of the Double-crested (*P. dilophus*) about a dozen were shot down, only five of which (all males by dissection) were saved, owing to the necessity of having to keep the large boat away at a distance of nearly half a mile, in order that it might not frighten the birds and prevent them from coming to the rock, there being no place where a small boat could be kept out of sight in safety. Therefore those that were shot down were only secured after considerable lapse of time, and only those birds which had been shot dead were recovered.

Although these Cormorants had probably been undisturbed for a long time (I have never heard of any one going after them)

previous to my visit, they were most vigilant, being noticeably careful in looking the rock well over and flying around it before coming within shooting distance. Those birds which were only wounded disgorged soon after striking the water, and I saw a Herring Gull (*Larus argentatus smithsonianus*) pick up and swallow an eel one of them had ejected after being shot down. All the Double-crested Cormorants (*P. dilophus*) obtained had eels (*Anguilla vulgaris* Turton) in their throats. In four of the birds the heads of the eels had been apparently torn off, and they rested in the throat in every instance in the form of a loop or ox bow, the two ends being nearest the stomach. In the fifth and largest bird an eel in perfect condition, measuring sixteen inches long and one inch in diameter, rested lengthwise in the throat with the tail at the mouth. Those taken from the other four birds were seven to ten inches long. It would therefore seem that eels constitute a large part of their food in this locality, at least at this time. I also picked up on the top of the rock an eel in a partially dried condition, minus its head, which was probably seven or eight inches long before the head had been torn off; it was in the form of an ox bow or loop, having dried as it was probably ejected. I am puzzled to know just where or how so many eels could have been obtained so early in the season. It is possible the birds may have discovered some spring hole near the mouth of some creek or river which, being warmer than the surrounding water, gave to the eels a vitality which they otherwise would not have had so early in the season; and the Cormorants having made such discovery, used it to their advantage. If so, I infer the birds must have performed the greater part of their fishing somewhere up the Seconnet River.

When approaching the rock the birds usually fly about and often completely encircle it before alighting. I also noticed that they were very apt to first alight in the water near at hand where they remained for a little while, especially if the weather was moderate, before flying up to roost on the rocks. This I have seen them do repeatedly. At the date of my visit (April 19, 1892) I should estimate the number of Cormorants frequenting these rocks, and which were apparently all Double-crested (*P. dilophus*) at about one hundred and fifty. Between half past five to six P. M. on April 19, 1892, I counted sixty in one flock,

twenty-five in another, eighteen in another, and scattering flocks of seven or eight each, down to a single bird (it is of course possible that I may have seen some birds more than once); and although the greater portion flew near enough for me to see them very plainly, I failed to detect any of the Common Cormorant (*P. carbo*) mingled with them. They seemed to make little disturbance of the air in flying with their slow measured movement of the wings, and it can be truly said that they came and went silently. While on the rocks observing them I failed to hear them utter any sound whatever. Their movement towards the rocks did not reach its height until quarter of 6 P. M. The greater part of the birds came from a northeast direction, and flew close to the water; those coming from the west were always flying higher up (100 to 150 feet), probably coming from a longer distance.

As I have before said, the birds leave the rocks in the morning, about sunrise or a little before, to go in search of food, as I have noticed those which passed West Island, flying towards the east, did so at about that time. My Swedish boatmen informed me that they had seen the Cormorants on the rocks early in March, 1892. While I was watching, a Double-crested Cormorant alighted in front of and near me on the rock. The movement was so light and graceful as to cause me much surprise, as I had heretofore regarded them as clumsy. This bird alighted with the ease of a Robin on a twig, and stood erect with legs straight and neck extended. On April 15, 1892, the first birds alighted on the rocks to roost at 6.02 P. M.; and I counted eighteen in sight on the rock through the large glass. On April 16 the first bird alighted at 6.20 P. M., and one minute later there were eight, a flock of seven having come on. On this evening most of them seemed to come from the west, yet I believe that they must have passed around the rock to that side, flying so close to the water that I failed to perceive them as I looked through the large glass, as I believe that most of the birds must procure their living somewhere up the Seconnet River. On April 17 there were seven birds in sight on the rocks at 6.24 P. M. On April 18, at 5.22 P. M., there were about thirty in sight on the rocks, and at 6.15 P. M., there were forty or fifty. The north rock (of small area) was first covered with them;

those coming later located on the mesa top of the main high rock, before going to which I could plainly see them flying about the rock and alighting in the water. The formation of Cormorant Rock is such that it shelves towards the west, and I think there were undoubtedly many more birds there which I could not see, owing to my point of observation (West Island) being to the eastward of the rocks.

When wounded and on the water the neck is carried upright to its fullest extent, with the bill invariably pointed upward at an angle of forty-five degrees, giving the birds a most *snaky* appearance. As they are expert divers and swimmers, it is next to impossible to retrieve them when only wing-broken or wounded. When dead and floating they have less buoyancy than any water bird I ever shot, the head and neck sinking below the surface and apparently dragging down the body by their weight, so that the bird makes but little more show than a dead Old Squaw (*Clangula hyemalis*).

I was naturally curious to know what effect my invasion of their precinct had on these birds; so on the day after my visit to the rocks, and occasionally for several days following during the remainder of my trip, I looked for them through the large glass. At noon, on April 20, there were eighteen birds standing on the highest part of the mesa rock. These I think were probably some which had not come to the rocks during the time I was there, for with this exception they were the only ones I saw *on* the rocks during the remainder of the time (several days) I was at West Island. At sunset, on April 20, the birds were flying about the rock and alighting in the water as usual, the weather still continuing moderate and the sea calm; but none apparently dared to alight on the rocks, at least as long as it was light enough for me to see them through the glass, and considerable distrust had apparently been created as to the rocks being that place of security and rest they had been led by long occupancy to suppose. I, however, sincerely hope and believe that they will be well over their troubles long before next spring, and back to their customary home on the rocks as usual.

When flying south on migration, their manner of flight resembles that of migrating Geese. They first appear on the Massachusetts coast about the middle of August, the height of the

movement being in September, some of the flocks then numbering sixty or more birds. During such migration they are frequently mistaken for Geese or Brant, especially when passing over the land two to three hundred yards high. In very windy and rough weather they have been known to pass over the land very low down, in one instance within ten feet of the ground, but this is very unusual. Mr. Geo. A. Tapley of Revere, Mass., shot one of three (variety not noted) which were standing on the edge of a marsh in that place in the winter, at a time when there was much ice around. They were engaged in eating a sculpin (*Cottus scorpius* Linné, subsp. *grænlandicus*); whether caught by one of them or found on the shore was not known; the belly and entrails had been eaten at the time he disturbed them.

The only other resort of these birds in Massachusetts or Rhode Island, of which I am aware, is on the 'Graves,' some rocks situated outside of Boston Harbor, Mass., a place which has also been a noted resting and roosting place for Cormorants for a great many years. Last year in this locality the flight of Cormorants was apparently large, the birds being more numerous than usual, but for some unknown reason very few remained at this resort. On some days five hundred to one thousand (estimated) birds have been known to pass this place while migrating south. They are very gregarious. The *Common* Cormorant (*P. carbo*), like the *Common* Guillemot or Murre (*Uria troile*), is *uncommon* on the Massachusetts and Rhode Island coasts, and is not often taken, as far as I am aware. The *Double-crested* Cormorant (*P. dilophus*), as I have here shown, is not at all uncommon.

The immature birds of *P. dilophus* are of a general brown tint all over, with a greenish shade on the back and upper tail coverts, the lower parts being light brown. The rounded end of the feathers which cover the entire back when the wings are folded are at this period but imperfectly defined, but in the fully adult bird they are dark drab gray, and contrast boldly and harmoniously with the beautiful dark velvety green of the rest of the adult bird's plumage. The adults of *P. dilophus* seem to vary considerably in size, judging from those I have seen, and the sexes are not distinguishable to the ordinary observer by their general appearance, being apparently alike. The downy young are dark brown all over.

A FURTHER REVIEW OF THE AVIAN FAUNA
OF CHESTER COUNTY, SOUTH CAROLINA.¹

BY LEVERETT M. LOOMIS.

CONCLUDING OBSERVATIONS ON MIGRATIONS.²

THE conclusions reached in this portion of the article, while based on the observations of fourteen years in Chester County, South Carolina, have been tested and corroborated by the facts bearing upon the migration of North American birds found throughout the literature, and by a study of the earlier southward movements at Monterey Bay, California, from the latter part of June to near the end of August, 1892.

I. Variability in the Occurrence of Transient Migrants.

Variability in the occurrence of transient migrants in a given locality may be said to be of two sorts, that which is periodic and that which is erratic.

Periodic Variability.—This is illustrated in such birds as habitually occur more sparingly in this region in the southward migration than in the northward, and *vice versa*: examples, the Bobolink and Yellow Palm Warbler, most abundant in spring, and the Chestnut-sided, Blackburnian, and Palm Warblers, most abundant in autumn. Such seasonal variation in abundance can be explained only in two ways, either the majority pass to one side or else they pass over without stopping. It seems highly improbable that smaller land birds of abundant and extended distribution uniformly pass directly over this locality without being fairly represented in some stage of their movement, for it appears hardly possible that there should be so nice an adjustment of suc-

¹ Concluded from Vol. VIII, pp. 49-59, 167-173, and Vol. IX, pp. 28-39.

² Read in part before the Eleventh Congress of the American Ornithologists' Union held in Cambridge, Mass., Nov. 21-23, 1893.

cessive waves every year as to lead to such a result, particularly in species in the southward migration, like the Canadian Warbler, having a breeding range similar to that of others occurring regularly, as the Black-throated Blue and Blackburnian Warblers. On the other hand, there might easily be a shifting of the line of migration to the eastward or westward. This is exemplified in the Bobolink, which is abundant along the South Carolina coast in autumn, but only so in the interior of the State in spring. Of birds breeding in the mountains to the northward — habitually rare or absent here in the southward migration — the case might be somewhat different, for the first migratory movement might take them to the region below, stragglers only dropping by the way. The failure of northern born representatives of species like the Rose-breasted Grosbeak and Canadian Warbler to appear later, regularly here or in the country below the fall-line in this State and North Carolina, considered in connection with the fact of the habitual occurrence of other species breeding in the mountains, tends, however, to prove that a more westerly route is pursued in such instances, the trend of the mountains probably being followed, only the outskirts of movements reaching the Piedmont Region. In spring, in the northward migration, the Rose-breasted Grosbeak and Canadian Warbler apparently bear further to the eastward bringing this locality more in their path. The abundance of the Blackburnian and Palm Warblers in autumn, like the scarcity of the Bobolink, is also seemingly attributable to deflection to the eastward.

It does not follow because absence or rarity in successive years through the whole course of a migration may be due to shifting of route that waves may not pass directly over a locality without their being manifested through the stopping of the birds. Such a phenomenon in actual occurrence was witnessed by me at Monterey Bay, California, during August, 1892. An extensive movement of Northern Phalaropes took place during the first week of the month. The height of the movement was during the forenoon of the second day, when there was a continual succession of flocks moving rapidly down the coast. They flew but a few feet above the water, following the shore-line of the Bay, rounding Point Pinos, and heading steadily southward.

They kept well away from the land. None were seen nearer than a mile, most were out beyond two miles. At midday, over several square miles, a few solitary individuals were seen on the water. All the others had disappeared, had passed over without stopping. On the 10th a second and apparently greater flight began, reaching its height on the 12th. As before, all flew steadily southward along the line of the shore. They came nearer to the land, however, on the day of greatest abundance, a heavy fog having set in. When it lifted it was seen that the inshore edge of the movement was within five hundred yards of the surf at Point Pinos — a sort of local shifting having transpired. The flocks were quite noisy as they passed onward through the fog. The constant utterance of their call notes not improbably aided those further out to keep their course. No stragglers were noticed on the water during the fog or after it. All had passed over. From the 15th onward there were feeble movements along, but no rushes. The birds were inclined to approach the shore nearer than at first, and loiterers were found quite numerous upon the water. Perhaps these later birds were not the tired ones that had dropped by the way and resumed their journey, nor those that had been delayed in starting, but arrivals from stations further north, the advance guard of others that subsequently followed, as I was informed, and made the Bay a resting place.

On land such a migration as described would readily have escaped notice in its earlier stages. The concealment afforded by the vegetation would cause stragglers to be overlooked, and the greater perils and the artificial and natural obstructions would necessitate a higher flight being maintained.

To summarize: When a smaller land species is habitually rare or absent in this locality through the whole course of either movement, it is held, aside from the influences of environment, that the cause lies in the shifting of the line of flight to the eastward or westward, not in a continual passing over of successive waves.

Erratic Variability.— Lateness of arrival, unusual scarcity or absence, exceptional abundance or occurrence, exemplify erratic variability. These irregularities of migration may reasonably be attributed to variableness in the location of isolated communities, variation, eastward or westward, of starting point bringing about

variation of route, and to meteorological conditions, occasioning deflected, arrested, regurgitated, and involuntary movement.¹

An instance of deflected migration appears to be afforded in the presence of the Bobolink here in unwonted numbers in August, 1887, after a violent gale along the North Carolina coast. Perhaps additional instances are found in the relative abundance in different springs of the Rose-breasted Grosbeak, and also of the Canadian Warbler, and in their casual presence in autumn. The 'tidal wave' mentioned by Drs. Coues and Prentiss in 'Avifauna Columbiana' (pp. 31, 32) seems to have been due to deflection—deflection apparently from the Appalachian Highlands. The height of the 'wave' was doubtless increased by a subsequent arresting of its progress through cold to the northward.

Local deflection occasioned by fog has incidentally been referred to in the Northern Phalaropes at Monterey Bay. A more striking illustration was furnished in two purely pelagic species in the same locality. On the morning of August 4 a heavy bank of fog which had been resting over the ocean beyond the headlands set into the Bay. I was out on the Bay, several miles off Point Pinos, at the time. Soon after the coming of the fog a number of Shearwaters were seen a little further out, flying rapidly seaward. In a short time they were followed by others, singly, in little companies, and in straggling flocks of considerable size. As the fog became denser it was seen that their line of movement was bearing more and more toward the south shore. Their flight was near the surface of the water, and, as there was a heavy swell, when the boat was in the trough, as they suddenly appeared in the fog over the crest of a wave, it seemed almost as if they emerged from the wave itself. When the boat was sighted, if too near, they would diverge from it so as to pass to one side, but without altering

¹ Destruction of bird life by storms, especially during migration over extended bodies of water, has not been enumerated as among the probable causes of erratic variability, for the mortality would have to be very great indeed, far above the average, to be generally appreciable along the avenues of migration. There would have to be wholesale extermination among the legions of a species to produce marked diminution, which could only be followed by continued scarcity during recuperation—an event that has not come within the range of my observation. The disastrous effects of the elements would be more readily perceived on the breeding grounds.

their general course, which was directly out to sea. There was no going and coming from rookery to feeding places as in Brandt's Cormorant. Their flight was all one way, parallel with the coast-line that would lead southward. The specimens taken showed that both the Dark-bodied and Pink-footed were represented, the former predominating. After an hour or two the fog began to break along the south shore, and as it rapidly retreated seaward, the line of movement receded, the birds keeping just without the denser mist.

The arresting of the progress of a movement in a locality would necessarily present the appearance of extraordinary migration — such as is often termed a 'bird wave.' An apparition of this kind has been reported by Mr. Philip Cox (*Auk*, VI, p. 241). The actual stoppage of a vast army of Robins, Song Sparrows, and Slate-colored Juncos by a snow storm was witnessed by him one morning in April, 1885, near Newcastle, New Brunswick. When occasion for migration was urgent its interruption just below a locality in the northward movement or just above it in the southward might be expected sometimes to bring about a twofold result — scarcity or absence for a time in the locality, as there would be no necessity for an early stop, and a wave of augmented proportions in the territory in which the first pause was made. The varying size of waves when the highway of migration is clear may, perhaps, in part be thus accounted for, by previous damming up and concentration. The apparent smallness of a wave may not improbably be due sometimes to its centre of abundance not resting in a locality, it being above or below or to one side of it during the halt. During the reign of ice and snow, interruption of northward progress not infrequently results in a regurgitated movement, when occurring to the northward of this locality, as has been stated in previous portions of this article, having the appearance of a wave from below. In this connection, see 'Report on Bird Migration in the Mississippi Valley,' pp. 29, 30.

An exemplification of involuntary migration is seemingly afforded in the great flight of Killdeers that appeared suddenly along the New England coast in the latter part of November, 1888 (*Chadbourne*, *Auk*, VI, p. 255). This movement was apparently from the southward, in the path of a storm.

Variability imputed to variableness in the location of isolated communities, entailing variation in paths of movement, is yet to be spoken of. Upon such ground appears to be explained the lateness of arrival from the south of the Yellow-throated Warbler in years when other early migrants were not belated—a variation within narrow limits in the route pursued by the vanguard being the probable cause of tardiness. In the years of early occurrence there was no indication that the migration of this species was obstructed, either by influences in this locality or above it. The conditions seemed especially favorable, rather than adverse.

The reported wandering northward of hornotines in certain species (as the American Egret and Little Blue Heron—Rep. Bird Migr. Miss. Vall., pp. 82, 83) presents a curious phase of erratic movement. A sort of irregular migration is manifested in the occurrence of ‘accidental visitants.’ It is surprising, rather than otherwise, that birds do not stray more frequently from their normal range, considering the possibilities of their being storm-driven or of becoming bewildered and losing their course. As movements pass over and around localities it follows that a station in advance may sometimes be occupied earlier than an intervening one.

To recapitulate: Periodic variability—habitual absence or habitual comparative scarcity in one movement and customary presence or customary greater abundance in the opposite—in this locality is ascribed, aside from the influences of environment, to semi-annual change in line of migration, a different route being followed in the northward movement than in the southward. Erratic variability—irregular and uncertain occurrence, in transient migrants—is attributed to variation of route through variation, eastward or westward, in the location of isolated communities, and to diverting meteorological agencies, causing deflection and interruption of movement, the former manifested particularly through the presence or increased abundance of species whose ordinary highway of migration lies further to the east or west, the latter by the stoppage of progress in the locality, above, or below it, resulting sometimes in regurgitated and involuntary migration.

Local Causes, affecting Distribution, producing the Appearance of Irregularity of Migration.—Causes underlying local

distribution often tend to give the appearance of exceptional abundance, or the opposite, rendering more apparent, or less so, the movements that are taking place without obstructing them. Influences affecting the food-supply are most potential. Wilson's Snipe is particularly abundant here in the northward movement during wet seasons, the rain increasing the limited food area by rendering the high 'black-jack' lands boggy. September 6, 1888, it rained heavily for seven hours, terminating a drought that had been prevailing and converting the level 'black-jack' fields of recently sown oats into swampy flats. An isolated patch of four or five acres, immediately after the rain, held more Pectoral Sandpipers than it was ever my fortune to see before in this locality at one time. Until the ground was dried this spot was a rendezvous for passing Sandpipers, the species varying from day to day. Such birds are seldom seen here away from mill-ponds, as congenial haunts are wanting, though sometimes observed high overhead in the flush of migration. Nighthawks, Chimney Swifts, and Swallows are most conspicuous during migration in damp weather. Excessive rain causes the American Woodcock to appear more numerous when migrating through its desertion of the low grounds. An especial instance was during the latter half of August, 1887, which was a month of continual rains.

The fields of heading oats attract passing flocks of Bobolinks in May. In September when the crop is being harrowed in, the Killdeers, in the height of southward migration, occupy the same ground—a plantation devoted to this grain showing an abundance to be observed nowhere else in the neighborhood. A large bed seeded to clover the first of May in a yard in the town of Chester, became the scene of quite a gathering of Indigo Buntings, mostly males, one season. They reached the number of a score and remained until all the seeds were eaten up. Their presence excited some comment, and curious were the explanations advanced to account for it, whence they came being a mystery.

Variability as occasioned by Topographical Conditions.—As is well known, localities on the same parallel, owing to different topographical features, often exhibit diversity in time of occurrence similar to that arising from difference in latitude. The appearance of north-bound migrants along the course of the larger rivers earlier than in the adjacent territory in the Missis-

sippi Valley is frequently alluded to in the 'Report on Bird Migration.' In this locality this is seen in miniature, the first arrivals from the south in many species usually being found along the streams leading to the Broad and Catawba Rivers and the Low-Country. On the coast, in the northward movement, birds, as a rule, appear sooner than in the Piedmont Region. For example, Dr. Coues mentions the occurrence of the Tree Swallow in numbers at Fort Macon, N. C., in January (Proc. Acad. Nat. Sci. Phila., 1871, p. 21). In this locality none have ever been seen before March. The loitering of species along the coast in autumn lengthens out their period of migration, the closing movements taking place later than in the Piedmont Region.

II. Variability in the Occurrence of Breeding and Winter Residents Independent of Failure of Food or Severity or Mildness of Season.

Isolated Communities.—The spirit of gregariousness is a marked feature in bird life. It is manifested after the breeding season in the woodland groups of associated Titmice, Chickadees, Kinglets, etc., in the winter assemblages of Vesper Sparrows, American Crows, Meadowlarks, or Robins, and in the congregation of the highly gregarious species, as the 'Blackbirds' and the Passenger Pigeon, and in a lower degree in the breeding colonies where the birds are generally dispersed within circumscribed limits, as in the Grasshopper Sparrow, and perhaps as in the Scarlet Tanager as observed by myself at Cæsar's Head (Auk, VIII, p. 329) and other birds similarly restricted. As the spirit to concentrate is so dominant, and as there is local distribution even within the narrow bounds of a neighborhood, it is not strange that there should be local distribution involving larger areas, particularly where a species is not sufficiently abundant to fully occupy a territory, either through actual paucity, or because the territory is on the borders of the habitat. So it happens that toward the extremes of range the individuals of a species, in many birds at least, are inclined to aggregate into isolated communities, being more or less plentiful in a particular locality while the

surrounding country is not inhabited, or at best but very sparsely so. Thus in this vicinity the Robin has been found to be of rare occurrence in the breeding season except in a single locality where a colony has flourished for years. The Grasshopper Sparrow, though very common, is likewise local here as a summer resident. At northern extremes of breeding range this gathering into isolated communities appears to be illustrated in the Blue Grosbeak, Mockingbird, and Carolina Wren. In winter time it is conspicuously exemplified in the Robin. Here in Chester County they may be wanting in December and January, and yet be abundant in a locality far to the northward. This, too, when the bulk of the species on the Atlantic Slope winters to the southward of this region. Certain essentially trans-Appalachian species are inclined to be very local on this side of the mountains, as the Dickcissel in summer and Leconte's Sparrow in winter. Henslow's Sparrow and Bewick's Wren appear to afford examples of local distribution where a species, in the aggregate of individuals, is not sufficiently abundant to populate the region embraced within the central portions of its range. As has been indicated, isolated communities vary in character. A single company or a small colony may alone represent a species in a locality, or numerous flocks may occur, as is sometimes the case in the Robin, or there may be general dispersion, as in Bewick's Wren. It may be queried whether an incipient disposition to gregariousness, perhaps limited chiefly to contemporaneous migratory movement, may not be a factor in the geographical distribution of many birds, in the more common species it being manifested by dispersion over widespread areas, and in the rarer, either by restriction within narrow boundaries, or by segregation into isolated communities or local centres of distribution.

It remains to be said that local distribution dependent strictly upon environment is not to be confounded with the isolated communities spoken of. Uncongenial situations are not inhabited. Land birds do not resort to water, nor do typical woodland birds frequent the fields.

Variability in the Location of Isolated Communities.— While the Robin may breed locally year after year in the same locality, other species also local here in distribution may occur

irregularly, being present for one or more seasons and then rare or absent for a varying period.¹ The Dickcissel is a remarkable example. During the first half dozen years I paid attention to the birds of this section it was not observed, then it was common locally for two summers. Afterwards it was not met with though my observations were continued six years longer.² A parallel on a smaller scale, immediately under the eye, appears to be supplied in the shifting of breeding grounds, as observed here in the Meadowlark — a particular field being in favor for a single season or longer and then deserted and another, perhaps a mile or two away, occupied. In lapse of time there may be a returning to former haunts. The Meadowlark is also more numerous in some summers than others. This fluctuation in abundance is esteemed to be but a more extended shifting of breeding grounds — the position of isolated communities varying so that different localities are occupied in different seasons. As the increase is abrupt instead of gradual it is obvious that the fluctuations do not arise from destruction of the birds. It has not been determined that storms in any way influence the location of isolated communities.

The irregularity here in winter of the Robin, Bewick's Wren, and certain other birds has been commented upon at length in a former part of this article, and explained also on the ground of variability in location of isolated communities. A parallel in miniature seems to be found in the restricted distribution of some of the less abundant winter birds of this neighborhood, particular situations being frequented for the season to the exclusion of others apparently equally attractive. That migration does not fail to take place in the Robin or Bewick's Wren when either is wanting in winter is proven by their occurrence during the height of migration. The presence of the

¹ I speak with some positiveness of the absence of birds, as I have had opportunity for thorough observation, not having been trammelled by the restrictions prevailing in more thickly settled communities.

² Instances of its erratic appearance or abandonment are not wanting in other localities. Cf. Langdon (Ohio), *Abst. Proc. Linn. Soc. N. Y.*, No. 5, p. 11; Butler, 'Birds of Indiana,' p. 77; Coues and Prentiss, 'Avifauna Columbiana,' p. 67; Merriam (Connecticut), *Trans. Conn. Acad.*, IV, p. 43; Trotter (vicinity of Philadelphia), *B. N. O. C.*, IV, p. 235; Lloyd (western Texas), *Auk*, IV, p. 294; Dutcher (Long Island), *ibid.*, VI, p. 137; etc.

Robin locally far north where the snow covers the ground for months dispels, too, all idea that its absence is due to removal wholly to the southward.

Cold and warmth apparently affect only the winter migratory movements of isolated communities, not otherwise controlling location in any particular locality in the normal winter range. For example, Bewick's Wren may be rare here during December and January in a mild winter and quite common during a severe one, or the opposite may be true, in either case the species being fairly numerous during the height of migration. In the phenomenally mild winter of 1889-90 they were absent until the close of December when a slight movement occurred, apparently the advance of an isolated community from below, for there was unmistakable northward movement in other species. The height of its migration was reached in March as in ordinary years. The sudden influx of Robins in the early part of January, 1887 (Auk, IX, p. 29) with the coming of snow, and their disappearance on the return of milder weather seems to have been an instance of migratory movement of a large community from above, for the regular northward migration took place at the usual time. Severer December and January snows, too, have failed, before and since, to occasion such intrusions. It is a curious fact that migration should take place in the Robin with the advent of snow at the South while flocks remain during the entire winter "in the valleys among the White Mountains, where snow covers the ground from October to June, and where the cold reaches the freezing-point of mercury" (Brewer, *Hist. N. A. Birds, Land Birds*, I, p. 26).¹ The explanation I would offer is, that the birds which visited us had been residing below the snow-line and were dependent on account of their great numbers chiefly upon the ground for food, and when the ground was covered by snow, they had no alternative but to remove southward and await its disappearance. The closing words, which I have omitted, in the quotation just cited, "attracted by the abundance of berries," explain their presence in New Hampshire.

Food as bearing upon the location of isolated communities remains to be considered. In 'off years' of species whose absence is attributed to variability in location of such communities there has

¹ See Auk, VIII, p. 317, for instance of Robins wintering in numbers in Quebec.

been no visible failure of food in this locality. The winter migratory movements of the Robin prove that a host may find ready subsistence where few or none have been previously sojourning. It is evident that abundance of food alone does not insure presence. When limited in numbers only a small area can be thickly inhabited, no matter how inviting the surrounding region may be. As some place must be selected when birds are not sufficiently abundant to populate the whole region temporarily available for residence, choice is made, though it may be a temporary one, as is the case in the Red-winged Blackbird here locally in winter, or it may be more permanent, as in the Robin, here in summer, or, in a smaller way, as in the Prairie Horned Lark (Auk, VIII, pp. 57, 58). Below the territory where snow is frequent, there must be wide opportunity for selection, but where the ground is covered for a long time, only such places as afford food on trees, etc., can be inhabited.

The absence of the Red-headed Woodpecker in Lewis County in northeastern New York (Merriam, B. N. O. C., III, p. 124) in winters when there were no beechnuts left on the trees, is a circumstance bearing directly upon this point. That this Woodpecker should winter in numbers, locally, in New York, even in the severest seasons, and in Vermont (Knowlton, B. N. O. C., VII, p. 63), and be absent here from October to April for successive years, may seem singular. In the abandonment of this locality in winter, however, it does not present any different feature than is exhibited in the Robin. The literature abounds in references to the erratic distribution and movements of this Woodpecker. The explanation appears simple. It is a bird that is distributed in isolated communities, and the communities vary in location, in the adjustment localities remaining untenanted for a varying period. Its absence in this vicinity in winter is understood to signify that the summer residents have departed, that the migrants have passed on, and that winter birds have centred elsewhere. Scarcity or abundance in summer is explained by shifting of position of breeding communities, and in the height of migration, by variation of lines of movement.

With the exception of the Dickcissel, the irregular breeding and winter birds mentioned above have been of habitual occur-

rence during the height of their migration. There are other birds that are uncertain in migration as well as at other seasons, as the Red-breasted Nuthatch here and the American Crossbill in the lower part of the State (Wayne, Auk, IV, pp. 287-289). This inconstancy seems attributable to a shifting of the lines of movement so that these localities are reached in some years and not in others. Both species are of local distribution in the breeding season here at the South, being confined apparently to the higher mountains. The irregularity reported by Dr. Cooper (Proc. U. S. Nat. Mus., II, p. 243) in Lawrence's Goldfinch, Lazuli Bunting, and Western Bluebird seems but further illustration of variability in location of isolated communities. Additional instances in Chester County in winter appear to be afforded in the Short-eared Owl, Purple Finch, Pine Siskin, Towhee, Palm Warbler, and Brown Creeper. In the breeding season the tendency to variability is not so great as in winter; witness the Robin in this locality. The Passenger Pigeon exemplifies variability in a high degree. Where there are great numbers food doubtless enters as an immediate factor in their movements, their erratic mode of migration being accentuated by necessity of continually seeking new feeding grounds. Fear of persecution probably causes them to avoid many localities, particularly in the location of their 'nestings.'

Where there has been no great change wrought in the face of a region, it is an open question whether much of the alleged extension of range of birds may not be simply shifting of isolated communities within ordinary limits of habitat.

Summary.—In species of uncertain occurrence in the height of migration, irregularity in breeding or winter residence that cannot be attributed to severity or mildness of season or to failure of food is ascribed to variation in lines of movement (facilitated by local distribution), the migration being regularly performed, but routes varying so that the same localities are not visited every season; in species of habitual occurrence in the height of migration, such irregularity is ascribed to variation in location of isolated communities at extremes of habitat—the birds in both cases not being sufficiently abundant to populate the whole region embraced within their range, thus necessitating choice of abode, which often results in absence in localities that have been favored in other seasons.

The abrupt occurrence in the depth of winter of a species that subsequently appears in greater numbers in the height of northward migration is imputed to migratory movement of an isolated community, the birds coming from the north if cold and from the south if warm.

(*To be concluded.*)

DESCRIPTIONS OF FIVE NEW BIRDS FROM MEXICO.

BY E. W. NELSON AND T. S. PALMER.

Megascops pinosus, sp. nov.

Type No. 131517, ♂ juv., U. S. National Museum, Department of Agriculture Collection, from Las Vigas, Vera Cruz, Mexico, June 9, 1893. Collected by E. W. Nelson. (Original No. 1235.)

Measurements: Wing, 132 mm. (5.20 in.); tail 61.5 mm. (2.38 in.); tarsus, 28 mm. (1.18 in.).

Color.—Crown including ear tufts, neck and back, with upper tail coverts, dark clove brown obscurely mottled and faintly barred with dull cinnamon with faint traces of dull grayish. About the neck behind is a narrow collar in which the feathers are distinctly barred with grayish and dull cinnamon. Feathers of chin, cheeks, ear coverts, lores and sides of forehead grayish white irregularly and finely barred and mottled with blackish brown. Entire lower surface except chin barred with grayish white and clove brown, the white bars being shaded or washed in part, particularly along the flanks; with pale cinnamon. In many instances the brown bars are connected by fine shaft-lines of brown which do not affect the general pattern. The barring on the throat and upper breast is finer or narrower than elsewhere. The rest of under surface has the alternate light and dark bars, three of each on each feather, of equal width and strongly contrasted. This produces a strong pattern of coarse light and dark barring which is quite unlike that of any other member of this group known to us. The feathering of feet and tarsus is dull grayish mottled with dark brown. Toes scantily feathered. Quills clove brown with a series of light, semi-circular and subquadrate spots along margin of

outer web. Near the base of outer quills these spots are nearly pure white on some feathers becoming cinnamon toward the tips. On inner quills they are all dull cinnamon. Secondaries and tertials clove brown with dull cinnamon bars on outer webs, most of these bars being mottled with the ground color of the feathers. On inner vanes of quills and secondaries the pale spots on outer vanes are matched by indistinct light bars. This mottling mixed with gray extends over most of the surface of innermost tertials. Large quill of alula bordered with a fine white edging connecting three pure white spots on outer web. Both webs of second quill of alula and inner web of larger quill with three spots of dull cinnamon. Lesser and middle coverts smoke brown with faint mottling of cinnamon. Greater coverts clove brown bordered along outer vane by mottling and spots of grayish and dull cinnamon. Tail, color of quills, narrowly barred with broken lines and mottling of pale cinnamon.

Unfortunately the only specimen of this bird in the collection is immature. It is very different in the character of its markings from the young of any other known *Megascops*. The specimen was killed in the pines at the northeast base of the Cofre de Perote near Las Vigas, in Vera Cruz, at an altitude of over 8,000 feet.

Megascops ridgwayi,¹ sp. nov.

Type No. 131518, U. S. National Museum, Department of Agriculture Collection, from Patzcuaro, Michoacan, Mexico, July 23, 1892. Collected by E. W. Nelson. (Original No. 218, sex unknown.)

Measurements (taken from dry skin): Wing, 146 mm. (5.75 in.); tail, 65 mm. (2.55 in.); tarsus, 30.5 mm. (1.20 in.).

Color.—Entire top and sides of head and neck, back and rump, dull cinnamon-rufous. Feathers of crown and back streaked with narrow shaft-lines of blackish with faint indications of transverse mottling or bars. The quills, secondaries and tertials are hair-brown with rows of sub-quadrant spots along the outer webs not quite reaching to the shaft. These spots are a little longer than broad and are about the same color as the back except on the quills and about the bend of the wing where they become paler and are almost white in a few places. The inner webs of the quill feathers are crossed by faintly marked bars of lighter shade, matching the spots on outer web. On the inner webs of secondaries and

¹ We take pleasure in dedicating this species to Mr. Robert Ridgway, Curator of Birds in the U. S. National Museum, to whom we are indebted for many courtesies.

tertiaries these inner web bars are paler, becoming ochraceous-buffy along the inner border of the vane. Scapulars, color of back with a large ovate whitish spot extending obliquely back across outer web of feather near tip and encroaching on the inner web as a point. Lesser and middle coverts very dark cinnamon-rufous with broad heavy shaft streaks of blackish. Lores grayish with hairs black-tipped. Extending back from lores on sides of forehead over each eye is a series of feathers having large median white spots narrowly bordered with darker. Cheeks cinnamon rufous. Ear coverts grayish, edged with cinnamon rufous and tipped with blackish. Feathers of chin whitish; throat feathers with broad blackish shaft-lines along entire length bordered on each side by dull pale cinnamon. Breast dull, dark cinnamon-rufous faintly mottled with darker. Feathers of the adult plumage coming in here are heavily marked with a broad shaft-streak occupying one-third of the feathers. Remainder of lower surface very pale cinnamon with faint hoary gray and dark mottling. Feathering of legs and feet dull pale buffy. Tail feathers hair-brown broadly washed along outer web and about tips with cinnamon-rufous. A mottling of the same color crosses the feathers forming irregular broken bars.

This species is smaller than *Megascops asio floridanus* and agrees very closely in size with *M. cassini* from the vicinity of Jalapa and Mirador in Vera Cruz, eastern Mexico, but is readily distinguishable from it by the scantily feathered toes. The type is a full grown young in the red phase. It was killed in the pines at an altitude of 8500 feet. Two adults of this species, in the gray phase, were seen at Patzcuaro, where they were kept as pets in a store, but the owner refused to part with them.

Glaucidium fisheri,¹ sp. nov.

Type No. 131519 ♀, U. S. National Museum, Department of Agriculture Collection. From Tochmilco, Puebla, Mexico. Collected by E. W. Nelson August 7, 1893. (Original No. 1454.)

Measurements: Length of wing, 87.6 mm. (3.45 in.); tail, 59.6 mm. (2.35 in.); tarsus, 19.3 mm. (.76 in.); chord of culmen, 8.9 mm. (.35 in.).

Color.—Back bistre brown with a warm tinge of vandyke. Top of head and occiput hair-brown with a faint tinge of bistre. The forehead and fore part of crown including most of the interorbital area is marked with shaft streaks of white. Along the sides of the crown extending

¹ Named in honor of Dr. A. K. Fisher, in recognition of his valuable work on the Hawks and Owls of the United States.

back to the nape are numerous concealed white spots. The feathers of median part of crown and occiput are plain to the base or with extremely fine concealed shaft-lines of white. There is a narrow nuchal collar of feathers having concealed white spots with brown and blackish edgings. Scapulars bistre-brown like the back but with a few small concealed spots of dull cinnamon. Primary coverts sepia-brown with cinnamon spots and edgings at tips. Quills dark clove-brown with a few marginal spots of dull cinnamon and crossed by faint narrow bars of lighter ending in subquadrate whitish spots on their inner webs. Tail uniform in color with the wings and marked by a series of seven white spots along each border of the middle tail feathers; all of these spots are shaded about their border by a tinge of dull cinnamon. On the two or three outer pairs of tail feathers these spots become very small, giving the appearance of broken bands or bars across the tail. Upper tail coverts like back with mottling of dull cinnamon. Feathers of lores white at base but black on the hair-like distal two thirds. A very narrow whitish border on eyelids. The feathers on sides of the face, including ear-coverts are hair-brown below the eyes, and mottled with blackish-brown, dull cinnamon and whitish over the ears. A very narrow series of white feathers on the chin are continuous with the well marked white malar stripe which reaches back on each side to beneath the ear. The hair-brown color of the crown extends forward to the sides of the throat below this white bar. On each side of the breast is an area of brown slightly paler than the back and continuous with a narrow collar of the same color which margins the brown area of the back in front. Across the chin and back along sides of the throat there is a narrow line of feathers hair-brown at base and pale cinnamon at tip forming a thin band uniting the brown areas on the sides of the breast. Throat and middle line of breast white. Rest of lower parts white heavily streaked with brown; these streaks being similar in shade to the back, along the fore part of the flanks, but elsewhere, much darker sepia-brown. Feathers on front of thighs are dull cinnamon; elsewhere on legs they are white except for a fine mottling of dingy hair-brown on front of tarsus. Under wing-coverts yellowish white. Border of shoulder on under side pale cinnamon sparsely streaked with dark brown. Bill greenish-yellow at tip, horn color at base. Claws black at tip, horn color at base.

General characters.—Size small; somewhat similar to *Glaucidium cobanense* but differing from it in the bistre-brown instead of rufous plumage; color of the head distinct from that of the back; forehead marked with shaft-streaks of dull white extending back to nuchal collar as concealed spots instead of the obscure bars of brighter rufous of *G. cobanense*. The latter species is described as being almost uniform rufous while in *G. fisheri* the back is bistre-brown tinged with vandyke in marked contrast with the hair-brown of the top of the head.

Glaucidium cobanense was described by Sharpe¹ from an examination of six specimens from Vera Paz, Guatemala, no one of which seems to have been designated as the type. The measurements of the type of *G. fisheri* and four of the specimens of *G. cobanense* are given below:—

	Wing.	Tail.	Tarsus.
<i>Glaucidium fisheri</i>			
♀ Tochimilco, Puebla, Mexico	3.45	2.35	.76
<i>Glaucidium cobanense</i>			
Ad., Laguna, Vera Paz, Guatemala	3.90	2.70	.85
Ad., El Paraiso, Vera Paz, Guatemala	4.10	2.70	.80
“ “ “ “ “	3.90	2.75	.80
Juv., Volcan de Fuego, Vera Paz, Guatemala	3.55	2.75	.75

On page 199 of the 'Catalogue of the Striges in the British Museum,' are given the following additional measurements for this species: Wing, 3.45; tail, 2.55; tarsus, .75. These are evidently taken from a specimen from Coban, Vera Paz, obtained from M. A. Bouvier—one of those referred to in the original description. From these measurements it will be seen that the specimen of *G. fisheri*, although a female, is only as large as the smallest specimen of *G. cobanense* and appreciably smaller than the average measurements of five specimens of the latter species.

The type and only known specimen of this handsome little Owl was shot from a ledge of rocks where it had taken refuge from a passing shower. It was found among the oaks and pines on the southeast slope of Mount Popocatepetl at an altitude of about 6500 feet, near the town of Tochimilco in the state of Puebla.

Aimophila rufescens pallida, subsp. nov.

Type No. 131516 ♀, U. S. National Museum, Department of Agriculture Collection, from Etzatlan, Jalisco, Mexico, June 16, 1892. Collected by E. W. Nelson. (Original No. 180.)

Measurements (of dried skin): Wing, 75 mm. (2.95 in.); tail, 71 mm. (2.80 in.); tarsus, 25 mm. (1.00 in.); culmen, 17.5 mm. (.69 in.).

¹ Ibis, 3d ser., V, 1875, pp. 47-49, 260.

This new subspecies may be recognized by its generally paler colors in comparison with typical *rufescens* from near the type locality, Temiscaltepec in the state of Mexico. Numerous other specimens of this bird from Jalapa to the City of Orizaba, in Vera Cruz, are also typical in coloration. The following detailed comparison shows the most marked characters separating the two forms. It may be noted here that the plate of *Hæmophila rufescens* in the 'Biologia Centrali-Americana' is an excellent representation of the typical *rufescens*.

A. rufescens.

Crown dark rufous or chestnut with a distinct but irregular ashy median stripe, and with a blackish border on each side.

Lores dark gray.

Superciliary stripe white, washed with fulvous from nostril back to eye; over and back of eye along side of crown clear dark ashy.

Post-ocular streak blackish with very dark rufous edgings to feathers.

Back dark chestnut with distinct although small, black shaft-streaks near ends of feathers.

Chin, throat and malar stripe white, washed with fulvous.

Sides of neck and body olive gray washed with fulvous, becoming warm bistre brown on the flanks.

Under mandible pale yellowish horn color.

A. rufescens pallida.

Crown pale rusty rufous, the median ashy streak obsolete and the dark border on each side of crown merely indicated by a darkening of the rufous of the center.

Lores ashy.

Superciliary stripe white from nostril to eye, thence back along crown dingy ashy.

Post-ocular streak much lighter and more rufous than in typical birds.

Back paler with the dark shaft-streaks nearly obsolete.

Chin, throat and malar stripe white.

Sides of neck and body pale olive gray, much ashier than in typical birds, becoming somewhat warmer and browner on the flanks.

Under mandible dark bluish horn color.

Typical *A. rufescens* is a bird of the damper parts of eastern and southern Mexico; the present form comes from Etzatlan,

Jalisco, on the more arid southwestern border of the tableland region.

Sitta carolinensis mexicana, subsp. nov.

Type No. 131515 ♂, U. S. National Museum, Department of Agriculture Collection, from Mt. Orizaba, Puebla, Mexico, April 26, 1893. Collected by E. W. Nelson. (Original No. 1104.)

Measurements (taken from dry skin): Wing, 89 mm. (3.50 in.); tarsus, 19 mm. (.75 in.); culmen, 19.3 mm. (.76 in.); bill from nostril, 13 mm. (.52 in.).

Color.—Above similar to *Sitta carolinensis aculeata* including the dark markings on the tertials. Under surface decidedly ashy. Flanks dull bluish gray nearly concolor with the middle of the back.

The White-bellied Nuthatches from the mountains of south-central Mexico present certain characteristics by which they may be distinguished from either of the two recognized forms of the United States. The Mexican bird has a beak averaging rather smaller than that of *Sitta carolinensis* from the eastern United States. With this character it combines the color of the dorsal surface and dark markings on tertials of *S. aculeata*, and differs from both northern forms in having only the chin and throat pure white—the rest of the lower parts in the present form being washed with a distinct ashy shade, heaviest on the flanks and posteriorly.

This new race is a common breeding resident on Mt. Orizaba in Puebla and also in the high mountains about the Valley of Mexico, and is found thence westerly along the Sierra Madre at least to the Volcano of Colima. It was also seen in the mountains of Hidalgo. Beyond this the work has not extended far enough to determine the limits between it and the other forms.

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

BY ORDER of the Council of the American Ornithologists' Union the Committee on Classification and Nomenclature of North American Birds has prepared the following report on the species, subspecies, and changes of nomenclature proposed during the year ending November, 1893, forming the Sixth Supplement to the American Ornithologists' Union Check-List. The Committee met in Cambridge, Nov. 21-23, 1893, with the following members present: Allen, Brewster, and Merriam. On all but one question the vote was unanimous.

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

Committee	{	ELLIOTT COUES, <i>Chairman.</i>
		J. A. ALLEN.
		WILLIAM BREWSTER.
		C. HART MERRIAM.
		ROBERT RIDGWAY.

I. ADDITIONS.

305 *a.* ***Tympanuchus americanus attwateri*** (BENDIRE).

Attwater's Prairie Hen.

Tympanuchus attwateri BENDIRE, Forest and Stream, XL,
No. 20, May 18, 1893, 425.

Tympanuchus americanus attwateri BENDIRE, MS.

[B 464, *part*, C 384, *part*, R 477, *part*, C 563, *part*.]

HAB. Coast region of Louisiana and Texas.

373 *g.* ***Megascops asio aikeni*** BREWST.

Aiken's Screech Owl.

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

[B—, C—, R—, C—.]

HAB. Plains, El Paso County, Colorado, south probably to central New Mexico and northwestern Arizona.

373 *h.* *Megascops asio macfarlanei* BREWST.

MacFarlane's Screech Owl.

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

[B 49, *part*, C 318, *part*, R 402, *part*, C 465, *part*.]

HAB. East of the Cascades in Washington, interior of southern British Columbia, and eastward into Montana.

567 *d.* *Junco hyemalis pinosus* LOOMIS.

Point Pinos Junco.

Junco pinosus LOOMIS, Auk, X, April, 1893, 47.

[B—, C—, R—, C—.]

HAB. Vicinity of Monterey, California.

725 *c.* *Cistothorus palustris griseus* BREWST.

Worthington's Marsh Wren.

Cistothorus palustris griseus BREWST., Auk, X, July, 1893, 216.

[B 268, *part*, C 51, *part*, R 67, *part*, C 79, *part*.]

HAB. Coast region of South Carolina and Georgia.

740 *b.* *Parus hudsonicus columbianus* RHOADS.

Columbian Chickadee.

Parus hudsonicus columbianus RHOADS, Auk, X, Jan. 1893, 23.

[B 296, *part*, C 33, *part*, R 45, *part*, C 49, *part*.]

HAB. Rocky Mountains, from the Liard River south into Montana.

II. CHANGES OF NOMENCLATURE.

320. **Columbigallina passerina** (LINN.). This becomes **Columbigallina passerina terrestris** CHAPM.

Columbigallina passerina terrestris CHAPMAN, Bull. Am. Mus. Nat. Hist., IV, 1892, 292.

The type of *C. passerina* came from the Island of Jamaica and is subspecifically separable from the bird of the southeastern United States.

341. **Buteo albicaudatus** VIEILL. This becomes

341. **Buteo albicaudatus sennetti** ALLEN.

Sennett's White-tailed Hawk.

Buteo albicaudatus sennetti ALLEN, Bull. Am. Mus. Nat. Hist., V, 1893, 144.

HAB. Rio Grande Valley, Texas, and southward into Mexico.

417 a. **Antrostomus vociferus arizonæ** BREWST. This becomes

Antrostomus vociferus macromystax (WAGLER).

Caprimulgus macromystax WAGLER, Ibis, 1831, 533.

Caprimulgus vociferus macromystax HARTERT, Ibis, 1892, 286.

Cf. HARTERT, l. c.

494 a. **Dolichonyx oryzivorus albinucha** RIDGW. This becomes a synonym of *Dolichonyx oryzivorus* (LINN.). (Cf. CHAPMAN, Auk, X, Oct. 1893, 311.)

GENUS **Campylorhynchus** SPIX (p. 325). This becomes

GENUS **Heleodytes** CABANIS.

Heleodytes CABANIS, Mus. Hein. I, 1850, 80. Type *Furnarius griseus* SWAIN.

Campylorhynchus SPIX, 1824, is preoccupied in Coleoptera by *Campylirhynchus* MEGERLE, 1821. (Cf. PALMER, Auk, X, Jan. 1893, 86.) Hence Nos. 713 and 714 will stand as follows:—

713. **Heleodytes brunneicapillus** (LAFR.).

714. **Heleodytes affinis** (XANTUS).

III. FORMS CONSIDERED AS NOT ENTITLED TO
RECOGNITION.

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

Considered as a synonym of *Megascops asio kennicottii* (ELLIOT), the range of variation in a large series of specimens of *M. a. saturatus* covering all of the alleged distinctive features of the supposed unique type of *M. a. kennicottii*, the range of which latter is now extended southward over the supposed habitat of *M. a. saturatus*.

Parus hudsonicus ungava RHOADS, Auk, X, Oct., 1893, 328.

Considered as not separable from *Parus hudsonicus* FORST., owing to the insufficiency of the alleged characters. It was tentatively proposed, and confessedly without comparison with specimens of *P. hudsonicus* from any point near the type locality of the species.

Parus hudsonicus evura COUES (Key N. Am. Birds, 1884, 267). (Cf. RHOADS, Auk, X, Oct., 1893, 331.)

Considered as inseparable from *Parus hudsonicus* FORST.

IV. PROPOSED CHANGES OF NOMENCLATURE
REJECTED.

Conuropsis vs. *Conurus*, and hence *Conuropsis carolinensis* vs. *Conurus carolinensis*. (Cf. SALVADORI, Cat. Birds Brit. Mus. XX, 1891, 203.)

The type of *Conurus* (LESSON ex Kuhl) is considered to be *Psittacus carolinensis* Gm., as originally determined by the A. O. U. Committee by the principle of elimination (cf. Canon XXIV, A. O. U. Code of Nomenclature). *Conuropsis* SALVADORI, based on this species, becomes therefore a synonym of *Conurus*.

Corvus americanus caurinus (BD.) vs. *Corvus caurinus* BD.
(Cf. RHOADS, Auk, X, Jan. 1893, 18-21.)

The proposed change was not considered expedient, the case being deemed not well enough understood to warrant any change.

Melospiza lincolni (AUD.) vs. *Melospiza lincolni striata* BREWST. (Cf. RHOADS, Auk, X, Jan. 1893, 21; Proc. Acad. Nat. Sci. Phila. 1893, 51.)

The proposed change was not adopted, *M. l. striata* being considered as entitled to recognition as a local northwest-coast form.

Vireo gilvus swainsoni (BD.) vs. *Vireo gilvus* (Vieill.).
(Cf. RHOADS, Auk, X, Jan. 1893, 21; Proc. Acad. Nat. Sci. Phila. 1893, 53.)

The type of *Vireo swainsoni* BD. came from Petaluma, California, instead of from Steilacoom, Washington, as represented (l. c.). Furthermore, in view of the instability of the *Vireo gilvus* group as represented in different parts of North America, and the tendency to development of slightly differentiated local forms, it was deemed unnecessary to recognize any of them in nomenclature.

Sylvania pusilla (WILS.) vs. *Sylvania pusilla pileolata* (PALL.). (Cf. RHOADS, Auk, X, Jan. 1893, 23; Proc. Acad. Nat. Sci. Phila. 1893, 55.)

The proposed change was not considered necessary, the material submitted to the Committee showing that true *Sylvania pusilla* is found in Vancouver Island.

V. ACTION DEFERRED.

Final action on the following was deferred.

Leptoptila brachyptera (SALVADORI ex GRAY) vs. *Engyp-tila albifrons* (BONAP.). (Cf. SALVADORI, Cat. Birds Brit. Mus. XXI, 1893, 545.)

Owing to complications of synonymatic and other questions involved, final decision was deferred.

Chordeiles acutipennis texensis (LAWR.) vs. *Chordeiles texensis* LAWR. (Cf. HARTERT, Cat. Birds Brit. Mus. XVI, 1892, 616.)

Deferred for later consideration, owing to last of material for examination.

Icterus gularis yucatanensis BERLEPSCH. (Cf. BENDIRE, Auk, X, Oct. 1893, 366.)

While there is no doubt of the capture of specimens as alleged, nor of the correctness of the identification, final action was deferred pending further investigations as to the possibility of their introduction through man's agency.

Vireo huttoni obscurus ANTHONY (Zoe, Dec. 1890, 307. Cf. also RHOADS, Auk, X, July, 1893, 239).

Deferred for later consideration, owing to lack of material for examination.

Vireo huttoni insularis RHOADS (Auk, X, July, 1893, 239).

Deferred for later consideration, owing to lack of sufficient material for examination.



ELEVENTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE ELEVENTH CONGRESS of the American Ornithologists' Union was held in Cambridge, Mass., Nov. 20-23, 1893. The three days' open session of the Union were preceded by a business meeting held at the residence of Mr. C. F. Batchelder on the evening of November 20. The open session, to which the public was invited, was held in the Nash Lecture-room of the Harvard University Museum.

BUSINESS SESSION.—In the absence of the President, Dr. Elliott Coues, who was unfortunately unavoidably detained in the West, the meeting was called to order by Vice-President William

Brewster. The report of the Secretary showed that during the year the Union had lost fifteen members,— six by death and nine by resignation, all from the Associate List. The members lost by death were as follows: Jenness Richardson,¹ who died at Bryn Mawr, N. Y., June 24, 1893, aged 36; Erastus Corning, Jr., who died at Albany, N. Y., April 9, 1893, aged 41; Benj. F. Goss,² who died at Pewaukee, Wis., July 6, 1893, aged 70; Austin F. Park,³ who died at Troy, N. Y., Sept. 22, 1893, aged 68; Charles Slover Allen, M. D.,⁴ who died in New York City, Oct. 15, 1893, aged 39.

The Secretary also presented as a part of his report the following interesting tables showing how steadily, both in membership and attendance, the Union has grown. For comparison the attendance at the Eleventh Congress is also included.

STATUS OF MEMBERSHIP AT THE OPENING OF EACH CONGRESS.

	ACTIVE.	HONORARY.	CORRESPONDING.	ASSOCIATE.	TOTAL.
1883— 1st Congress, New York.	23				23
1884— 2d “ “	44	20	16	63	143
1885— 3d “ “	47	25	65	64	201
1886— 4th “ Washington.	45	25	69	112	251
1887— 5th “ Boston.	46	25	70	143	284
1888— 6th “ Washington.	45	25	67	161	298
1889— 7th “ New York.	49	25	68	258	400
1890— 8th “ Washington.	50	21	72	322	465
1891— 9th “ New York.	47	22	72	352	493
1892— 10th “ Washington.	45	22	74	416	557
1893— 11th “ Cambridge.	48	22	73	439	582

¹ For an obituary notice, see Auk, X, 1893, p. 304.

² For an obituary notice, see *Ibid.*, p. 385.

³ For an obituary notice, see *Ibid.*, p. 384.

⁴ For an obituary notice, see the present number of 'The Auk', under 'Notes and News.'

ATTENDANCE AT EACH CONGRESS.

	ACTIVE.	HONORARY.	ASSOCIATE.	TOTAL.
1883— 1st Congress, New York.	21	.		21
1884— 2d “ “	16	2	4	22
1885— 3d “ “	16		6	22
1886— 4th “ Washington.	20		11	31
1887— 5th “ Boston.	17		12	29
1888— 6th “ Washington.	20		17	37
1889— 7th “ New York.	20		32	52
1890— 8th “ Washington.	20		18	38
1891— 9th “ New York.	14		32	46
1892— 10th “ Washington.	20		24	44
1893— 11th “ Cambridge.	17		36	53

The report of the Treasurer showed a considerable balance in the treasury of the Union.

The officers and councillors of the preceding year were re-elected. Eighty-four Associate Members were elected, but no additions were made to either the Active, Corresponding, or Honorary lists. The usual reports of Committees were received.

PUBLIC SESSION. *First day.* — The meeting was called to order by Vice-President William Brewster, and after an address of welcome of Prof. George L. Goodale on behalf of Harvard University, at once proceeded to the consideration of Scientific Papers.

The morning session was devoted to two papers on bird migration, the first by Leverett M. Loomis, entitled ‘Bird Migration in Chester County, South Carolina, viewed with Reference to Cause’; the second by Frank M. Chapman, entitled ‘Remarks on the Origin of Bird Migration.’ Two parts of Mr. Loomis’s paper appear in this number of ‘The Auk’ (pp. 26–39). The author summarized these parts and gave in detail the third and concluding part. Mr. Chapman’s paper is published in full (*antea*, pp. 12–17).

These papers were discussed by Mr. D. G. Elliot, Mr. Francis, Prof. John Macoun, Dr. C. Hart Merriam, Mr. Loomis, and Mr. Chapman.

The first paper of the afternoon session was by D. G. Elliot on 'The Survival of the Fittest.' It was discussed by Dr. C. Hart Merriam, Dr. J. A. Allen, and Mr. Elliot.

The concluding paper of the day was by Mr. William Dutcher on 'The Labrador Duck — Another specimen with some additional data respecting extant specimens' (published *antea*, pp. 4-12). Discussion followed by Messrs. D. G. Elliot, C. F. Batchelder, M. Chamberlain, A. C. Bent, E. W. Nelson, Capt. Charles Bendire, Prof. John Macoun, Dr. C. Hart Merriam, and the author.

Second day's session.—The meeting was called to order by Vice-President William Brewster. The morning session was given to the presentation of two papers by Dr. J. A. Allen entitled 'Protective Coloration and Natural Selection,' and 'Protective Mimicry.' These papers were discussed at length by Messrs. D. G. Elliot, William Brewster, Dr. C. Hart Merriam, and Dr. Allen. The first paper particularly appealed to the individual experience of many of the members in attendance and the whole day's session might have been profitably given to a presentation of their views.

The afternoon was devoted to a paper by Frank M. Chapman on 'The Island of Trinidad and its Bird-Life, Illustrated with Lantern Slides.' Many pictures were shown of characteristic forest scenes and birds.

Third day's session.—The meeting was called to order by ex-President, D. G. Elliot. Before proceeding to the reading of papers, the Committee on Resolutions presented the following report:—

"*Resolved:* That the thanks of the American Ornithologists' Union be and hereby are tendered to Prof. George L. Goodale for the use of the Nash Lecture-room of Harvard University as a place of meeting for the Union and for other courtesies extended.

"*Resolved:* That the thanks of the American Ornithologists' Union be and hereby are tendered to the Nuttall Ornithological Club for its cordial welcome and generous hospitalities extended to visiting members.

"*Resolved:* That the thanks of the American Ornithologists' Union be and hereby are tendered to the Colonial Club of Cambridge for courtesies extended to the Union during its Eleventh Congress."

The first paper of the morning was by Mr. F. A. Lucas 'On the Tongue of *Dendroica tigrina*.' In the absence of the author it was read by Mr. F. B. White.

The second paper was by Dr. A. P. Chadbourne and was entitled 'Change in Feeding Habits of the Night Hawk since the general use of Electric Lights.' Remarks followed by Mr. Ruthven Deane.

The third paper was by the same author and described 'An Instance of Reasoning in the Scarlet Ibis.' The fourth paper was by Dr. Louis B. Bishop 'On the nest of *Cistothorus palustris*.' The fifth paper was by Mr. George H. Mackay on the 'Habits of the Double-crested Cormorant (*Phalacrocorax dilophus*) in Rhode Island' (published *antea*, pp. 18-24). It was read by Mr. William Dutcher and was discussed by Messrs. D. G. Elliot and E. H. Forbush. The sixth and last paper of the morning session was by Mr. E. W. Nelson and was entitled 'Some Mexican Notes.' The author gave a graphic description of the scenery and bird-life of the higher peaks at the southern border of the Mexican tableland.

The first paper of the afternoon session was by Mr. E. H. Forbush on the 'Capture of the Yellow-crowned Night Heron in Massachusetts.' The second paper was by Mr. Frank M. Chapman on 'General Impressions of Tropical Bird-life.' The third paper was by Dr. C. Hart Merriam who spoke informally of his recent trip to Wyoming.

At the conclusion of Dr. Merriam's remarks, the Union adjourned to meet at the American Museum of Natural History, New York City, November 12, 1894.

This was one of the most successful Congresses ever held by the Union. Many of the papers had a general bearing upon the leading biologic questions of the day and were therefore of interest to all students of natural history. That this fact was appreciated was shown by the unusual attendance of the public, the audiences sometimes reaching nearly 150, a number not approached at any previous meeting.

But the success of the Congress was not dependent alone upon its formal and official transactions. From the social standpoint the meeting was no less memorable. Cambridge is the home of the Nuttall Ornithological Club, the immediate

ancestor of the Union, and its members both individually and collectively gave a most cordial reception to the visiting organization. Each day of the session the Club entertained the Union at luncheon at the rooms of the Colonial Club, and on the evening of the 20th the members of both societies met by invitation at the residence of Mr. C. F. Batchelder and celebrated in an informal and thoroughly enjoyable way the twentieth birthday of the parent society.

RECENT LITERATURE.

Newton's 'Dictionary of Birds,' Part II.¹—The general character of Professor Newton's 'Dictionary of Birds' has already been indicated (Auk, X, pp. 357-360). Part II (Ga-Moa, pp. 305-576) contains, besides the definitions naturally to be expected, a number of especially noteworthy articles, as *Gare-Fowl* (pp. 303-308, concluded from Part I), *Geographical Distribution* (pp. 311-363), *Migration* (pp. 547-572), and *Mimicry* (pp. 572-575), some of which call for somewhat detailed notice. Among the other longer articles, which are noteworthy for their scope and varied information, are *Grouse* (6 pp.), *Guachero* (*Steatornis*), *Heron* (5 pp.), *Hoactzin* (*Opisthocomus*), *Hornbill* (5 pp.), *Hummingbird* (10 pp.), *Kiwi* (6 pp.), *Lark* (6 pp.), *Lyre-bird* (5 pp.), *Megapode* (4 pp.), etc.

In the twenty-five pages devoted to Migration, the general facts of the subject are set forth, and then an attempt is made to "account for the cause or causes of migration." "Want of food" is deemed to be "the most obvious cause," "far more so than variation of the temperature, though in popular belief that probably holds the first place." "As food grows scarce toward the end of summer in the most northern limits of the range of a species, the individuals affected thereby seek it elsewhere; in this way they press upon the haunt of other individuals," and so on. This, says Prof. Newton, "seems satisfactorily to explain the southward movement of many migrating birds in the northern hemisphere; but when we consider the return movement which takes place some six months later, doubt may be entertained whether scarcity of food can be assigned as its sole or suffi-

¹A Dictionary of Birds. By Alfred Newton. Assisted by Hans Gadow. With Contributions from Richard Lydekker, B. A., F. G. S., Charles S. Roy, M. A., F. R. S., and Robert W. Shufeldt, M. D. (late United States Army). Part II (Ga-Moa). London: Adam and Charles Black, 1893.—8vo., pp. 305-576.

cient cause, and perhaps it would be safest not to come to any decision on this point." It is suggested that the more equatorial regions may be "deficient in certain necessities for the nursery," and also that these same regions "would not supply sufficient food for both parents and offspring, the latter being, at the lowest computation, twice as numerous as the former, unless the numbers of both were diminished by the casualties of travel." On the other hand, in view of "the pertinacity with which birds return to their accustomed breeding-places," "the force of this passionate fondness for the old home" must be taken into account, "even if we do not allow that in it lies the whole stimulus to undertake the perilous voyage." Beyond these few suggestions, it is rather surprising to find little discussion of the 'causes' of migration.¹

The manner of migration is considered at some length, illustrated by the citation of a number of specific examples, and includes the discussion of routes of migration, the literature of the subject being liberally cited, either in the text or the accompanying foot-notes. The question—"How do the birds find their way so unerringly from such immense distances?" is considered to be "the most marvellous thing of all" and "by far the most inexplicable part of the matter." "Sight alone," our author thinks, "can hardly be regarded as affording much aid to birds—and there is reason to think that there are several such—which at one stretch transport themselves across the breadth of Europe, or even traverse more than a thousand miles of open ocean, to say nothing of those—and of them there are certainly many—which perform their migrations mainly by night." The fact is apparently lost sight of that even at night—at least in clear weather when birds mostly migrate—at the altitude at which birds ordinarily perform their journeys, the main features of the landscape are distinctly visible for long distances to the migrating birds, and that in reality "sight, and sight only, is the sense which directs these birds," as truly as in the case of 'homing' Pigeons, where it is admitted by "all the best authorities on that subject." In the case of birds traversing wide expanses of open sea, sight is perhaps aided by other factors, as notably the direction and temperature of the wind, combined with the fact that even when such flights are quite extended they are of comparatively short duration, being performed by birds that for the most part are exceptionally strong fliers, as many of the *Grallæ*, etc. Prof. Newton's idea that birds which perform their journeys by night cannot possibly be aided by sight is almost demonstrably erroneous, as any one who has spent a night on the summit of a high mountain and noted the distinctness with which the landscape is spread out below him, will readily believe.

In regard to the subject of Mimicry, we must confess surprise at finding so conservative and sensible a writer as Prof. Newton giving such unreserved support to this theory as his article on the subject shows.

¹ On this subject *cf.* Allen, *Auk*, X, pp. 102-104, and Chapman, *antea*, pp. 12-17.

He says: "Mimicry, with the prefix *unconscious*, which in every department of Zoology should be always expressed or understood, signifies the more or less complete likeness, in colouring or form or both, which one creature bears to another, so that in some cases one may easily be mistaken for the other, though the affinity between them may be very remote The explanation is simply that the weaker animal, or that which exists under less favorable conditions, 'mimics' the stronger, or that which is most flourishing, the mimicry being presumably effected by means of Natural Selection; but the difficulties which attend the investigation of the way in which this result is brought about, so as to render the explanation in all cases acceptable, are often extremely great, and one ought not to be surprised that some zoologists are unable to accept the explanation at all." As one of the conditions for an acceptable case of mimicry, as laid down by Wallace, is that the mimicker and the form mimicked must both share the same habitat, Prof. Newton finds it convenient to cite only about three or four good examples among the class of birds,—that of "a Cuckoo to a Hawk," that of *Mimeta* (a genus of Orioles) to *Philemon* (a genus of Friar-birds), that of *Harpagus diodon* to *Accipiter pileatus* (a very weak case), and that of the genus *Tylas* to *Xenopirostris*. None of them very fully meets the conditions of a good case of mimicry, since the advantages secured by the supposed mimicry are by no means very obvious. The most that can be said is that the two forms which present a somewhat striking superficial resemblance to each other happen in each case to occupy a common habitat. A large number of other cases might be cited were it not for their dissimilarity in distribution, and a number of such are mentioned *passim* in the 'Dictionary,' as *Agapornis* and *Psittacula*, *Alamon* and *Upupa*, *Sturnella* and *Macronyx*, *Seriflophus* and *Ampelis*, *Colaptes* and *Geocolaptes*, etc., while the list could easily be greatly extended. Hence our author feels called upon to caution his readers to bear in mind "that all cases of close similarity of plumage are not necessarily Mimicry." There is not space here to discuss the subject at length (as we hope to do later in some other connection), but it may be well to suggest that there is another side to the question, and that there are other explanations of these resemblances that seem more reasonable. In fact in most instances, and at least so far as birds are concerned, it seems by no means rash to consider them as purely accidental, or cases of coincidence.¹

The article on 'Geographical Distribution' is an admirable presentation of the subject, although on minor points we should find it somewhat difficult to subscribe to all of our author's conclusions. We notice, with some surprise, the absence of any discussion of the causes, past or present, of the distribution of avine life, except incidentally in one or two cases. It may be noted that a number of important departures are made from the

¹ See further the discussion of 'Mimicry' in Beddard's 'Animal Coloration,' and the evidence and authorities, pro and con, there cited.

Scclaterian system, of which formerly Prof. Newton was a loyal adherent. Thus the Palæarctic and Nearctic Regions of Scclater are combined to form a single circumpolar area, under the name 'Holarctic Region,' while New Zealand, in accordance with Prof. Huxley's scheme, is separated from Scclater's Australian Region to form a 'New Zealand Region.' Prof. Newton's "six primary regions" are: (1) the *New Zealand Region*, (2) the *Australian Region*, (3) the *Neotropical Region*, (4) the *Holarctic Region*, (5) the *Ethiopian Region*, (6) the *Indian Region*. Each of these, except the first, is divided into a number of 'subregions,' and some of these into 'provinces,' of which lack of space here forbids a detailed notice. A map of the world accompanies the article, showing approximately these six zoögeographical Regions.

Respecting the Holarctic Region, however, we may quote as follows: "As has been stated in the introductory portion of this article, the combination intimated by this phrase [the Holarctic Region], though sanctioned in spirit by Prof. Huxley, wholly contravenes the opinion expressed by two of the leading authorities on the subject — Messrs. Scclater and Wallace. The arguments of the former being based on positive facts, or at least on what seemed at the time to be such, must be met by corresponding facts. Those of the latter having a more hypothetical foundation — the notion that each of the primary divisions of the earth's surface should comprehend about the same extent — require less consideration. The natural philosopher regards quality rather than quantity, and things must be weighed as well as measured, analyzed as well as surveyed. . . . But not to wander from our present business, no one who will investigate the Avifauna of that part of North America lying outside the boundary (if it can ever be traced) of the Neotropical Region, will find in the Nearctic area more than a single family of Birds [Chamæidæ] that is peculiar to it, and that is a family of position so doubtful that some of those who have most closely studied it refer it to one or another of well-known families — *Paridæ* or *Troglodytidæ* — both of which are widely dispersed and admittedly contain genera that differ considerably. . . . Every other Nearctic family is common to the Neotropical Region or to the Palæarctic area, or to both. Thus regarded from every ornithological aspect, what has been called the Nearctic 'Region' has no right to be so accounted, since its peculiarity is numerically of less importance than some of the Subregions of the Neotropical Region. . . ."

In discussing these several regions Prof. Newton brings into strong relief their chief characteristics, and especially the prevalence of weak, isolated and ancient ornithic types in New Zealand, and to a less degree in Australia, and their greater prevalence in South America than in any other part of the world except in Australia and New Zealand. On the other hand, the "Holarctic Region seems to have the most highly developed Fauna, in that it is one from which the weakest types have generally been eliminated, though that result is chiefly seen in its Palæarctic area, and perhaps especially in the western part of this. . . ."

Part II is worthy of the high praise we have already bestowed upon Part I, and assures us that the 'Dictionary' will prove to be one of the most useful hand-books of general ornithology ever published. It would be easy to pick flaws here and there, but its general excellence would render this an ungracious task. We may, however, call attention to one singular oversight in respect to the genus *Otocoris* (or *Otocorys*, as our author prefers to write it), where in a foot-note to page 511 it is stated, "By American writers it is usually called *Eremophila*, but that name is pre-occupied in natural history." While this was formerly the case, the name *Otocoris* for the Horned Larks has been in almost universal use among American writers for a full decade, the change having been made as early as 1882, and became generally adopted as early as 1884. Such occasional slips are doubtless due to the fact that portions of the work have been bodily transferred from the 'Encyclopædia Britannica' without subjection to quite the rigid scrutiny the lapse of time has rendered necessary.

While it is not customary to look for an *index* to a *dictionary*, in the present case an index would prove an indispensable adjunct, since very few of the almost numberless technical names of genera and species, and even of the higher groups, appear as titles of articles, but must be sought in the body of the text. It is hence not to be supposed that such an important matter will be overlooked by either the author or the publishers. — J. A. A.

Salvadori's Catalogue of the Pigeons.—The introduction to the 'Catalogue of the Columbæ'¹ gives a useful though brief sketch of the literature of the subject, from which it appears that the number of species enumerated by G. R. Gray in 1871 was 378, while Schlegel in 1873 recognized only 249. The number recognized in the present 'Catalogue' is 458, while notice is taken of 27 others regarded by the author as of a more doubtful character. The British Museum Collection, we are informed, contains, after the elimination of duplicates, 7359 specimens, belonging to 415 species. Of these species "112 are represented by typical specimens, besides 47 which are types of species that have been identified with others previously described." Only "42 species are still desiderata in the Collection"! Eleven are here described for the first time. In the acknowledgments of assistance it is stated that "the whole of the American species" were worked out with the help of Mr. Salvin.

The order Columbæ is divided into two suborders, 1, Columbæ, 2, Didi; the latter consisting of the two extinct genera *Pezophaps* and *Didus*, known thus far only from the islands of Mauritius, Réunion, and Rod-

¹ Catalogue | of the | Columbæ, or Pigeons, | in the | Collection | of the | British
Museum. | By | T. Salvadori. | London: | Printed by order of the Trustees. | Sold
by | Longmans & Co., 39 Paternoster Row | [= 4 lines, names of booksellers]
| 1893.—8vo, pp. i-xvii, 1-676, pll. i-xv. = Catalogue of the Birds in the British
Museum, Vol. XXI.

riguez. The Columbæ proper, or the existing Pigeons, are separated into five families, namely: (1) Treronidæ, (2) Columbidæ, (3) Peristeridæ, (4) Gouridæ, (5) Didunculidæ: Only the Columbidæ and Peristeridæ are represented in the New World. The Treronidæ, or Tree Pigeons, are separated into three subfamilies and 19 genera, and number about 190 species, 75 of which are referred to the genus *Ptilopus* and 43 to the genus *Carpophaga*. The Columbinae, mainly restricted to the Old World, number 100 species, of which more than half are referred to the single genus *Columba*. The Peristeridæ embraces seven subfamilies, 36 genera, and some 250 species, only about 70 of which are American and the rest, as well as the Gouridæ (6 species) and the Didunculidæ (1 species), belonging to the Old World.

Prof. Salvadori appears to have done his work with great care and thoroughness, and has thus placed all ornithologists under a deep debt of gratitude. In matters of nomenclature he of course takes some liberties, or at least what would be so considered on this side of the water (*cf.* Auk, IX, p. 278, 279). It is hardly consistent, however, for him to accept *Turtur turtur* (ex *Columba turtur* Linn.) on p. 396 while he rejects *Zenaida zenaida* (ex *Columba zenaida* Bon.) on p. 382. We of course would not expect him to permit *Columbigallina*, "a long, badly constructed name," to supercede *Chamæpelis*, though having eleven years priority.

For the genus of late currently recognized under the name *Engyptila* he prefers the preoccupied name *Leptoptila*; but there seems to be a name which should supercede *Engyptila* (Sundevall, 1872); namely, Salvadori's own name *Homoptila* which has a year's priority.¹ This same genus gives rise also to several other much to be lamented changes of nomenclature, since our author finds that *Columba erythrothorax* Temm. and Knip, said to be from Surinam, is in all probability an African species identical with *Aplopelia larvata* (Bon. ex Temm. and Knip). At all events, it "cannot be identified with any of the known species of the genus *Leptoptila*," and hence the South American bird so long known as *Leptoptila erythrothorax* becomes *Homoptila reichenbachi* (Pelz.). Another case, affecting a North American species, is that of our *Engyptila albifrons* (Bon.), Prof. Salvadori finding that the type of *L. albifrons* Bon., in the Paris Museum, "is undoubtedly a specimen of *L. jamaicensis*." Hence another name becomes necessary for the species so long and almost exclusively known as *Leptoptila* (or *Engyptila*) *albifrons*, and Salvadori takes for it *brachyptera* Gray, a *nomen nudum*, used by Gray in 1856 for Mexican specimens of this species, still extant in the British Museum. Hence the name for our

¹ *Homoptila* Salvad. Atti. R. Ac. Sci. Tor. VI, 1871, p. 131. Type *Homoptila decipiens* Salvad., l. c. = *Leptoptila ochroptera* Pelzeln, 1870.

Engyptila Sundevall, Meth. nat. Av. disp. Tent. 1872, p. 156 = *Leptoptila* Swain. (preoccupied), type, *Columba rufaxilla* Rich. and Bern.

White-fronted Pigeon now becomes *Homoptila brachyptera* (Salvad.).¹ The name *brachyptera* must of course date from Salvadori, 1893, the name being then for the first time properly established.

There is, however, among the alleged synonyms of *brachyptera* a still earlier name, to wit, *Leptoptila fulviventris* Lawrence, 1882, which Salvadori, after an examination of the type, places here. He remarks, however, "Some Yucatan specimens (*L. fulviventris* Lawr.) are more fulvous on the flanks, and, perhaps, less bright on the hind neck; generally they have the forehead more vinous, but some specimens from other localities match them in this respect." An examination of the type and several other Yucatan specimens labelled by Mr. Lawrence as *L. fulviventris*, in the collection of the American Museum of Natural History, however, seems to render their reference here extremely doubtful, they differing greatly from a large series of Texas and Mexican specimens of '*albifrons*,' apparently much more nearly agreeing with *Homoptila verreauxi* (Bon.), especially in the large amount of rufous on the inner web of the quills. It hence seems much safer to take the name *brachyptera* for the northern bird, usually heretofore known as *albifrons*. Probably a number of the forms in this genus ranked by Salvadori as species will eventually be found to be entitled to recognition merely as subspecies or geographical forms.—J. A. A.

Elliot's Monograph of the Pittidæ.²—'A Monograph of the Pittidæ,' published in 1863, was the first of the long series of finely illustrated monographs for which ornithologists are so deeply indebted to Mr. D. G. Elliot. In the interval of thirty years that has elapsed since its first appearance our knowledge of the group has greatly increased, many species in the meantime having been described, and the habits and relationships of the others have become better known. It is therefore peculiarly fitting that the group should be again monographed by the same hand. This "second edition, revised and enlarged," is practically a new work, not only much new matter being added, but the whole is rewritten, and the nomenclature much altered. The work is to form five parts, each part to contain ten plates; the new plates being drawn by Mr. W. Hart, while the old ones are by the author. The species figured in Part I are *Eucichla gurneyi*, *E. schwaneri*, *Pitta moluccensis*, *P. maxima*, *P. venusta*, *P.*

¹ *Peristera brachyptera* G. R. Gray, List Bds. Brit. Mus., Columbæ, 1856, p. 54 (*nomen nudum*).

Leptoptila brachyptera Salvad., Cat. Bds. Brit. Mus. XXI, 1893, p. 545.

Homoptila brachyptera Allen, MS.

Leptoptila albifrons Sclater (nec Bon.) P. Z. S., 1857, p. 214, and of most subsequent writers.

² A Monograph of the Pittidæ, or Family of Ant-Thrushes. By D. G. Elliot, F. R. S. E., etc. Second Edition, revised and enlarged. Part I. London: Bernard Quaritch, 15 Piccadilly, W. April, 1893. Folio, 10 colored Plates and text.

rosenbergi, *P. oatesi*, *P. angolensis*, *P. arcuata*, and *P. sordida*. One of these (*P. oatesi*) appears not to have been before figured, and three others are not included in the first edition of the 'Monograph.'

The changes in nomenclature that may be expected in the present as compared with the former edition have been foreshadowed in Mr. Elliot's recent article 'On the Genus *Pitta* Vieillot' (*Auk*, X, 1893, pp. 51, 52), and in remarks apropos of Dr. Stejneger's paper on the same subject (l. c., pp. 184, 185). It is therefore not a surprise that he should follow the A. O. U. Code respecting the rule of priority and adopt the earliest specific name in the case of *Pitta moluccensis* and *P. sordida* in the place of later-given though more current names favored by some other recent writers on the group. We regret to note, however, that he lapses in consistency in accepting the amended form *arcuatus* for Gould's earlier though less fortunate *arquatus*.

Few groups of birds present greater beauty of plumage than the Pittidæ or Ant-Thrushes, or offer greater opportunities for the skill of the artist in illustration, and in the present instance the plates give ample testimony of their ability.—J. A. A.

Sharpe on the Zoögeographical Areas of the World.¹— In the August number of 'Natural Science,' Dr. Sharpe has given a summary of his views on the different regions, subregions, etc., of the world as illustrated in his recent course of lectures on the 'Geographical Distribution of Birds' delivered at the Royal Institution. In his introductory remarks he laments the "want of zoological statistics for vast tracts of the Old World," and congratulates American naturalists on "the success which has resulted from their patient collection of materials, which leaves them in the proud position of having better statistics to work upon than are possessed by the ornithologists of any other portion of the globe," with the exception, perhaps, of those of the British Islands.

Dr. Sharpe says: "Some of Mr. Allen's conclusions ('*Auk*,' 1893, pp. 97-150) with regard to the main divisions of the Old World are the same as those of Dr. Reichenow, and I think that they are, in both instances, too sweeping; but the recognition and definition of an Arctic Zone, or 'Realm,' as Mr. Allen calls it, is a fact which must henceforward be admitted by all ornithologists." After this last admission it is somewhat disappointing to find him still partitioning the northern portion of the northern hemisphere into two primary areas, under the very familiar names of 'Nearctic Region' and 'Palearctic Region.' This inconsistency, however, he accounts for as follows: In giving reasons for not adopting "Mr. Allen's nomenclature in its entirety," he says: "I may in due time be brought to speak of 'Realms,' but the same conservatism which prevents my adopting

¹ On the Zoo-geographical Areas of the World, illustrating the Distribution of Birds. By R. Bowdler Sharpe, LL. D., F. L. S. *Natural Science*, Vol. III, No. 18, pp. 100-108. Aug., 1893. With Maps.

the trinomial nomenclature of the American zoologists of the present day will prevent my discarding some of the old-fashioned, and, to me, expressive zoo-geographical terms. I cannot understand why the word 'Nearctic' should be discarded."

In the present brief paper (for so extensive a subject) our author does not attempt to characterize his various areas by specifying their distinctive ornithic elements, but he in a general way defines the boundaries of his regions, and enumerates their principal subdivisions. His primary divisions or 'Regions' are six in number, as follows: A, Nearctic; B, Neotropical; C, Palæarctic; D, Ethiopian; E, Indian; F, Australian. For the New World he thus adopts "the old divisions of the Nearctic and Neotropical Regions." The Nearctic he subdivides as follows:—

- I. Arctic Subregion.
- II. Alaskan Arctic Subregion.
- III. Aleutian Subregion.
- IV. Cold Temperate Subregion.
- V. Warm Temperate Subregion.
 - 1. Humid Province.
 - a. Appalachian Subprovince.
 - β. Austroriparian Subprovince.
 - 2. Arid Province.
 - γ. Campestrian Subprovince.
 - δ. Sonora Subprovince.

These areas are practically the same as those designated by similar names by the present writer, except that I, II, and III differ in grade and allocation, ranking here as divisions of the second grade instead of divisions of the very lowest grade, or below subprovinces. The incongruity of his classification of the Arctic portion of the northern hemisphere is further brought out under "C.—The Palæarctic Region," where he says: "This may be divided roughly into three subregions, besides the *Arctic Zone*, which corresponds with the same zone in the New World, and becomes a circumpolar province." In other words, a "circumpolar province" is subdivided into four "subregions," which are apportioned between two "regions."

As regards the 'Neotropical Region,' or the "Southern Region of the New World," it is divided into subregions and provinces much as has been done by previous writers. The 'Palæarctic Region' is divided into a 'Eurasian Subregion' and a 'Mediterranean-Asiatic Subregion'; "the one answering to Mr. Allen's 'Cold Temperate Subregion,' and the other to his 'Warm Temperate Subregion.'" Each of these is divided into three 'Provinces.' The Palæarctic is further subdivided into "III, Mantchurian Subregion," and "IV, the Himalo-Caucasian Subregion," the latter also with three provinces.

The Ethiopian Region is divided into eight 'Subregions,' one, the South African, having two Provinces. This classification is to a large extent

new, being even considerably modified from that proposed by the same writer in 1870.

The Indian Region is divided into five subregions, and the Australian into seven; but they are given simply in a tabular enumeration without attempt at definition beyond that implied in the names given them. The accompanying maps, however, serve to define them, and also all of the other zoögeographical areas mentioned in the accompanying text.

The paper as a whole gives evidence of hasty preparation, and is quite too brief for a satisfactory presentation of the subject, the treatment being merely in outline. We trust that Dr. Sharpe will soon find time to return to this interesting subject, to which he has evidently given so much attention, and present his views in greater detail, backed by fuller statistical information as to the distinctive elements of the several areas here outlined. For the most part his scheme seems reasonable, the chief blemish being in his treatment of the Arctic and Cold Temperate portions of the northern hemisphere, which is much less satisfactory than Prof. Newton's allocation of this whole area as a single 'Holarctic Region' (*cf. antea*, p. 59). —J. A. A.

Apgar's Pocket Key of Birds.¹—A manual of North American birds compact enough and cheap enough to accommodate itself to every one's pocket, one by which even the most inexperienced can identify a bird in the hand, will be widely welcomed. Indeed it is hard to conceive of a more useful book—or one more difficult to prepare. It is not so very hard, with unlimited space and a free use of technical terms, to write descriptions by which an ornithologist of some experience can identify birds he already more than half knows; but diagnoses that shall be concise and sufficient, untechnical and clear, that shall make obscure plumages easy for the tyro to recognize, are by no means a simple matter. Yet this is exactly what is needed.

The present volume begins with a 'Key to the Families,' and then each family, from the Thrushes to the Grebes, is treated in turn. First comes a key to its genera (and sometimes to convenient subdivisions of the larger genera), then under each a statement of characters by which the species it contains may be distinguished. These specific diagnoses are very brief, averaging only eight or ten words apiece. For many species, those whose characters are well marked and constant, this is enough. In more difficult cases it would not be surprising if the student were to agree with the author, that "after the supposed name is determined, it would be well to read a full description in such works as those of Dr. Jordan, Dr. Coues, or Mr. Ridgway, to verify the determination." When a writer takes such a modest view of the purposes of his book, it is hard to

¹ Pocket Key | of the | Birds | of the | Northern United States, | east of the Rocky Mountains. | — | By | Austin C. Apgar, | Author of "Trees of the Northern United States," "Mollusks of the | Atlantic Coast," &c. | — | Trenton, N. J. | The John L. Murphy Pub. Co., Printers. | 1893. 16,° pp. 63[=61].

censure him for lightening his task, as he has done, by ignoring subspecies,¹ and often, too, by giving descriptions only sufficient to identify the adult males. Here, alas, he has but followed in the footsteps of leading ornithologists, and he can hardly be blamed for taking them as models rather than as warnings.—C. F. B.

Allen's Notice of some Venezuelan Birds, collected by Mrs. H. H. Smith.²—Although based on a small collection of about 60 specimens, this paper shows what may yet be done in comparatively well worked areas of South America, three of the forty-eight species being new to science, two others present differences which will probably be found constant when additional specimens are examined, while the identification of two others is merely provisional.

The new forms described are *Ramphocælus atrosericus capitalis*, *Lophotriccus subcristatus*, and *Picumus obsoletus*—all from El Pilar, "a little way in the interior" of the country.

A species which, if correctly identified, has its known range much extended is *Hapalocercus fulviceps* (Scl.), previously recorded only from western Ecuador and Peru.

We regret to see, in the spelling of the generic name *Ramphocælus* (instead of *Ramphocelus*), on p. 51, a disregard—doubtless accidental—of one of the rules of nomenclature of the American Ornithologists' Union (Canon XL).—R. R.

Allen's List of Birds collected in Northeastern Sonora and Northwestern Chihuahua.³—This is a list of 162 species, based on a collection of about one thousand specimens, made chiefly by Mr. Frank Robinette, of Washington, D. C. Although the localities represented are 150 miles or more from the southern boundary of Arizona, all but ten of the 162 species have been taken within our limits. These peculiarly Mexican forms are the following: "*Callipepla elegans*" (= *C. e. bensoni* Ridgw.⁴), *Rhynchopsitta pachyrhyncha*, *Euptilotis neoxenus*, *Campephilus imperialis*, "*Myiarchus inquietus* Salv. and Godm.,"⁵ *Aimophila superciliosa*,

¹This is doubly unfortunate, for it results in the introduction of misleading names,—for instance, *Turdus aonalaschkæ*, *Ammodramus sandwichensis*, and *Empidonax pusillus* for the Hermit Thrush, Savanna Sparrow, and Traill's Flycatcher.

²Notice of some Venezuelan Birds, collected by Mrs. H. H. Smith. By J. A. Allen. Bull. Am. Mus. Nat. Hist., Vol. IV, No. 1, Article V, April 6, 1892, pp. 51-56.

³List of Mammals and Birds collected in Northeastern Sonora and Northwestern Chihuahua, Mexico, on the Lumholtz Archæological Expedition, 1890-92. By J. A. Allen. Bull. Am. Mus. Nat. Hist., Vol. V, Art. 3, March 16, 1893, pp. 27-42.

⁴Forest and Stream, XXVIII, No. 6, 1887, p. 106; Proc. U. S. Nat. Mus., X, July 2, 1887, 148-150.

⁵Identification open to question.

A. mcleodi, *Peucaea notosticta*, *Melospiza fasciata mexicana*, *Geothlypis trichas melanops* and *Basileuterus rufifrons*.

The names of the North American species are unaccompanied by the authorities, but the latter are given in the case of ten species extra-limital to the A. O. U. Check-List, always, however, in parentheses, which are required in only five of them. This typographical blemish does not, however, detract from the value of the paper, except in so far as it wrongly represents the nomenclature of the species affected.

There are two or three identifications, in addition to that of the supposed *Myiarchus inquietus*, we believe will bear reconsideration, as for example, *Melospiza fasciata mexicana* and *Geothlypis trichas melanops*, which certainly seem out of place in the list.—R. R.

Chapman's Notes on Birds observed near Trinidad, Cuba.¹—This carefully prepared and highly interesting paper is worthy of more extended review than can be given it at present. The introductory portion consists of a pleasing description of the localities visited. Then follow 'Notes on Cuban Birds' arranged under the separate headings of 'General Impressions of Cuban Bird-life,' 'The Migration,' 'Birds observed while sailing from Batabanó to Trinidad,' 'The Cuban Avifauna,' and 'Species Described as New or Added to the Cuban Fauna.' The 'Annotated List of Birds Observed' includes 99 species, of which *Rallus longirostris cubanus* is described as new on page 288.

In connection with certain Cuban species the representative forms of other islands are discussed, and in some cases separated, for example the Jamaican representative of *Pitangus caudifasciatus*, which is named *P. jamaicensis* (p. 303) and the Bahaman representative of *Dendroica petechia gundlachi*, which is named *D. p. flaviceps* (p. 310). A new genus, *Ptiloxena*, is instituted for the so-called "*Scolecophagus*" *atroviolaceus*, a procedure both justifiable and timely.

The critical remarks and biographical notes embodied in this paper are of excellent quality, and the paper as a whole one of first-class merit.—R. R.

Minor Ornithological Publications.—'Forest and Stream.' This journal was last noticed in Vol. IX, pp. 384-387. In Vols. XXXIX and XL (July, 1892-June, 1893) are the following (Nos. 2611-2697).

2611. *Bonasa umbellus*, *Rex*. By Dr. Robert T. Morris. 'Forest and Stream,' Vol. XXXIX, No. 1, July 7, pp. 6-7.—A biographical sketch.

2612. *Rare Birds' Nests*. By H. Austen. *Ibid.*, No. 2, July 14, 1892, p. 28.—*Regulus calendula*.

2613. *A Bit of Grouse Hunter's Lore*. By Dr. Robert T. Morris. *Ibid.*, No 3, July 21, 1892, p. 49.—*Bonasa umbellus*.

¹ Notes on Birds and Mammals observed near Trinidad, Cuba, with remarks on the Origin of West Indian Bird-Life. By Frank M. Chapman. Bull. Am. Mus. Nat. Hist., Vol. IV, Art. XVI, Dec. 29, 1892, pp. 279-330.

[‘Forest and Stream.’—Continued.]

2614. *Stocking Massachusetts Covers.* By John Fottler, Jr., Edward E. Hardy, Henry J. Thayer, Edward Brooks, and Outram Bangs. *Ibid.*, No. 4, July 28, 1892, p. 70.—*Cupidonia cupido*, *Pediocætes phasianellus columbianus*, *Colinus virginianus*, *Oreortyx pictus*, *Callipepla gambeli*.
2615. *Notes on the Sandhill Crane.* By Orin Belknap. *Ibid.*, No. 5, Aug. 4, 1892, p. 91.
2616. *Bird Life in a City Yard.* By Morris Gibbs. *Ibid.*, No. 6, Aug. 11, 1892, p. 114.—Kalamazoo, Michigan.
2617. *Photographing a Nesting Woodcock.* By G. Hills. *Ibid.*, No. 7, Aug. 18, 1892, p. 135.
2618. *A Habit of the Robin.* By N. D. Elting. *Ibid.*, No. 9, Sept. 1, 1892, p. 179.
2619. *Migrating Martens.* By B. *Ibid.*—*Progne subis* at Bucksport, Maine.
2620. “*Life Histories of N. A. Birds.*” *Ibid.*, No. 11, Sept. 15, 1892, pp. 222–223.—Review of Capt. C. E. Bendire’s book.
2621. *The Strange Adventure of a Gull.* By P. *Ibid.*, No. 13, Sept. 29, 1892, p. 267.—*Larus argentatus smithsonianus* caught by a quahaug.
2622. *Days with the Upland Plover.* By T. S. Van Dyke. *Ibid.*, No. 14, Oct. 6, 1892, p. 292.
2623. *Bird Notes from Missouri.* By Jasper Blines. *Ibid.*, p. 294.
2624. *Game Birds for Massachusetts.* By Henry J. Thayer. *Ibid.*—*Callipepla gambeli*, *Tympanuchus americanus*, *Pediocætes phasianellus columbianus*.
2625. *Migration of Hawks.* By Wilmot Townsend. *Ibid.*, No. 15 Oct. 13, 1892, p. 311.
2626. *Land Birds at Sea.* By H. *Ibid.*
2627. *A Habit of the Robin.* By Morris Gibbs, M. D. *Ibid.*, No. 16, Oct. 20, 1892, p. 333.
2628. *A Prairie Chicken Migration.* By D. D. Banta. *Ibid.*, No. 21, Nov. 24, 1892, p. 443.
2629. *Eggs killed by Heat.* By West Virginian. *Ibid.*—*Colinus virginianus*.
2630. *American Ornithologists’ Union.* *Ibid.*, p. 444.—Report of Tenth Congress.
2631. *Recollections of Golden Plover.* By T. S. Van Dyke. *Ibid.*, p. 445.
2632. *Eggs killed by Heat.* By H. S. *Ibid.*, No. 23, Dec. 8, 1892, p. 488.—*Colinus virginianus*.
2633. *Grouse in Confinement.* From the ‘Chenango (N. Y.) Union.’ *Ibid.*, p. 489.—*Bonasa umbellus*.
2634. *Vermont Quail.* By John W. Titcomb. *Ibid.*, No. 24, Dec. 15, 1892, p. 513. *Colinus virginianus* introduced at certain places.
2635. *Those Vermont Quail.* By W. C. Witherbee. *Ibid.*, No. 25, Dec. 22, 1892, p. 536.

[‘Forest and Stream.’—Continued.]

2636. *Familiar Acquaintances. The Ruffed Grouse.* Editorial. *Ibid.*, Vol. XL, No. 2, Jan. 12, 1893, p. 23.
2637. *Snowy Owls.* By J. L. Davison. *Ibid.*, No. 3, Jan. 19, 1893, p. 47.
2638. *Blue Goose in Rhode Island.* By F. L. Glezen. *Ibid.*, p. 48.
2639. *Cold Weather Notes.* By Alfred A. Frazer. *Ibid.*, No. 4, Jan. 26, 1893, p. 71.—*Colinus virginianus.*
2640. *Georgia Woodcock.* By Jersey. *Ibid.*
2641. *A South Carolina Woodcock Flight.* By J. U. Gregory. *Ibid.*, p. 74.
2642. *The “Ocean Sheldrake” a Goosander.* Editorial. *Ibid.*, No. 5, Feb. 2, 1893, p. 93.
2643. *Eider Shooting on the Maine Coast.* By W. S. J. *Ibid.*, p. 96.—Notes on *Somateria dresseri*, *S. spectabilis* and *Histrionicus histrionicus.*
2644. *Pine Grosbeaks.* By William Brewster. *Ibid.*, No. 6, Feb. 9, 1893, p. 115.
2645. *Pinnated Grouse in Western Massachusetts.* *Ibid.*, No. 7, Feb. 16, 1893, p. 135.
2646. *The Pine Grosbeak.* By J. G. Rich. *Ibid.*, No. 8, Feb. 23, 1893, p. 157.
2647. *An Eagle in a Trap.* By Jagare. *Ibid.*, No. 9, March 2, 1893, p. 179.—*Aquila chrysaetos.*
2648. *A Wise Loon.* By E. H. C[lark]. *Ibid.*, p. 180.—*Urinator imber.*
2649. *Sierra Bird Notes.* By Arefar. *Ibid.*, No. 10, March 9, 1893, p. 205.—*Spinus tristis*, *S. psaltria*, *Sialia arctica*, *Mimus polyglottos*, *Cinclus mexicanus.*
2650. *How it is Going.* By W. W. *Ibid.*, p. 209.—*Meleagris gallopavo* at Chatham, Ontario.
2651. *Curious Fatality among Crows.* By M. G. Ellzey, M. D. *Ibid.*, No. 11, March 16, 1893, p. 228.
2652. *The Cuckoo.* By J. G. R[ich]. *Ibid.*—*Coccyzus erythrophthalmus* at Bethel, Maine.
2653. *Bird Chat.* By Wilmot Townsend. *Ibid.*, No. 12, March 23, 1893, p. 248.—On *Troglodytes aëdon*, *Spizella socialis*, *Bonasa umbellus*, *Tympanuchus americanus*, *Turdus mustelinus*, *Harporhynchus rufus*, and others.
2654. *Notes on the Pine Grosbeak.* By Hermit and A. P. F. Coape. *Ibid.*, p. 250.
2655. *The Heath Hen—Where?* By Wm. Dutcher and the editor. *Ibid.*
2656. *Bald Eagle and Golden.* By Wm. Dutcher. *Ibid.*
2657. *The Woodcock have Come to Town.* By Subscriber and W. Alex. Bass, Jr. *Ibid.*, No. 13, March 30, 1893, p. 271.
2658. *Woodcock in Town.* *Ibid.*, No. 14, April 6, 1893, p. 294.—Note on the Woodcock’s whistling.

['Forest and Stream.'—Continued.]

2659. *Moulting of Ducks*. By Fred. Mather. *Ibid.*
 2660. *The Mongolian Pheasant*. By Thomas G. Farrell. *Ibid.*, p. 297.—Habits in Oregon.
 2661. *Chukor Partridges in Illinois*. By W. O. Blaisdell. *Ibid.*, No. 15, April 13, 1893, p. 317.—*Caccabis chucor*.
 2662. *The Wiping Out of the Wild Pigeon*. By M. *Ibid.*, p. 318.
 2663. *Song of the Western Meadow Lark*. By J. W. A. *Ibid.*, No. 16, April 20, 1893, p. 337.
 2664. *Pine Grosbeak in Minnesota*. By One of the Unreliables. *Ibid.*
 2665. *Michigan Bird Arrivals*. By B. Swales. *Ibid.*—At Detroit.
 2666. *Acquired Habits of California Quail*. *Ibid.*, p. 338.
 2667. *Mongolian Pheasants are Good Swimmers*. By N. Wallace. *Ibid.*—Introduced at Farmington, Conn.
 2668. *Maine's Vanishing Game*. By Tom Ford. *Ibid.*, No. 17, April 27, 1893, p. 359.—Notes on *Ectopistes migratorius*, *Quiscalus g. æneus*, et al.
 2669. *Audubon Monument Ceremonies*. *Ibid.*, pp. 360-361.—Some biographical matter concerning J. J. Audubon.
 2670. *Yellow-breasted Chat*. By George Boudwin. *Ibid.*, No. 18, May 4, 1893, p. 381.—Habits in Pennsylvania.
 2671. *Cuckoo or Raincrow*. By N. A. T. *Ibid.*, p. 382.—*Coccyzus americanus* (?) in Texas.
 2672. *Bewildered Migrants*. By Mrs. Mary L. Rame. *Ibid.*—At Manchester, Iowa.
 2673. *Bobolinks have Come*. By M. C. H. *Ibid.*—At Cortland, N. Y.
 2674. *North Dakota Game*. By Elmer T. Judd. *Ibid.*—Additions to a list of "game" birds of Towner Co., N. D. See Auk, IX, 69, No. 2181.
 2675. *Eastern Maine Notes*. By Tom Ford. *Ibid.*—*Branta canadensis* and *Bonasa u. togata* near Bangor.
 2676. *Oregon Pheasants and Quail*. By S. H. Greene. *Ibid.*, p. 385.
 2677. *Capercaillie for America*. *Ibid.*, No. 19, May 11, 1893, p. 401.—See No. 2688.
 2678. *Spring Notes*. By Stanstead and B. H. S. *Ibid.*; p. 403.—Contains notes on *Ectopistes migratorius* near Highgate, Va., and on various species at Detroit, Mich.
 2679. *The Woodcock's Ways*. By H. S. *Ibid.*, pp. 403-404.
 2680. *The Pheasant's Worth*. By J. A. Beebe, M. D. *Ibid.*, p. 404.—*Phasianus torquatus*, *P. pictus*, *P. nycthemerus*.
 2681. *Notable Shots*. By Old Avalance. *Ibid.*, p. 406.—*Botaurus lentiginosus*.
 2682. *Some Feathered Scalawags*. By Didymus. *Ibid.*, No. 20, May 18, 1893, p. 425.—*Lanius ludovicianus* and *Cyanocitta cristata florincola*.
 2683. *A Wearied Migrant*. By Twelve-Bore. *Ibid.*—*Seiurus aurocapillus* in a Boston backyard.
 2684. *Description of a New Prairie Hen*. By Chas. E. Bendire. *Ibid.* *Tympanuchus attwateri*.

[‘Forest and Stream.’—Continued.]

2685. *Quail in Northern New York.* By W. C. W. *Ibid.*, p. 427.
2686. *Massachusetts Quail.* By Special. *Ibid.*
2687. *Vermont Deer, Pheasant and Quail.* By Wheelock. *Ibid.*
2688. *The End of the Capercailzie.* By L. *Ibid.*—See No. 2677.
2689. *A Robin's Farm Bell Nest.* *Ibid.*, No. 21, May 25, 1893, p. 446.
2690. *Breeding Ruffed Grouse.* By Jay Beebe. *Ibid.*, p. 448.—In captivity.
2691. *Nehrling's 'North American Birds.'* *Ibid.*—Notice of the book.
2692. *Faguar, Owl and Skunk.* By N. A. T. *Ibid.*, No. 22, June 1, 1893, p. 470.—Correcting No. 2671.
2693. *A Habit of the Robin.* By J. M. English. *Ibid.*, p. 471.
2694. *That Habit of the Robin.* By N. D. Elting. *Ibid.*, No. 24, June 15, 1893, p. 513.
2695. *Hawk Migration.* By Karl V. S. Howland. *Ibid.*—At Montclair, N. J.
2696. *The Owl's Antics.* By J. W. S. *Ibid.*, No. 25, June 22, 1893, p. 539.—*Asio accipitrinus* (?).
2697. *Hawk Migration.* By Nims. *Ibid.*, No. 26, June 29, 1893, p. 561.—At Baldwinsville, Mass.—C. F. B.

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Ridgway, R. (1) Remarks on the Avian Genus *Myiarchus*, with special reference to *M. yucatanensis* Lawrence. (Proc. U. S. Nat. Mus. XVI, pp. 605–608.) (2) On a small Collection of Birds from Costa Rica. (*Ibid.*, pp. 609–614.) (3) Catalogue of a Collection of Birds made in

Alaska by Mr. C. H. Townsend during the Cruise of the U. S. Fish Commission Steamer *Albatross*, in the Summer and Autumn of 1888. (*Ibid.*, pp. 663-665.) (4) Description of a New Storm Petrel from the Coast of Western Mexico. (*Ibid.*, pp. 687, 688.) (5) A Revision of the Genus *Formicarius* Boddaert. (*Ibid.*, pp. 667-686.)

Sclater, P. L. Chairman's Address on opening the Second Session of the British Ornithologists' Club.

Short, Ernest H. Birds of Western New York, with Notes. 8vo, pp. 13. Chili, New York, 1893.

Shufeldt, R. W. (1) On the Mechanism of the Upper Mandible in the Scolopacidæ. (*Ibis*, Oct. 1893, pp. 563-565.) (2) Some Recent Economic Questions in Ornithology. (*Science*, XXII, pp. 255, 256.) (3) Audubon the Naturalist. (*The Great Divide*, Sept. 1893.) (4) Short Studies of some of our Owls. (*Ibid.*, Nov. 1893.)

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GENERAL NOTES.

The Parasitic Jaeger at Bellingham Bay, Washington.—October 28, 1893, I shot, on Bellingham Bay, a Parasitic Jaeger, *Stercorarius parasiticus*, which species, I believe, has not heretofore been reported from this quarter of the Union, or at least from this State. The mounted skin of this specimen is now in my possession. The phase of plumage which it represents may, perhaps, be understood from the following description: Above chiefly dusky, darker on primaries, rectrices and crown, the hind neck paler, the sooty-brown feathers of interscapulars interspersed with feathers which are black broadly tipped with white; black and white bars extend around lower neck and across chest in a broad band; sides coarsely barred with black and white; both under and upper tail coverts contain plain dusky feathers mingled with feathers barred with black and buffish white; belly, throat and chin white; sides of neck whitish finely specked with dusky; small patch of pale buff at extremity of forehead; tarsi and feet black; nasal shield leaden blue. Length, 20 inches; wing, 13; longest tail feathers, 8.50. When killed, the bird, with another of presumably the same species, was vigorously chasing a Bonaparte's Gull. Its companion, which escaped capture, appeared to be of a nearly uniform sooty brown above and below, rather lighter than the upper parts of the one taken.—JOHN M. EDSON, *New Whatcom, Washington.*

Further News of the Gull 'Dick.'—As the migratory movement of a certain American Herring Gull (*Larus argentatus smithsonianus*) called 'Dick' (see Auk, Vol. IX, p. 227, and Vol. X, p. 76) for the year 1893 may be of interest to some of the readers of 'The Auk,' I quote from two letters received, in answer to my enquiries, from Capt. Edward Fogarty of the Brenton Reef Light-ship, stationed off Newport, Rhode Island. The first of these was dated April 10, 1893, and states that the last seen of 'Dick' was on the evening of the 7th inst., just before sundown, at which time the bird received its supper. It would seem that 'Dick' inclined to have company during migration this season, for he brought another Gull with him to jointly partake of the supper provided. When the ship's lights were hoisted for the night both birds departed in company, and no more was seen of them. The second letter was dated October 7, 1893, and informs me that on this date at one o'clock P. M., 'Dick' again appeared at the light-ship for the first time since his departure. In appearance he was ragged and torn and minus tail feathers. He had a voracious appetite, eating as much as a hungry dog. It seemed as though he would never get enough to satisfy him. His arrival in 1892 was on September 28, at five o'clock P. M.—GEO. H. MACKAY, *Nantucket, Mass.*

The Black Tern at Washington, D. C.—September 18, 1893, I shot thirteen Black Terns. Previous to this I am aware of only one recorded instance of its occurrence, one being found dead September 18, 1882.—EDWARD J. BROWN, *Washington, D. C.*

Hydrochelidon nigra surinamensis in Connecticut. — On the afternoon of August 29, 1893, after the hard southeast gale of that morning, I found a flock of about forty Black Terns on the Quinnipiack Marshes near here. Possibly this was the same flock that was seen at Milford, Conn., on August 24, during the heavy gale of that date, and reported in 'Forest and Stream' for September 23. — LOUIS B. BISHOP, *New Haven, Conn.*

Olor columbianus in Connecticut. — Thanks to Captain O. N. Brooks, I am enabled to record the capture of a young Whistling Swan at Guilford, Conn., on November 2 or 3, 1893. It was shot off Guilford Harbor by a Mr. Reuben Hill, and, according to Captain Brooks, is the first specimen of this species taken in that vicinity during the last fifty years. — LOUIS B. BISHOP, *New Haven, Conn.*

Note on Rougetius aldabranus. — Since describing this species in the 'Proceedings' of the National Museum, Vol. XVI, No. 953, p. 598, I have discovered that it had already been characterized and named by Dr. Gunther in the 'Annals and Magazine of Natural History,' ser. 5, Vol. III, 1879, p. 164, as *Rallus gularis*, var. *aldabrana*. Fortunately, we both selected the same name for our respective specific and subspecific titles.

A series of specimens collected by Dr. Abbott on the neighboring island of Assumption I had, provisionally, referred to *R. gularis*; but on further investigation I find that it is not only distinct from the Madagascar bird, but that the latter cannot be *R. gularis*, the type of which, from Mauritius, is said by Hartlaub (*Die Vögel Madagascars*, p. 338) to have the top and sides of the head and neck olive, like the back, whereas these parts in the Madagascar bird are rich chestnut, like the chest. There would thus appear to be four allied but distinct forms of this genus, as follows:—

1. *Rougetius gularis* (Cuv.), Mauritius.
2. *Rougetius bernieri* Bonap., Madagascar.
3. *Rougetius aldabranus* (Gunth.), Aldabra, and
4. *Rougetius abbotti*, sp. nov., Assumption Island.

The last-named is characterized as follows:—

SP. CHAR. — Similar to *R. bernieri* Bonap., but upper parts very much lighter and grayer, black streaks on back narrower, and size less, the wing especially. Differs from *R. aldabranus* in the streaked back and scapulars.

HAB. — Assumption Island.

Type, No. 128,826, U. S. Nat. Mus., Assumption Island, Sept. 18, 1892; Dr. W. L. Abbott. — ROBERT RIDGWAY, *Washington, D. C.*

Phalaropus lobatus—A Correction.—In 'The Auk,' Vol. IV, page 78, I recorded the *Phalaropus lobatus* as having been captured near Hartford. I find on more critical examination, that it is the *Crymophilus fulicarius*. — WILLARD E. TREAT, *East Hartford, Conn.*

The 1893 Migration of *Charadrius dominicus* and *Numenius borealis* in Massachusetts.—Nantucket, August 20, 1893. Lowering sky and southeast wind. While driving over the western portion of the island, I saw in the distance eighteen birds which I thought were a flock of American Golden Plovers. I had been advised that such a flock had been seen in that neighborhood on the 18th inst. The wind was light southeast with severe rain in the night from nine o'clock P. M. until two A. M.

August 21. I was out very early; raining hard; wind increasing and backing to northwest at four A. M., reaching a velocity of fifty to sixty miles an hour, the storm being very severe. I remained out until noon, seeing only two Golden Plovers and one Eskimo Curlew, and I shot one of each. These were the first birds shot here this season. This storm extended by actual reports two hundred miles south of Nantucket. It cleared at 10.30 P. M. in the evening with wind nearly west.

August 22. Wind light southwest to west; no birds.

August 23. Wind southeast, threatening; no birds.

August 24. Up at four o'clock A. M. Rain commenced about five o'clock, and lasted until nine o'clock A. M., raining very hard at intervals; velocity of wind about 50 miles an hour. It then cleared, wind remaining east and east by south, still blowing very hard. No birds.

August 26. Clear, good breeze, southwest and west; think it has been foggy at sea. I was out four hours driving over the plover ground but only saw one Golden Plover. I have heard from the islands of Tucker-nuck and Muskeget and no birds have been seen.

August 27. Foggy around the islands; light warm southeast wind during the early portion of the day; later south to south by west and very foggy; almost calm; no birds.

August 28. Thick weather all last night; no change of wind. Drove over the ground; no birds; warm.

August 28 and 29. Pleasant weather; full moon at night; wind west. Went all over the ground again but no birds.

August 30 and 31. Clear and pleasant; no birds.

September 1. A number of flocks of Plovers were reported to have been heard passing over the island last night; *none* stopped. The only Plover here are a flock of thirty-five located in a certain preserved field, and a small flock of twelve; nine of these were shot on Sept. 9. I drove over the western ground on the 9th and 10th of September but did not see any birds.

September 11 and 12. Pleasant weather; drove over the ground but no birds.

September 13. While driving over the western ground saw nine Golden Plovers from the above preserved field; weather calm, wind light south by west and southwest.

From the 13th to the 16th I drove out daily, but saw no birds. On the 16th I saw a flock of four Golden Plovers and shot two of them. They

had the appearance of being new arrivals. Wind strong south by west. In the afternoon a severe squall with rain lasted three hours, then cleared with wind west.

September 17. I drove over the eastern portion of the island but did not see any birds.

September 18. Clear weather, strong west winds; drove over the western part of the island; saw no birds.

September 19. Rainy day, wind south by west and southwest; drove out but saw no birds. At six and a half o'clock P. M. it cleared with wind west.

September 20. Hazy; a smoky southwester. I was all over the western ground, but failed to discover any birds. From this date until October 4, I drove more or less over the best ground, and saw other sportsmen daily, but no birds were noted except on September 24, when a flock of six *young* American Golden Plover were seen towards the west. These were the *first* and *only young* birds noted this season. I made inquiry of two Edgartown (Martha's Vineyard) sportsmen regarding the birds in their locality and was told that only about a dozen scattering Plover and four or five Eskimo Curlew had been taken. They told me that on the 22d of August some Plovers were seen passing high up over the town (Edgartown) but none stopped.

Summary.—The great scarcity of these birds this season is shown when I state that only fourteen Golden Plover and one Eskimo Curlew have been shot on Nantucket, and only a dozen of the former and four or five of the latter at Edgartown, a record unexampled, I think, for twenty years. In considering the reasons for this scarcity of birds the present season, I must account for it theoretically as due in part to the continued fair weather and favorable migrating conditions which prevailed *prior* to the 20th of August, as also to the long *threatening* weather which seemed to precede for several days all the storms which prevailed during the migratory period this season. The birds probably adapted their migratory movements to such conditions. I have remarked of late years that it is to the *sudden local* storms which occur while they are on passage along this coast that their presence nowadays is due, such conditions forcing them to seek shelter temporarily from the inclement weather. — GEORGE H. MACKAY, *Nantucket, Mass.*

The California Vulture in the San Gabriel Range, California.—In the San Gabriel Range, Sept. 25, 1893, I saw and shot at a California Vulture. When I first saw the Vulture it was about 350 feet away, across a gulch, perched on a fir stub about 40 feet from the ground. Mr. F. Hawley of Los Angeles was with me. The bird had heard us talking, and heard us shoot, but did not fly. I walked up to within 15 or 20 yards before it decided to leave. I then fired. At the report it pitched off the perch and down into a narrow, crooked cañon below, the large white triangular area under the wings showing plainly as the wings were spread. We searched

an hour in the dense chapparal below, but found nothing. Probably, the shot being small, it was but slightly hurt. Neither of us had ever seen this species before in the wild state, although Mr. Hawley is a native of Southern California and has been often in these mountains.

In this connection I beg to correct a mistake in my note on *Fregata aquila*, published in 'The Auk' for October, 1893 (p. 362). In my reference to the Humboldt Bay specimen, I should have quoted Mr. T. S. Palmer instead of Mr. Anthony as the authority for the record.—R. H. LAWRENCE, *Monrovia, Cal.*

Capture of the Golden Eagle at Covington, Virginia.—It gives me pleasure to record the capture of a fine male specimen of the Golden Eagle (*Aquila chrysaëtos*) at Covington, Alleghany County, Virginia, on Oct. 28, 1893. It was shot by Derry B. Smith, Esq., who kindly sent me the specimen for mounting. On skinning I found it very fat. It measured as follows: Length, 33 inches; extent, 78 inches; wing, 24 inches; tail, 14 inches. This is the first specimen, to my knowledge, that has ever been taken in this immediate vicinity.—THADDEUS SURBER, *White Sulphur Springs, W. Va.*

Another Record of the Breeding of the Saw-whet Owl (*Nyctale acadica*) in Eastern Massachusetts.—As there are still but few records of the breeding of the Saw-whet Owl in eastern Massachusetts, I take pleasure in adding one more.

On July 3, 1893, Mr. Gerrit S. Miller, Jr., and I were setting a line of traps in a heavy white pine swamp that lies along Red Brook in the town of Wareham, Mass. We noticed a large old pine stump which was broken off at about 25 feet above the ground and full of Woodpeckers' holes, and pounded on it. We had pounded but once or twice when a Saw-whet Owl popped her head out of the uppermost hole and kept it there motionless, although I fired at her three times with my pistol. The third shot killed her and she fell back into the hole.

On taking the bird out, I found there was a nest containing seven eggs. The nest was quite bulky and composed of gray moss (*Usnea*) interwoven with small pieces of fibrous bark, a few pine needles, small twigs, and feathers of the bird herself. The hole in which the nest was found was 18 feet from the ground and about 8 inches deep.

In the nest besides the eggs was a half eaten red-backed mouse (*Evo-
tomys gapperi*).

Three of the eggs were in various stages of incubation, one being on the point of hatching,—in fact the young bird had already cracked the shell. Three were addled, and one was perfectly fresh.

On dissecting the old bird we found that she had laid her full set of eggs. Her stomach contained the other half of the *Evo-
tomys*, which she was apparently eating when we disturbed her.

I believe the only other records for Massachusetts are:—

'Probable breeding of the Acadian Owl (*Nyctale acadica*) in Massachusetts.' R. Deane, Bull. Nutt. Orn. Club, Vol. II, July, 1877, p. 84. Three specimens in first plumage are recorded,—one, taken June 28, 1876, at Newton, Mass., one at Hingham, Mass., July 5, 1876, and one July 8, 1876.

'Breeding of the Acadian Owl in Eastern Massachusetts.' N. A. Francis Bull. Nutt. Orn. Club, Vol. VI, July, 1881, p. 185. Nest with five young found June 4, 1880, at Braintree, Mass.

'Breeding of the Acadian Owl (*Nyctale acadica*) in Massachusetts.' Bull. Nutt. Orn. Club, Vol. VI, July, 1881, pp. 143-145. Account by William Brewster of nest with four eggs taken at 'Tyngsboro', Mass., April 5, 1881, by W. B. Perham. *Ibid.*, Jan., 1882, pp. 23-25. Additional notes on nesting at Tyngsboro', by W. B. Perham, who found seven nests in all.

'Ornithologist and Oologist,' Vol. XIV, Oct., 1889, pp. 155-156. Record of nest with four eggs, well advanced in incubation, taken at Dunstable, Mass., May 1, 1889, by C. W. Swallow.

In connection with this see also account of four nests found at Holland Patent, N. Y., by Egbert Bagg, in 'Ornithologist and Oologist,' Vol. XII, No. 4, April, 1887, p. 57.—OUTRAM BANGS, *Wareham, Mass.*

Capture of Another Flammulated Owl in California.—On May 26, 1893, I became the possessor of an Owl which after a careful examination Mr. F. Stephens decides is *Megascops flammeola*. As this is only the fourth specimen known to have been taken in this State, I thought it might be of some interest to the readers of 'The Auk' to know of it. This specimen was taken in the San Bernardino range of mountains at an elevation of 5000 feet. The specimen was a male and measured as follows: Length, 7.50 inches; alar extent, 17.50.—E. D. PALMER, *San Bernardino, Cal.*

Empidonax flaviventris on Long Island, N. Y.—While collecting at Flatbush, in the suburbs of Brooklyn, on June 4, 1892, I secured a male Yellow-bellied Flycatcher, which I find is the first record for Long Island. No others were observed, although I hunted carefully through the patch of underbrush and dead saplings where the specimen was secured.—CURTIS CLAY YOUNG, *Brooklyn, N. Y.*

Corrections.—*Xanthocephalus xanthocephalus* and *Spiza americana* in Maine.—In a note in 'The Auk,' Vol. X, July, 1893, p. 302, I mentioned these birds in terms that require further notice. The specimen of *X. xanthocephalus* brought under consideration was first noted by Mr. Ridgway in 1887 (*cf.* Auk, Vol. IV, July 1887, p. 256). But in the dates given in the two notices there is a discrepancy of nearly a year. As I saw the bird before and at the time it was shot, and kept record of the fact in my diary, I feel authorized to furnish the correct date, which is, as I have previously stated, Aug. 17, 1882. That both notes refer to the

same specimen I am thoroughly satisfied, having lately seen Mr. Rackliff and learned that this is the same bird which he sent to Mr. Ridgway, and that he has never shot any other specimen in Maine nor elsewhere. It is evident that the source of erroneous date is not with Mr. Ridgway.

Spiza americana. — The Westbrook specimen and record is preceded by Mr. Charles W. Townsend's Job's Island specimen, recorded in 'The Auk,' Vol. II, Jan., 1885, p. 106. — ARTHUR H. NORTON, *Westbrook, Me.*

The Plumbeous Vireo in Central New York.—On September 24, 1893, I shot an adult female *Vireo solitarius plumbeus* at Peterboro, Madison Co., N. Y. The bird was feeding, just at sunset, among some old apple trees together with Robins, Chipping Sparrows, a few Warblers, and a Downy Woodpecker or two. Its motions seemed excessively deliberate even for a Vireo, though on dissection it proved to be in excellent condition, fully adult and moderately fat. In plumage the specimen is perfectly typical, agreeing in every way with Rocky Mountain examples with which I have compared it. On the other hand, it is much smaller than any of the western birds that I have seen, measuring: wing, 2.93; tail, 2.27; tarsus, 0.70; bill from nostril, 0.28 inch, thus well within the average of true *Vireo solitarius*. The form of the bill also agrees with that of the eastern bird, being much more slender than in the average *plumbeus*, though it is approached by some individuals of the latter race.

I am not now prepared to discuss the significance of these peculiarities, and the bird may for the present stand as above.

So far as I am aware this is the first record of the occurrence of the Plumbeous Vireo beyond the limits of its usual range.—GERRIT S. MILLER, JR., *Cambridge, Mass.*

Dendroica striata in Summer at Washington, D. C. — July 30, 1893, I shot an adult male Black-poll Warbler. The earliest record for the fall migration that I am aware of is Sept. 1, 1889.—EDWARD J. BROWN, *Washington, D. C.*

Helminthophila leucobronchialis. — On July 1, 1893, I found an adult *H. leucobronchialis* with two young in a small tract of alder swamp and woodland of North Haven, Conn. They were little disturbed at my presence, and I watched them carefully for some time. The adult fed both young at short intervals, leaving little doubt of its relationship to them. On July 4, they were still in the same locality, and I collected all three. Possibly the remainder of the family had been killed, as a careful search on both days through the adjacent country failed to disclose any other member of the genus *Helminthophila*.

Decomposition was so far advanced before I could prepare the adult that I was unable to determine its sex. The fact that it never sang while I was watching it, together with the generally dull color of its plumage, lead me to think it a female.

Unfortunately both of the young were still principally in the olive, downy plumage of nestlings, but enough of the final feathering had appeared on the throat, breast, and upper parts to make it certain that one, and probable that the other, would have become a typical specimen of *H. pinus*. The wing-bars of the young differ, being in the most mature specimen narrow and almost white, and in the other broader and light yellow. The plumage of the young would seem to indicate that the missing parent was an *H. pinus*.

These specimens, I think, tend to confirm the theory of Mr. Ridgway that *H. leucobronchialis* is not a valid species, but merely a leucochroic phase of *H. pinus*. — LOUIS B. BISHOP, M. D., *New Haven, Conn.*

Sprague's Pipit (*Anthus spragueii*) on the Coast of South Carolina.—The capture of this far western species was the good fortune of the writer on the morning of November 24, 1893. I had taken advantage of the spring-tide to secure some Scott's Sparrows (*Ammodramus maritimus peninsulæ*), and upon going over a cyclone-swept cotton field *en route* to the marshes, I noticed a bird that resembled the Titlark (*Anthus pensilvanicus*), but observed that it did not wag its tail. I knew at once what it was—a western prize, and I at once shot it. The bird is an adult male in very fine unworn plumage, and was very fat. The exact locality was nine miles from Mount Pleasant, and two miles from the ocean. As far as I am aware this is the first eastern record for this species.—ARTHUR T. WAYNE, *Mount Pleasant, South Carolina.*

Remarks on the Nest of *Cistothorus palustris*.—The nest of the Long-billed Marsh Wren is too well known to ornithologists generally to need description, but the only explanation of its globular form, which I can find, is that given by Wilson, who states: "A small hole is left two-thirds up, for entrance, the upper edge of which projects like a pent-house over the lower, to prevent the admission of rain." The inference from this and similar statements of later writers would be that the roof is built to protect the eggs from the rain. This may be partially true, but it seems strange that a species nesting at a season when violent rain-storms are least frequent should need a protection, which birds breeding earlier in the spring do not require.

But there is another danger to which the eggs of *C. palustris* are peculiarly liable, both from the character of the country in which they breed and the slenderness of the reeds which support the nest. This is the wind, which, sweeping across the exposed marshes of this Wren's summer home, often levels the rushes with the ground. I have found the reeds growing in the Quinnipiack Marshes near New Haven, Conn., where large numbers of this species breed, leveled in this manner, and the attached nests turned almost at right angles to their original position. It is evident that under such conditions the eggs in an uncovered nest would fall out and be destroyed, while in many of these nests, which had the

long axis almost horizontal, I found the eggs reposing in perfect safety. The upward trend of the entrance, forming the "pent-house" of Wilson, naturally decreases the liability of the eggs to fall out, even if the wind should force the side of entrance toward the earth. It therefore appears to me at least probable that the main object of this Wren in constructing its elaborate dwelling is protection from the wind rather than the rain.

It has also been my experience that the top of the nest is generally more firmly fastened to the reeds than the bottom, and in two instances I noticed among the partially leveled reeds nests whose bases swung free of all support, thus retaining their original perpendicular position. However, this may have been the result of accident rather than design.

The taking of three sets of white eggs, presumably of this species, may be of interest. They consist of four, five, and four eggs, and were taken on June 24, July 11, and July 28, 1893, near the edge of a small salt-water ditch in the Quinnipiack Marshes, Hamden, Conn. The nests, which are fairly typical of *C. palustris*, were not more than eight yards apart, and probably belonged to the same bird. The eggs are white, translucent when taken, irregular in shape, and several have small, roughened projections on the shell. One from the set of five has a few dark spots half concealed beneath the surface of the shell and most perceptible in holding the egg to the light.

C. palustris is the only Wren known to inhabit this marsh, and a male, which I believed to be the owner of the first set, together with a Wren which settled for an instant at the entrance of the third nest, were of this species. The character of the locality, and the large numbers of the Long-billed Marsh Wrens everywhere around, made more certain identification impossible.

The white eggs of this species which have been recorded, taken in connection with the normally white eggs of its near ally, *C. stellaris*, and the frequently white eggs of the Bluebird (*Sialia sialis*) have to my mind a peculiar importance as an additional argument for the truth of the theory of protective coloration, the covering of the nest rendering the usual dark pigment unnecessary.—LOUIS B. BISHOP, M. D., *New Haven, Conn.*

[Albinistic eggs are well-known to occur more or less frequently in birds that normally lay colored or spotted eggs, and which do not breed in holes or in covered nests; just as albinism may occur in the bird itself in any species. Why, then, should abnormally pale eggs be considered as having any special significance in the two species above cited?—J. A. A.]

Distribution of the Hudsonian Chickadee.—In his paper on 'The Hudsonian Chickadee and its Allies,' published in 'The Auk' of Oct. 1893, Mr. Rhoads makes the statement (p. 322) that "this Chickadee is a rare visitor in Manitoba, Ontario and Quebec, and for that matter, in any non-mountainous locality south of Hudson's Bay." This is entirely con-

trary to my experience. In that part of Nova Scotia that I am particularly familiar with, Annapolis, Yarmouth and Digby Counties, this bird is extremely abundant. Every autumn for the past eight years I have spent a month or more with Digby as my headquarters.

Here the Hudsonian Chickadee is rather hard to shoot owing to the nature of the country it inhabits, keeping almost exclusively in the thick second growth spruce and fir woods, but in a day's walk through their favorite haunts I never fail to see less than twenty-five or fifty and often many times that number. In October and November they are in large loose flocks in company with the Common Chickadee and the Golden-crowned Kinglet, and often the spruce woods seem fairly alive with these birds, always in motion, always passing on and on through the spruces, so fast that it is impossible to keep up to them. Often while walking through these dense forests of evergreens, suddenly as if by magic, the trees about one will become alive with these three species, their cheerful notes sounding from every branch and the next moment, as suddenly as they came, they will disappear again and leave the forest still and gloomy as before.

The country about Digby is strictly non-mountainous, and what hills there are, as the North Mountain back of the town of Digby, and the hills back of Granville on the opposite side of the Annapolis Basin, are covered with a hard wood growth, for the most part, principally beach. I never found the Hudsonian Chickadee in these woods. In fact I have never seen them except very occasionally anywhere but in the thick spruces and firs.

My own experience is, as I have stated above, confined to the autumn months, but my friend, Mr. H. A. P. Smith of Digby, N. S., who is a careful observer, tells me the bird is strictly resident and breeds abundantly.

In August and September, 1880, my brother, E. A. Bangs, was camped on the Restigouche River, N. B., and found the Hudsonian Chickadee very abundant all along the river. He got a good series of them without any difficulty.

So far from its being a rare visitor in any non-mountainous locality south of Hudson's Bay, I should be much surprised not to find the Hudsonian Chickadee abundant in any part of Canada, New Brunswick or Northern Maine, where the country was suitable to its mode of life.—
OUTRAM BANGS, *Boston, Mass.*

Notes on Some Long Island Birds.—*Empidonax flaviventris.*—Mr. E. F. Carson, of Brooklyn, has kindly permitted me to record two specimens of this Flycatcher, which he has secured in the vicinity of Brooklyn, N. Y. The first one was killed in a tree on Madison Street, in the heart of the city, on June 10, 1893; the second was shot in the woods at Parkville, Kings County, on August 19, 1893. They were both males, and the only ones we have met with on Long Island.

Empidonax acadicus.—On June 10, 1893, I shot a male of this species in tall woods covering a hillside in Woodhaven, Queens County. The bird

was feeding, and uttering a harsh, guttural note. At about the same date the previous year, and in the same woods, I heard the note of a Flycatcher which I supposed to be also of this species. Both of these appeared to be living in the immediate neighborhood, so I judge that they were breeding, although a brief search failed to reveal either nest or mate.

The two birds mentioned above are the only ones of the species I have ever seen on Long Island, but through the courtesy of Mr. William Dutcher, I am enabled to present the following additional information.

In 1879, Hon. Theodore Roosevelt published a brief paper entitled 'Notes on Some of the Birds of Oyster Bay, Long Island,' in which he says of the species, "rather common summer resident; much less so than the *minimus*. Frequents the dry, rather dense woods, keeping in the underbrush and among the lower branches of the trees. In autumn, I have found the curiously-banded young, associating with various warblers; otherwise they are solitary birds. Is more restless than the *trailli*. It has a querulous note, sounding like 'queech,' or 'qu-eech,' which it utters repeatedly and rapidly."

In 1888, Mr. Alfred Marshall found the bird breeding. Following is a copy of a letter written by him to Mr. Dutcher. He says, "I enclose letter of Capt. Bendire, identifying the eggs and nest as Acadian Flycatcher. They were found June 17, 1888, at Northport, L. I. The nest was placed in a dogwood tree, about ten or twelve feet from the ground. It was in quite deep woods and about one hundred yards from a grass field. The nest is composed of bark of cedar, and is lined with weeds. The bird was very shy, and it was about an hour before I saw her at all."

From the records I have given, it will be seen that the Acadian Flycatcher is apparently confined on Long Island, to the heavily wooded districts of the north shore, where it is a regular and perhaps not uncommon resident.

Helminthophila chrysoptera.—Mr. J. P. Giraud, Jr., in his 'Birds of Long Island,' published in 1844, says of this bird: "On Long Island this species occurs only in small numbers, and according to my observations, is not an annual visitor." Since the publication of Mr. Giraud's work, I know of no published records of this species. I have myself secured but one specimen. This was a fine male which I killed at Parkville, Kings Co., on May 11, 1893; it was shot from a low limb in the tall woods, where it had apparently just alighted from a more or less extended flight.

There is a single specimen in the Lawrence collection, a male, collected by J. F. Ward, Aug. 15, 1831.

Mr. Roosevelt, in the paper previously referred to, says that he has "shot it but once, May 10, 1878."

Mr. Dutcher has one specimen in his collection, which was presented to him by Mr. John D. Hicks. It is a male, and was killed at Old Westbury, Queens Co., in the spring of 1880.

Helminthophila peregrina.—In 'The Auk' for April, 1889 (page 138), Mr. William Dutcher has given the only records of this bird from Long

Island; he mentions, in addition to the single specimen in the Lawrence collection, four specimens in his own collection, all received from the light-houses in the month of September.

I shot my first and only specimen in a low second growth tract of oaks at Lake Grove, Suffolk County, on Sept. 20, 1893. It is a young male.

Sylvania mitrata.—Since my previous record of this bird (Auk, Vol. IX, p. 306), I have secured another specimen, an immature female, in almost the identical spot in Parkville where I shot the first one, which was an adult male. The first specimen was killed April 30, 1892, as it alighted on the track of a railway which passes through the woods; the second one was shot May 15, 1893, as it was feeding in the lower limbs of the trees.

Mr. Dutcher has two specimens in his collection, one of which he has recorded (Auk, Vol. VI, p. 139); the other was killed at Shelter Island, May 16, 1891.

Mr. J. C. Knoess, the taxidermist of Riverhead, has one very fine specimen in his collection.

These, with two specimens in the collection of the Long Island Historical Society (Auk, Vol. X, p. 277) and two in the Lawrence collection, make in all nine recorded specimens from Long Island.—ARTHUR H. HOWELL, *Brooklyn, N. Y.*

Stray Notes from Massachusetts.—*Branta canadensis*.—Ponkapog Pond, Mass., Oct. 20, 1893. First Canada Geese seen in this locality this season; six birds. The next noted were twenty, on the 25th. These last were very tired.

Larus argentatus smithsonianus.—Oct. 22. A large movement of American Herring Gulls towards the southwest; weather fine and warm. White and gray plumaged birds were noted passing high up over the pond; one flock of twenty-two were flying in form of a harrow. The flocks varied from three or four birds to forty each. Between three and four hundred were estimated to have passed.

Charitonetta albeola.—Oct. 30. The first Buffle-heads this season were noted here to-day; no others have been seen, which is very unusual. Three birds noted up to Dec. 1st.

Fulica americana.—Sept. 19. The first American Coots, eighteen, seen to-day; six were shot. It is an unusually early date for them here.

Dafila acuta.—Sept. 21. An immature bird shot to-day.

Pandion haliaëtus carolinensis.—Sept. 22. Eight Fish-hawks passed over the pond to-day.

Spatula clypeata.—Sept. 25. One immature Shoveller Duck shot to-day.

Philohela minor.—Oakham, Mass., Oct. 15, 1893. Mr. J. F. Brown of Chelsea, Mass., informs me that in company with Mr. John Stone of Oakham he visited daily the Woodcock grounds in the vicinity of Oakham for fifteen consecutive days, commencing on the above date, but

failed to find only a very few birds, although the grounds were extensive. Mr. Stone has shot over this ground for twenty-five years and this is the only year in his experience that no defined flight of Woodcock has been noted by him. From what I have learned I am of the belief that the flight in Massachusetts passed during the last few days in September and first few days in October.

Sterna tschegrava.—Cape Cod, Mass., Sept. 20, 1893. Two Caspian Terns recently came into my possession which were taken on or about the above date. Both birds proved to be females on dissection, one being an adult, the other immature.—GEORGE H. MACKAY, *Nantucket, Mass.*

Effect of the Great Cyclone of August 26-27 upon Certain Species of Birds.—The cyclone which devastated the coast of South Carolina was the most destructive which has ever been recorded. About 3 o'clock P. M., a Frigate Bird (*Fregata aquila*) was seen, and shot at twice but unfortunately was not secured. A few days after the cyclone I made a trip to Long Island, S. C., which lies east of Sullivan's Island, and saw and examined countless numbers of *Puffinus major* dead upon the beach. Only a single example of *Puffinus auduboni* was observed, while a great many *Pelecanus fuscus* were found strewn along the beach for miles. Royal Terns (*Sterna maxima*) were shot at Barnwell C. H., which is about eighty-five miles from the sea.—ARTHUR T. WAYNE, *Mount Pleasant, South Carolina.*

CORRESPONDENCE.

[Correspondents are requested to write briefly and to the point. No attention will be paid to anonymous communications.]

Popular vs. Scientific Ornithology.

EDITORS OF 'THE AUK':—

Dear Sirs,—Mr. Brewster's gentle admonition in 'The Auk' of October last (Vol. X, p. 365) seems to call for an explanation of my position. The reasons I turn more readily to a literary than to a scientific channel of expression are several, not to speak of the fact that I am naturally of literary rather than scientific proclivities. There is, first, my great desire to bring into the lives of others the delights to be found in the study of Nature, which necessitates the using of an unscientific publication, and a title that shall attract, even though it may, in a measure, "ambush" my subject.

Again, never having studied scientific ornithology, and having no time at present if I had the wish to do so, and, moreover, having an intense love of live birds, and an almost Buddhistic horror of having them killed, I must admit to feeling the least bit out of my element among those who—to put it mildly—feel otherwise. Let those who will spend their days killing, dissecting and classifying; I choose rather to give my time to the study of life, and to doing my small best toward preserving the tribes of the air from the utter extinction with which they are threatened.

And lastly, a confession: I should take pleasure in “sharing my discoveries” were I so happy as to make any; but to me everything is a discovery; each bird, on first sight, is a new creation; his manners and habits are a revelation, as fresh and as interesting to me as though they had never been observed before. How am I to tell what is an old story and what a new one? What to announce in a scientific journal, and what to proclaim with delight to my fellow ignoramuses?

I could study; I could learn? Doubtless; but that would take the enthusiasm out of my work. Could I enjoy and sympathize with the raptures of a little pair in feathers, if my mind was filled with doubts and queries as to their proper niche in the world of classification?—if I concerned myself about the number of their tail feathers, the exact shade of their plumage, or whether they were a species or a subspecies, and entitled to two or three Latin names?

No—forever no! Study these things who will. I study the beautiful, the living, the individual bird, and to my scientific confreres I leave his skin, his bones, and his place in the Temple of Fame.

OLIVE THORNE MILLER.

Brooklyn, N. Y., Nov. 7, 1893.

NOTES AND NEWS.

CHARLES SLOVER ALLEN, M. D., an Associate Member of the American Ornithologists' Union, died in New York City on October 15, 1893, after a brief illness. Dr. Allen was born at New Bern, North Carolina, in 1855. After graduating with honors from Columbia College, New York City, he studied medicine under Dr. James B. Wood and obtained his degree of Doctor of Medicine from Bellevue Hospital. As the result of a competitive examination, in which he took the highest rank, he was appointed interne in the Charity Hospital on Blackevell's Island. At the completion of his term of service in this institution, he went abroad and continued his studies at Heidelberg.

On returning to New York City he was associated with Dr. James B. Wood and later established an office of his own at 21 East 28th Street, which he occupied at the time of his death. In the treatment of throat, nose, and ear affections Dr. Allen was notably skilful and he held the position of clinical lecturer on the diseases of these organs in the Medical Department of the University of the City of New York.

Dr. Allen was born a naturalist and only the duties of an unusually busy professional life prevented him from taking high rank as an original investigator in some branch of natural history. As a naturalist his tastes were of the broadest. Every object in nature had for him a fascination which impelled him to study the animate or inanimate with equal ardor.

His more recent natural history work had been largely confined to investigations of the toxic power of snake venom with the particular object of discovering an antidote for this virile poison, but he never lost interest in his study of birds and their habits, and to the readers of 'The Auk' he will best be known by his admirable articles on the Fish Hawk and Black Duck (Auk, IX, pp. 313-321, and X, pp. 53-59). His note-books were filled with equally interesting material which it is to be regretted will now never see the light.

Dr. Allen was a rarely genial comrade. In the field no misfortune was great enough to dampen his enthusiasm, and his generous disposition always prompted him to sacrifice himself for the good of his companions. Indeed his presence on an expedition was an assurance that it would be both a pleasant and successful one.

THE A. O. U. Committee on Bird Protection made, through its Chairman, Mr. George B. Sennett, its usual report at the Eleventh Congress and asked to be discharged, the need for such a Committee being considered no longer urgent, of late its function having been mainly advisory and its services not often required. As most of the States have now enacted excellent statutes for the protection of birds, modelled to a large extent upon suggestions advanced by the Committee, little more than their proper enforcement is now necessary. In recognition of its important services to the cause it was designed to aid, during a continuous service of ten years, the Union acceded to its request, accompanying its discharge with a vote of thanks. Later, in view of certain contingencies it was thought might arise, however, it was deemed desirable to have the Union represented officially by a committee that could act in its behalf, and a new 'Committee on Protection of North American Birds' was appointed, as follows: Frank M. Chapman (Chairman), Charles E. Bendire, Montague Chamberlain, Jonathan Dwight, Jr., and L. S. Foster.

AT THE Eleventh Congress of the A. O. U. the Union authorized the preparation of a new 'Check-List of North American Birds,' the original edition having been for several years out of print. The purpose of the

new edition is to duly incorporate with the original edition the numerous additions and nomenclatural modifications contained in the six 'Supplements' that have appeared since the publication of the original edition, and to revise and give more in detail the 'habitats' of the species and subspecies, rendered possible through our greatly increased knowledge of the geographical distribution of our birds during the ten years that will have elapsed between the publication of the two editions. For this purpose it was thought desirable to place the work as nearly as possible in the hands of the original 'Committee on the Classification and Nomenclature of North American Birds,' which was accordingly reappointed, with a single substitution, as follows: Elliott Coues (Chairman), J. A. Allen, William Brewster, C. Hart Merriam, and Robert Ridgway; Dr. Merriam thus taking the place of Mr. Henshaw, in view of the probable inability of the latter to serve, owing to prolonged absence in the West. It is not expected that the new edition will be ready for the press till early in 1895.

OWING to the pressure of other engagements, Mr. Charles F. Batchelder declined reappointment as Associate Editor of 'The Auk,' and the place was filled by the selection of Mr. Frank M. Chapman. Mr. Batchelder had filled the position so efficiently for a period of six years that his declination was accepted with sincere regret, not only by the Editor-in-Chief, but by all the members of the Council, with whom rests the selection of the Editorial Staff, his attention to all the details of publication having been unremitting and most satisfactory.

WE HAVE received a prospectus of 'A Monograph of the Coraciidæ, or Family of the Rollers.' The work will be published by the author, Mr. Henry E. Dresser, author of 'The Birds of Europe,' 'A Monograph of the Meropidæ,' etc., in an edition limited to 250 copies. The size will be imperial quarto, and the work will give "as complete an account as possible of all the known species of these richly colored birds." The plates have been drawn by Mr. J. G. Keulemans, and will be hand-colored. Intending subscribers may address the author, Topclyffe Grange, Farnborough, Kent, England.

THE NEW YORK ACADEMY OF SCIENCES has recently published in its 'Transactions' the report of the Audubon Monument Committee, appointed in October, 1887, to secure funds for the erection of a monument over the grave of the distinguished ornithologist John James Audubon. The report (*Trans. N. Y. Acad. Sci.*, Vol. XIII, pp. 23-65, Nov. 1893) contains, besides an account of the proceedings of the Committee (pp. 23-30), and as accompanying documents, the addresses in full made at the unveiling of the Monument, April 26, 1893. These were by Prof. Thomas Egleston, Chairman of the Committee, in behalf of the Academy presenting the monument to the Corporation of Trinity Church (pp. 30-36), and the reply of the Rev. Morgan Dix, D. D., accepting the monu-

ment in behalf of Trinity Church (pp. 37, 38); also the proceedings of the special meeting of the Academy held at the American Museum of Natural History on the evening of the same day. These include a brief address by President Morris K. Jesup of the Museum; the reading of some extracts from unpublished letters of Audubon by President H. Carington Bolton of the Academy; a short address by Prof. Egleston, and a memorial address on 'The Life and Services of John James Audubon' by Mr. Daniel G. Elliot (pp. 43-57),—a well-delivered and very just tribute to the memory of the great painter-naturalist. Following the address is a list of the contributors to the monument fund, several hundred in number. The proceedings will be separately issued for distribution to the contributors to the fund.

'THE NIDIOLOGIST,' an illustrated monthly magazine devoted to ornithology, is published and edited by Mr. Henry Reed Taylor, at Alameda, Cal. It is one of the youngest of the numerous aspirants to fame in the field of ornithology, the fourth number bearing the date of December, 1893. The matter and the photo-engravings with which it is liberally illustrated are of good quality, and, trusting it will maintain its present high standard as a popular magazine of ornithology, we give it a hearty welcome and wish it the success it thus far so well deserves. Among its contributors we notice the names of a number of well-known ornithologists.

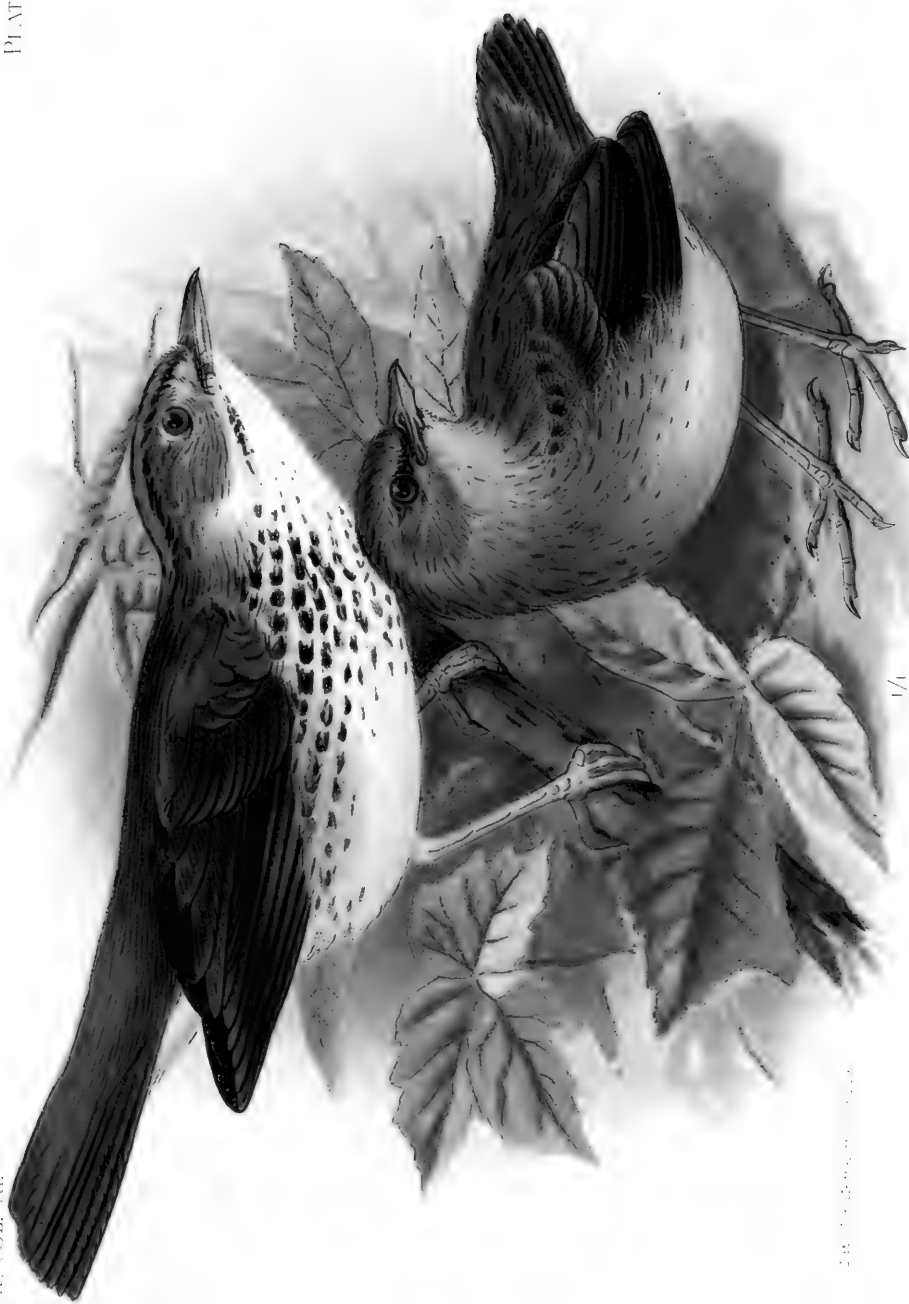
THE COOPER ORNITHOLOGICAL CLUB was organized at San José, Cal., June 22, 1893, which "all honest ornithologists in California are invited to join." A report of the regular monthly meeting held Nov. 4 last, by the Secretary, Mr. C. Barlow, of Santa Clara, Cal., occupies nearly two pages of the December number of 'The Nidiologist,' from which it appears that several papers of much interest were presented, and quite a list of papers is announced for the meeting of December 2. Such an organization cannot fail of affording great benefit to its members and of promoting the study of Californian ornithology.

THE CONGRESS ON ORNITHOLOGY, held in Chicago, under the auspices of the World's Congress Auxiliary, Oct. 18-21, 1893 (see *Auk*, X, pp. 386, 387), proved a very gratifying success, considering the short time allowed for its organization and development, the interest shown and the size of the audiences in attendance more than exceeding the expectation of the promoters of the enterprise. The program contained a list of some thirty papers, the general character of which is shown by the following titles of some of the papers presented. Opening address by the Chairman, Dr. Elliott Coues; The Migration of Birds, J. A. Allen; The Ornithology of Columbus's First Voyage, Frank M. Chapman; On the Destruction of Birds, Dr. D. Webster Prentiss; The Red-shouldered Hawk in Captivity, Harry C. Oberholser; The Effect of the Introduction of the Mongoose on

the Fauna of Jamaica, W. I., W. E. D. Scott; Birds of British Guiana, J. J. Quelch; Ornithology in Our Schools, Abraham H. Bates; Kinship of Birds as shown by their Eggs, J. N. Baskett; Bird Observations, or When, Where and How to see Our Birds, O. B. Warren; Instinct in Birds, J. H. Bowles; Changes of Habits in Certain Species of Maine Birds, Manly Hardy; Slaughter of the Innocents, Leander S. Keyser; Some Recent Economic and Scientific Questions in Ornithology, Dr. R. W. Shufeldt; The Range of the Crossbills (*Loxia*) in the Ohio Valley, Amos W. Butler; To the Rescue of the Birds, Hortensia M. Black; Some Notes on the Herons of Central Florida, T. Gilbert Pierson; Popular Names of Birds, William E. Praeger. The success of the Congress was largely due to the efforts of Dr. Coues and Prof. S. A. Forbes, and especially to the efficient and untiring assiduity of the acting Secretary, Mrs. E. Irene Rood of Chicago. The papers, as may be inferred from their titles, were properly of a popular character and well adapted to stimulate interest in ornithology and in the better protection of bird life.

MR. FRANK M. CHAPMAN, of the American Museum of Natural History, New York City, will return to the Island of Trinidad about the end of January to resume his study of the Fauna of the Island, especially its mammal and bird life. The results of his last year's work on the mammals have been published (Bull. Am. Mus. Nat. Hist., V, pp. 203-224), and a very extended report on the birds is ready for the press, and will probably be issued in February of the present year.

AMONG the courses of popular lectures given free to the public at the American Museum of Natural History in New York City is a course on 'Birds of the Vicinity of New York City,' by Mr. Frank M. Chapman, Assistant Curator in the Department of Ornithology. The lectures of this course will be given on Saturday afternoons in January, 1894, and will be followed by other courses in February, March, and April by other Curators or their assistants, on Mineralogy, Mammalian Palæontology, and Entomology, in each case the lectures being illustrated by specimens from the collections to which they relate. The experiment of giving popular lectures to people earnestly in search of natural history information was first tried last year, and the success attending last year's courses shows that the efforts of the Museum authorities to popularize natural history are well appreciated. The ornithological course will comprise four lectures, as follows: I, Why we Study Birds, How to Study Birds, Our Winter Birds. II, The Birds of March, April and May, and the Spring Migration. III, The Birds of Summer, Birds' Nests, Birds' Songs. IV, The Birds of Fall and the Fall Migration, Birds in their Winter Homes.



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OVEN BIRD (SEIURUS AUROCAPILLUS).

W. W. BROWN, DEL.

THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. XI.

APRIL, 1894.

NO. 2.

FIRST PLUMAGES.

BY J. A. ALLEN.

Plate II.

IN PLATE II of this number of 'The Auk' is given the first of a series of plates intended to illustrate the first or nestling plumage of various North American birds. The Ovenbird (*Seiurus aurocapillus*) is the subject chosen for the present plate, in which is shown the adult bird and the young just from the nest.

As is well known, the first plumage is worn for only a few weeks, to be succeeded by a plumage of quite different character, as regards, usually, both its structure and coloration. It also differs widely in character in different groups of birds. In the Owls, Hawks, Gallinaceous Birds, Snipes, Rails, Ducks, Grebes, and most Water-fowl, it is little more than a thick covering of fluffy down. This is succeeded by a covering of true feathers, which is, as a rule, worn till the moulting season of the following year. In all these birds the first downy plumage is present when the chick is hatched. On the other hand, all Passerine birds, and many others, as the Woodpeckers, Swifts, Pigeons, etc., are born practically naked, and their first clothing consists of true feathers, which develop while the bird is a helpless

nestling; the clothing feathers being nearly full-grown when the young bird leaves the nest, while the flight feathers are only partly so. The first flight feathers may be moulted in a few weeks, or be worn during the first year, even in species not distantly related. Thus in the Woodpeckers, the Cowbird, and the Horned Larks they are moulted in the course of a few weeks, with the first clothing feathers, while in the Sparrows and in most Passerine birds they are not renewed till the following summer.

Speaking generally, the first clothing feathers in Passerine birds are replaced by a more permanent set soon after the young bird leaves the nest. This 'first' or 'nestling' plumage can usually be recognized by its loose, fluffy texture, as compared with that of adult birds of the same species, even though the coloration may be similar; but generally it differs notably also in color, and often in pattern of markings, from that which immediately succeeds it, or from any plumage which may be afterward acquired. Familiar illustrations are furnished by the Robin and the Bluebird, where the first plumage is so strikingly unlike, both in color and markings, that of the adult bird of either sex. The difference is almost as great in many of the Sparrows, as, for example, in the Juncos and Towhees, and is even conspicuous in such species as the Field and Chipping Sparrows.

Although this first plumage is particularly interesting and instructive, affording frequently clues to ancestral relationships, it has not until recently attracted the attention it deserves, even among 'professional' ornithologists. Fledglings, as a rule, have not been looked upon as attractive additions to the cabinet; and being furthermore rather difficult to prepare as specimens, on account of the loose texture of the plumage and the tenderness of the skin in young birds, they have not proved attractive to collectors. Of late years, however, their importance has been more fully recognized, and 'first plumages' are now considered as an essential feature of a collection, even by amateurs, and are not unfrequently kept in stock by dealers.

Some years since attention was called to this long-neglected subject by Mr. William Brewster, through his series of papers published in the 'Bulletin' of the Nuttall Ornithological Club

(Vol. III, 1878, pp. 15-23, 56-64, 115-123, 175-182, and Vol. IV, pp. 39-46), entitled 'Descriptions of the First Plumage in Various Species of North American Birds,' in which the first or nestling plumage of 119 species was for the first time described. Casual descriptions of the first plumage in various other species have since appeared, as well as a formal paper by Mr. George B. Sennett (*Auk*, IV, 1887, pp. 24-28), treating of ten additional species. The first plumage in very few North American birds, however, has thus far been figured, and the capabilities of the subject in other respects have as yet been by no means exhausted.

While in some species the young in first plumage bear a close resemblance in color to the adults, as in some of the Flycatchers, Jays, Chickadees, Vireos, etc., in other cases they are so totally unlike the adults as to be sometimes identifiable with difficulty even by experts, and only by structural characters rather than by plumage, as in various Warblers and Sparrows, as is well shown by the subject of the present illustration. The first plumage is thus often exceedingly characteristic, closely allied subspecies sometimes differing more at this early stage than at any later period. Its real significance, however, has as yet been little studied.

Although the Ovenbird is so common and well-known a species, probably few ornithologists even have seen it in first plumage. As shown in the illustration, it lacks all of the characteristic tints and markings of the adult, the quills of the wings and tail being the only portions of the plumage that resemble corresponding parts in the adult. There is no trace in the young bird of the prominent black and dull orange head-stripes of the mature bird. The back is deep brown with narrow streaks of blackish instead of uniform bright olive-green as in the adult. The lower parts, instead of being nearly clear white heavily streaked with dusky, are strong buffy, darkest across the breast, with very narrow lines of blackish. From this plumage the young bird moults directly into that of the adult, the young in autumnal dress being quite indistinguishable from the older birds. The quills, however, are not moulted till the following year. The young bird represented in the plate was drawn from specimen No. 27,246, in the collection of the American Museum of Natural History, and was collected at Hartsdale, N. Y., by Mr. J. Richardson.

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

BY LEVERETT M. LOOMIS.

CONCLUDING OBSERVATIONS ON MIGRATIONS.¹*III. Migration Considered with Reference to Cause.*

IN the study of bird migration we find two sources of causation — physical and psychological; the former embracing the conditions entailed by winter, cold and failure of food, necessitating southward migration and restraining northward; the latter, the adaptation to these conditions, implying education and probable heredity. The physical, as the primary or fundamental cause, will be considered first.

Physical Cause.—As a statement of the phenomena of migration is largely a statement of its physical cause, it may be well to pass in review the cycle of a year's migration.

June 20 may safely be said to mark the opening of the southward migration in this region, the scarcity of adult birds in a few species, whose breeding season is over, then becoming apparent. Mr. Brewster assures me that the date of inception of this early movement of adult birds in Eastern Massachusetts is about July 20 — a month later than in the Piedmont and Alpine Regions of South Carolina. In July, particularly toward the end, arrive the first Warblers that do not breed, so far as known, in Chester County. As the Southern Alleghanies are a part of their breeding habitat, the movement is presumably from these highlands. Breeding birds continue to depart during this month, and toward the close a few species have nearly or entirely disappeared, both the old and the young. In July, too, representatives of some of the species breeding here make their appearance from other localities, inaugurating the fluctuations noticeable in all the movements that follow, whether of breeding or of strictly transient species. The waves of migration become pronounced

¹Concluded from p. 39.

by August. Fluctuations in breeding species — with marked intervals of paucity — are conspicuous features of the month's movements. Some of these birds of the breeding season, as the waves pass southward, rise in the scale of abundance, while others fall far short of their former numbers. Certain species that disappeared after their season of reproduction now reappear. A number of new arrivals make their appearance, mostly mountain breeding species, and birds whose first coming was in July occur at intervals in increased abundance, and at the close of the month late breeders begin to take their departure.

I have spoken of the early migration of Northern Phalaropes at Monterey Bay, California, and of a deflected movement of Dark-bodied and Pink-footed Shearwaters. On the 27th of June it was discovered that there was a considerable movement of California Murres going on. Like the Phalaropes and Shearwaters they moved rapidly southward parallel with the line of the coast. Aside from the California Murres, the July movements were confined, so far as determined by my observations, chiefly to the Western Gull and Heermann's Gull. In both the migration was one mainly of adult birds. The former species grew less and less numerous, and immature birds began to preponderate at the end of the month. Two large flocks of adult Heermann's Gulls, of both sexes, appeared on the 15th. They were the first I had seen, except several in dark plumage. As the month advanced adults rapidly increased. On the 27th I wrote in my journal, "This species is the most abundant Gull on the Bay. The dark phase, however, is not very plentifully represented, though birds of this style are becoming more numerous." California Murres continued to migrate south through July. Some days were days of marked migration. The first female was taken on the 11th. Females, however, did not become numerous until August, the earlier movements being apparently of males. July 18 an adult female Western Sandpiper was shot. On the 23d a few Wandering Tattlers appeared along the shore on the rocks just beyond the reach of the surf. A week later they were greatly reënforced, being generally distributed along the rocky shore. Their presence I attribute to migration. This assumption is corroborated by the character of the arrivals of the next few days.

August 1 the Northern Phalaropes appeared as reported. A Pomarine and a Parasitic Jaeger were taken, and a second specimen of the latter seen. There was a succession of California Murres, individuals and small parties in single file, passing down the coast, not nearer than a mile to the land, all the time I was out on the Bay, which was during the forenoon and mid-day. There was an equally great flight of Marbled Murrelets. They came rapidly from up the coast and disappeared to the southward. They flew usually in couples. There were young birds as well as old. Not more than half a dozen were seen on the water. The adults on the water took wing readily, but not so the hornotines, which dived to escape pursuit. The same was found true later in the Pigeon Guillemot. The young seemed to lack wing power, one Guillemot actually fell back into the water after getting partially under way. Such incidents afford a fair key in some cases to the seeming prior occurrence of young birds in the southward movement (the weak-winged drop out of the race), and emphasize the fact that departure from breeding grounds is the true criterion by which to determine the order of migration in the young and old. Dark-colored Heermann's Gulls outnumbered the adults, proving an influx in this species from another locality.

August 2, as I have stated, large numbers of Northern Phalaropes passed southward. Several Pomarine and Parasitic Jaegers were observed. In the California Murre and Marbled Murrelet there was a falling off, there being but slight movement in either. On the 4th occurred another wave of California Murres and the passage of Shearwaters described under deflected migration. Several Belted Kingfishers were noted on the 5th occupying rocks where the surf was not heavy. As only one had been seen previously about the Bay their presence was imputed to migration. The morning of the 6th many Pigeon Guillemots were found on the water just beyond the kelp. Most of them were adults. There had evidently been a movement during the night, for before this only six had been noted, and those birds-of-the-year during the latter half of July. Quite a number of Dark-bodied and Pink-footed Shearwaters were observed some three miles out from land. All were heading southward. In the middle of the day, flocks of Gulls passed

southward along the shore, not far out from the surf. Many were immature Western Gulls. The others were chiefly Heermann's. August 10 dark birds and those with mottled heads were the Heermann's Gulls principally seen. There was an extensive movement of Shearwaters on this day. As it was foggy many came within a mile of the land. The majority were several miles out, however. The bulk appeared to be the Dark-bodied. One Black-vented Shearwater was secured. About half a dozen Pomarine Jaegers were noticed. A good many companies of Northern Phalaropes were flying seaward. A few Marbled Murrelets were also migrating.

August 11 was a day of little migration. Just off the buoy at Point Pinos there was a great raft of Brandt's Cormorants on the ocean. This was the first gathering observed on the water, indicating that the rookeries were breaking up. There was a rookery south of Point Pinos. The 12th was the great day of migration in the Northern Phalaropes. There was a dense fog over the Bay in the morning, and it had the effect to crowd migration toward the shore. In my journal I find the following note on the California Murre: "Many groups and individual birds were scattered over the water. Their cries sounded strangely in the fog. Their migration was perhaps interrupted by it, as I have never seen so many before on the water." There was little movement manifested from the 15th to the 22d—my last day of observation. Up to the 16th only adult California Murres in breeding plumage were taken. On that day a single hornotine was secured, and on the 20th a second one. A pair of adults with mottled throats, etc., were shot on the 19th.

The occurrence in considerable numbers of White-winged and Surf Scoters (old birds) in June and July off the sandy beaches presents an interesting theme for inquiry. Of nine specimens shot June 23, all were females—seven of the former and two of the latter species. They were in very ragged and faded plumage. Some were unable to fly as the remiges had been moulted. The ovaries, too, were in a very low stage of development. These remarks will also apply to the condition of examples taken later. The only drake secured was a Surf Scoter, July 8. It remains to be determined whether such

early Scoters are, or are not, south-bound migrants. It is certain that the individuals captured were not wounded birds ('pensioners'), and on that account unable to perform the migration to their breeding grounds. Observations through May and June would throw light upon the matter.

A comparison between the southward movements of water birds in June, July, and August at Monterey Bay with those of the smaller land birds in Chester County discloses a striking similarity. There were the migration in some species of adult birds soon after their breeding season, the fluctuations, and the arrival of birds that breed wholly to the northward.

Mr. Murdoch speaks of early southward movements at Point Barrow, Alaska (Ray's Rep. Exped. to Pt. Barrow) occurring during the latter part of July. Judging from some of his annotations the first week of the month is perhaps the beginning of such migration. So far as definitely indicated, the adults migrated before the young.

The following from Dr. Coues's 'Notes on the Natural History of Fort Macon, N. C.' (Proc. Acad. Nat. Sci. Phila., 1871, p. 31) is so pertinent that I reproduce it in full: "The beach and marsh are cleared of all their sandpipers about the first of June; and, for some six weeks, scarcely a straggler of any sort is to be seen. But about the middle of July—a few days before or after the 15th—a few of this and the next species [Least and Semipalmated Sandpipers] reappear, and in August the numbers are materially increased, still in advance of the main body of September arrivals."

In Chester County, through September, breeding residents and residents fluctuate with the arrival and departure of waves. The majority of the former decrease permanently before the month ends, and some finally disappear. Except a single species, the last depart in October, several lingering almost to the end of the month. Many of the residents gain in abundance in September. Species whose advent was in August are then in the ascendancy among transients. Their numbers vary as the successive waves pass southward. Extreme abundance is attained by some of the earlier transients. The additional species make their appearance chiefly after the first week. In most instances they come to their full measure of abundance in October. In October

winter species from the outset almost entirely supersede the transients as first arrivals. Usually a few transients still occur numerously at the middle of the month. Quite a number linger through the third week, some of them being fairly plentiful. The closing week stragglers only are to be found. With perhaps a few exceptions, the ordinary winter species are represented during the closing fortnight—some in abundance. During the first half of November most winter species reach their maximum abundance, which is followed by the decline to winter numbers. This diminution begins in a few even before October is gone. Stragglers linger into November, mainly birds that winter in the country below. A mild season tends to prolong their stay, and to induce certain other species to remain further north than is their wont.

So far as I have learned from the literature, migration in August, September, October, and November in the more northern Atlantic States does not differ in general character from migration in Chester County. There is difference in times of occurrence and in species. The Canadian element appears to be more prominent at the outset (Brewster, 'Bird Migration,' p. 16), and the later movements bring boreal birds that rarely if ever penetrate to the Carolinas.

At Point Barrow (Murdoch, l. c.) the height of the southward migration appeared to be through August and early in September. Until late in October, when the sea began to close, there was still some movement. Several swimming species remained in considerable numbers as long as there was any open water, as late as December.

In Chester County, December and January are months when the southward and northward movements contend for the mastery, there really being no cessation of migration, the migratory waves in some species, particularly those wintering mainly further north, setting alternately southward and northward as the weather is severe or mild. Snow has great influence on the ground-feeding birds in this locality as well as above it, covering up the food-supply and forcing them southward. Protracted warmth in these two months causes some winter species to grow scarce, while others that ordinarily winter more abundantly in the region immediately below are greatly reënforced, the north-

ward movement gaining the ascendancy. These local occurrences appear to be a fair illustration of what takes place throughout the temperate portions of the continent under like meteorological conditions. The retarding of southward migration through warmth has been alluded to. In the 'Report on Bird Migration in the Mississippi Valley' (pp. 26, 27) an instance is cited as occurring during November and December, 1883, the effect of the mild season being reported in Dakota and in localities southward.

As has been seen southward migration is a gradual depopulation, beginning north and south before August and extending over nearly half the year. A survey of the bird fauna of the continent during the dead of winter shows that the great mass of bird life of the breeding season has been shifted southward, equalizing distribution so as to meet the conditions of winter. The hyperborean regions are depopulated, save by the few land birds that can find subsistence, the closing of the sea forcing water birds southward. As the supply of food is shorter in winter than in summer there is depletion through migration even in as hardy a species as the Snowy Owl. What transpires in Arctic regions also occurs in a lesser degree far to the southward. In the colder portions of the United States there is likewise the total migration of some species of the breeding season and the partial migration of others. Besides, there is the occupation of the territory evacuated by the birds that come from further north, that find food where insectivorous species would probably perish for lack of it, if not from cold. Upon the whole the aggregate of birds is greatly diminished. Further south, as in upper South Carolina, bird life is as abundant in winter as in summer, but the character is changed, insectivorous species, especially, giving place to those that are not dependent upon insects for food. The infrequency of snow in this region makes possible the presence of species in great abundance that occur only in limited numbers further north. As is the case to the northward, numerous resident species are less plentiful in winter than in summer. It should be observed that a species may be resident in the Middle States, or even further north, and yet be less numerous in the Piedmont Region of South Carolina in winter than in summer, there being migration at the South as

well as at the North in a species that is resident in both sections. The Blue Jay and Cardinal are examples. This obviously prevents over-crowding. Southern Florida, the Bahamas, West Indies, Mexico, Central and South America receive the surplus population from the northward. As the continental land area north of the Tropic of Cancer is so great, being about three times larger than that south of the Tropic of Capricorn, and as Central America and about half of Mexico are the only parts of the continent within the tropics, it is not surprising that the periodic flight from northern winter should extend far into South America.

In short, the population is lessened where the necessities are greatest, and changed in character where food is plentiful, apparently because the food is not suitable and because room is needed for those coming from above.¹ Whether it be the migration of the Plumed Partridge from the eastern slope of the Sierra Nevadas across the summit to the western slope, or whether it be the migration of the Brown-headed Nuthatch from the mountains of the Carolinas to the lower country, or of the adults of the Louisiana Water-Thrush before the close of June, or whether it be the migration of the American Pipit with the advent of snow, or of the Snowflake from hyperborean regions to the more northern portions of our country, or of

¹The breeding land birds of temperate South America seem to find ready means of subsistence after summer without partial migration into North America, ample accommodation apparently being found by indigenous migrants, for there are indeed refugees from southern winter, numerous species migrating northward. See Sclater and Hudson's 'Argentine Ornithology.' The distribution of land probably accounts for the absence of such transmigration, for over two-thirds of the southern continent lie within the tropics. Among oceanic birds, Mr. Brewster has shown the high probability of a migration northward from an antipodean breeding habitat in at least one species of the family Procellariidæ; viz., Wilson's Petrel. See Proc. Bost. Soc. Nat. Hist., XXII, Oct., 1883, pp. 403, 404. Rev. A. E. Eaton's discovery of the breeding of this species during January and February on Kerguelen Island (Saunders's 'An Illustrated Manual of British Birds,' p. 730) bears out Mr. Brewster's conclusions.

There is some migration, at least, in breeding birds in tropical regions, but how far the presence of winter birds is compensated for has not been determined. Mr. Chapman mentions three species that are found in Cuba only during summer (Bull. Am. Mus. Nat. Hist., IV, p. 284), and Mr. Ridgway in writing of the migration of Hummingbirds (Rep. U. S. Nat. Mus. for 1890, p. 267) speaks of "slight migrations when the food supply of a given locality fails them, or when, on high mountains, the increasing cold forces them to descend to the warmer slopes and valleys."

Leconte's Sparrow from the interior to the South Atlantic States, or of the Bobolink in middle latitudes across the equator, or of the American Golden Plover from Arctic far toward Antarctic regions, the result is, that the life of the north is so adjusted that the dearth of winter is avoided.

The following description of the northward movement is based chiefly upon my 'Observations on Migrations' (Auk, IX, pp. 30-33) and upon the 'Study of the Bird Waves which passed up the Mississippi Valley during the Spring of 1884' (Rep. Bird Migr., pp. 25-37). While the southward movement, save in its latter stages in the case of prolonged warmth, is an uninterrupted evacuation of the region that cannot be held in winter, the northward movement is a reoccupation that is successively obstructed, interruption finally ceasing only when the bands of winter are broken in Arctic regions. Mallards, Canada Geese, etc., among water birds, Robins, Red-winged Blackbirds, etc., among land birds persistently press against the barrier of snow and ice, following in its wake as it recedes northward and retreating for the time being as it temporarily advances southward. Behind these come other birds of the same species in greater abundance, and White-throated, Song, and Field Sparrows, Killdeers, Wilson's Snipe, Meadowlarks, etc. Crowding upon these in turn come the hosts of highly insectivorous species, the last representatives of the earlier species, and those that habitually fetch up the rear of the migration. Migration may be arrested at the north and at the same time be under full headway at the south, movements taking place and territory occupied north or south as soon as it becomes tenantable, even though it be but temporarily so. So eager is the spirit to return that even the Swallows venture north before winter is hardly gone. At Saint Michaels, Alaska, according to Mr. Nelson (Rep. Nat. Hist. Coll., pp. 197, 198) the first Barn Swallows arrived during the latter half of May when the sea was covered with an unbroken surface of ice as far as the eye could reach. Frosty nights and snow-squalls were endured apparently without harm, shelter being found in old nests and other snug places until the sun shone once more.

Mr. Murdoch states (l. c., p. 116) that the spring migration at Point Barrow takes place from the middle of May to the end

of June. The first Snowflakes, however, appeared in April before the snow had really begun to melt and the King Eiders before there was any open water except the shifting 'leads' at a distance from the shore. Migration closes in Chester County about June 1, the decline being evident after the first week of May. It is significant that Mr. Scott reports boreal Sandpipers and Plovers in Florida as late as the first and second weeks of June (*Auk*, VI, pp. 156-159).

It will be observed that the repopulation of the continent occupies about the same length of time as the depopulation, nearly half the year.

Northward movement seems clearly not the starting point of migration. The first migration in all North American birds must be the southward. Evacuation is necessitated by winter, and as soon as the pressure of winter is in any measure relieved the return begins. At no time is there a beginning in the northward movement like that of the southward. The commencement of the southward and the ending of the northward movement are sharply defined, but the ending of the southward and the beginning of the northward are merged into each other—the two movements being contemporaneous for several months, the northward only achieving the supremacy after the repelling forces of winter have ceased to be potential. In brief, southward migration is esteemed to be enforced departure, and northward migration to be the earliest possible return of the birds to their home, to the region of their birth. Before pursuing this aspect of the subject further it is necessary to define the relation between cold and food-supply as affecting the later southward and earlier northward movements.

The abrupt departure of the bulk of Mockingbirds with the first cold snap in autumn (*Auk*, IX, p. 39) would seem to indicate that they find the cold uncongenial, and therefore migrate. On the other hand the fact that they are common winter residents in spite of the vicissitudes of weather seems to indicate that cold alone is not the cause of their migration. Many other species that are common or even abundant through winter are most numerous in spring and fall; the Flicker, Blue Jay, Meadowlark, and Myrtle Warbler being examples. It has been suggested that the more northern-born individuals of a

species are better fitted to pass the winter in the colder parts of their habitat than the southern-born, and are therefore the ones that linger farthest north. If mere northern birth fitted a bird for northern residence the Yellow Warbler that breeds abundantly even to the shores of the Arctic Ocean might be expected to winter further north than either its congener the Pine Warbler or the Mockingbird, and the Gray-cheeked Thrush might be expected to occur in winter in the same latitude at least as the Hermit. The circumstance that Mockingbirds from below hold their ground in the northward migration during far colder weather than that which prompted their departure in fall disposes of the idea that mere physical inability to withstand the cold is the cause of their removal. A species may be common south as well as common north of the region where the bulk winter. If temperature alone were the controlling influence the birds at the south of the centre of distribution must needs pass through and leave behind the region best suited for their winter home. If cold then is not the immediate cause of removal in the instances cited, insufficiency in the food-supply may reasonably be assumed as the cause, not necessarily insufficiency other than that occasioned by the sojourn of winter residents coming from the north. To put the matter in another way, the partial passage further south of Mockingbirds and other winter species has apparently come about through the adjustment and equalization of distribution enforced by winter, the cold simply admonishing that the period of scarcity is at hand and that departure must no longer be delayed. The migration of breeding Robins from Chester County before the close of summer appears to be an instance of adjustment in a resident species occurring long before cold.

The Mallard migrates before cold in Missouri and yet in southern Greenland it is "Common the whole year round, but most numerous in winter, when they keep in small flocks along the shore" (Hagerup, *Birds of Greenland*, p. 17). The cold closes the water courses in the Mississippi Valley and locks up the food-supply for water birds, but in the latter region there is open water at the mouths of the fjords.

I have referred to the effect of snow upon the Robin, attributing its southward movements in winter to the covering up of the

food on the ground and not to inability to withstand the cold. Likewise I would account for the fluctuations in this region in the Prairie Horned Lark—snow further north sending them south when the increase occurs simply with cold. The American Pipit endures the severest cold of this region without migrating when the ground is bare, but when it is covered with snow they entirely disappear, immediately reappearing, however, with the disappearance of the snow. At Caddo, Indian Territory, in the winter of 1883-84 no Lapland Longspurs were seen until a sudden cold turn in February covered everything with frozen rain. Then they fairly swarmed for a week; at its end, "taking advantage of a clear sky and a south wind, they disappeared, in company with all their long-clawed brethren, as suddenly as they had come" (Rep. Bird Migr. Miss. Vall., p. 185).

Rapacious species naturally follow the vegetivorous species southward, and this, together with the covering up of other sources of food, seemingly explains the inroad of Red-tailed Hawks in the winter of 1886-87 (Auk, IX, p. 30). Warmth simply opens the way for northward migration. The failure of the Palm Warblers to appear when the Pine Warblers responded to the genial weather of December, 1889 (Auk, IX, pp. 28, 29) was, perhaps, partly due to the location of the winter isolated communities and partly to the main movement passing to the westward, as the species is much less abundant in spring than in fall. Besides failure from the covering up of the sea by ice there is said to be failure of food also at the north through the descent of certain marine forms of life to the lower depths, resulting in the migration of other forms—the dearth of the land through checking of vegetable and animal life by cold thus finding a parallel in the sea.

To sum up: It seems that cold in the winter migratory movements is but the remote cause, failure of food being apparently the immediate cause. Autumn movements within the bounds of winter habitat, as in the Mockingbird, seem to be anticipatory of failure of food, the cold simply warning dilatory migrants that the season of abatement in food has really come.

Variability in the occurrence of winter residents attributed to failure of food independent of sudden cold should be considered at this point. In studying southward migration at the southern

extremity of winter range, particularly in boreal species, variability arising from southward progression is not to be mistaken for variability arising from shifting in lines of movement. The southern limit of many winter birds is not sharply defined any more than the northern limit is, there being a sort of reserved ground between the extremes of southward movement of a species.

Where there is exceptional movement it is maintained that there is exceptional cause. Such movement and cause were well illustrated when the hordes of Prairie Horned Larks were forced south into this region in the winter of 1876-77, when the snow lay on the ground for a length of time unprecedented in my experience, covering up the food-supply so that the greatest abundance occurred in the wake of the snow, as it receded northward.

As great movements of Snowy Owls and Evening Grosbeaks take place when there is no unusual cold some other immediate cause than failure of food through sudden severity must be sought for. While local abundance in the Snowy Owl may not improbably be due sometimes to variability in lines of movement of isolated communities, coming from the southern frontier of the breeding range, the wide-extended invasion of the autumn of 1876 (Rep. Bird Migr. Miss. Vall., p. 123; Deane, B. N. O. C., II, p. 9) can only be imputed to unusual migration southward. Because the effect and not the cause of the movement was witnessed, there is no necessity for assigning it to the domain of inexplicable mystery. It should be kept constantly in mind that we view the migratory movements of this Owl from the southern portions of its range and that more than two thousand miles intervene between Grinnell Land, where it is reported as breeding abundantly, and the northern boundary of the United States. As the species is a regular seasonal migrant, it is not extraordinary that there should be variations in abundance in the United States, that the migrations of the numbers should be protracted further south in some seasons than others. The incursion of Robins in January, 1887 (l. c.) with the advent of snow, lessening the food area, proves that there may be migration at the South in a bird that thrives where the mercury freezes when food is plenty. Hence, if some Snowy Owls remain in the high

north, it is not disproved that there may exist urgent necessity for migration in the bulk of the species in a region further south. If the Snowy Owl does not visit the United States regularly in great numbers, neither does the Prairie Horned Lark visit South Carolina every winter in numbers equal to those of the season of 1876-77. As abridgment of feeding grounds is promptly met in the Prairie Horned Lark by protraction of migration, it would not be remarkable if there should be protraction of migration in the Snowy Owl, owing to temporary failure of food, though the cause of the failure be different. It is well authenticated that its presence in spring and summer in portions of Arctic regions is dependent upon the lemming (Murdoch, l. c., p. 107; Nelson, l. c., p. 153). Mr. Nash, as quoted by Mr. Thompson in 'The Birds of Manitoba' (Proc. U. S. Nat. Mus., XIII, p. 545), says, "During the winter of 1882-'83 they were very common. . . . In the winter of 1883-'84 they were less numerous; in the winter 1884-'85 very few were seen; the same in 1885-'86 as in the last three [two] mentioned years; hares were extremely abundant in the north; they probably found sufficient food to maintain them there." Insufficiency in food is ascribed as the cause of the exceptional extensions of this Owl into the United States, not unusual failure on the breeding grounds, but shortness in the region generally the limit of southward migration of the numbers. The vanguard appears to penetrate so far into the land of plenty, as to open the way for an early return, the beginning of the northward migration at the southern terminus not being long deferred in the majority. A counterpart is found in the brief sojourn of the Prairie Horned Larks in this vicinity (Auk, VIII, p. 57). The term of residence in all birds at the southern points of winter distribution is doubtless determined by the extent of the food area available to the northward.

In fine, exceptional movement in the Snowy Owl is interpreted as liberal adjustment of population to food-supply—adjustment in which emigration is not put off until actual starvation is imminent (because of unusual insufficiency in food in the ordinary winter range), but emigration which takes place in advance of such impending calamity and which extends far into the region of bountiful store.

The rarity of the Snowy Owl in the United States west of the Rocky Mountains is attributed to southeasterly migration,—the

mountain system perhaps giving the trend to the movement. The wandering of solitary Owls far south is not significant, the very fact of their being alone proving that they are stragglers.

The Evening Grosbeak presents peculiar conditions. It is a northern bird of southeasterly migration, and of erratic occurrence in the more southern and eastern portions of its winter range. Its uncertain visitations seem to be due more to extension of migration southward than to variation in lines of movement. The more local irregularities, however, may be due to such variability in location of isolated communities. The Great Plains on the south and the Barren Grounds and Hudson Bay on the north seem to give naturally a southeasterly trend to its migration. If the northern boundary of the strip of territory outlined be continued eastward the New England States would fall largely to the southward of it and would be in the path of a migratory movement following its general course. The Great Lakes, too, would appear to exert a deflecting influence. As southeasterly migration exists in Brewer's Blackbird, Leconte's Sparrow, etc., it is not an extraordinary circumstance that it should exist in this species also. As in the Snowy Owl, protraction of migration is attributed to shortness in food in the usual winter quarters. Its later stay is probably due to the different character of its food, the failure being more complete, and to its shorter fly-line, a smaller subsistence area being drawn from.¹

The winter migratory movements have been attributed to covering up of the food-supply by snow and ice, and the autumn movements coincident with descent of temperature, as in the Mockingbird, have been explained as anticipatory of failure of food that would arise from over-population, owing to the presence of birds from further north. The movements of June, July, and August in this locality are obviously not occasioned by present failure of food, for migrants find subsistence long after the departure of breeding birds of the same species and often, too, in far greater numbers. These summer movements it is

¹ In the Western Evening Grosbeak, Pine Grosbeak, White-winged Crossbill, Redpoll, and Bohemian Waxwing it has not been determined, through want of precise data, to what extent irregular movements may be imputed to mere variability in location of isolated communities and to what extent to variability arising from protraction of migration.

plain remotely anticipate the failure of food of the winter season, for the birds must go sooner or later on account of winter. In order that the depopulation of the continent may not be a disastrous retreat, it must be gradual, must be an orderly evacuation. The later movements can be delayed, and winter birds can fluctuate with the advance and retreat of the ice and snow, for population has been so reduced through migration that means of subsistence are still to be found. Such would evidently not be the case if movement was deferred until famine was imminent. The vast population of the continent would be so crowded in the advance that food would fail. There could be no relief through scattering of forces, as in the Passenger Pigeon in the daily excursions after food in the region contiguous to a 'nesting.' In short, it is maintained that the only way that the depopulation could take place in an orderly manner is by gradual migration, beginning early in the season.

The question why some birds protract their migration southward and others do not should here be considered. Apparently other than climatic reasons must be sought. The American Golden Plover, Snowflake, Orange-crowned Warbler, Black-poll Warbler, Grinnell's Water-Thrush breed in Arctic regions. The Snowflake hardly reaches beyond the northern parts of the United States, but the American Golden Plover penetrates to Patagonia. The Orange-crowned Warbler winters as far north as the South Atlantic and Gulf States and Grinnell's Water-Thrush as the southern border of the United States, while the Black-poll Warbler is said to pass the winter entirely south of our limits. Difference in constitution¹ might explain why Snowy Owls remain within the Arctic Circle through winter and why the Yellow Warblers that breed there seek milder climes, but it does not explain why the Bobolink crosses the equator while the Phœbe endures the ice and snow in Upper South Carolina, nor why the Hermit Thrush winters

¹ The relative hardness of different species is not easy of determination. If proneness to migration be taken as a criterion, the Robin, as a summer migrant from Chester County, would rank as a feeble bird than the Blue Grosbeak, and, in the vernal movements, the Black-poll Warbler, among the latest of transients in this region, than the Black-and-White Warbler, Blue-gray Gnatcatcher, and Yellow-throated Warbler, which are the first migrants to arrive in this locality that do not belong to winter species.

abundantly in the South Atlantic States and the Gray-cheeked Thrush passes on to Middle America,¹ nor why the Northern Phalarope is restricted to the Northern Hemisphere while Wilson's Phalarope continues its flight to Patagonia. The explanation I would advance is, that the present displacement and equalization of distribution through diversity in southward migration has been evolved through the process of time and is perpetuated by the requirements of winter. It is well known that birds can thrive far north of their usual winter habitat,² proving that extended protraction of migration is not a necessity except as there is need for general distribution, for there must be dispersion, and dispersion sufficiently wide-extended as to avoid the possibility of famine. All birds cannot exist in the same latitude *from sheer numbers*, no matter how abundant food may be.

There are extraordinary occasions where the adjustment does not prevent accident. During December, 1876, and January, 1877, the ground was covered with snow in this locality for over a fortnight, for a length of time greater than any in my experience. Old men recurred to many years before for a like event. Toward the end, and after the temperature had risen, there was great suffering among birds that find their living chiefly upon the

¹ While the Phoebe may possibly have a more plastic organism than other Flycatchers of Eastern North America and therefore be better able to accommodate its diet to the food of the winter season, the Hermit Thrush does not appear to possess any such advantage over the Gray-cheeked Thrush. While passing through Chester County in fall, Gray-cheeked Thrushes feed, so far as I have determined, exclusively upon dogwood berries. Such food evidently agrees with them for they are often so fat as to be unfit for specimens. Dogwood berries are also a favorite diet with the Hermit and Olive-backed Thrush.

² The following instances illustrating the occurrence of individual birds in the colder months north of their customary limits are selected from this journal: Chimney Swift, Ottawa, Canada, first week in February, 1883 (W. L. Scott, Auk, I, p. 161). Yellow-bellied Flycatcher, Reading, Mass., Nov. 29, 1876; "the day was so cold that ice was forming rapidly in the shade"; stomach empty; "was very fat and apparently in the best of spirits": Newton, Mass., Dec. 1, 1876 (Allen, B. N. O. C., III, pp. 101, 102). Baltimore Oriole, East Templeton, Mass., Nov. 15, 1885; "in perfect plumage and condition"; "feeding upon frozen apples" (Ingalls, Auk, III, p. 135): Portland, Conn., Nov. 15, 1885 (Sage, *ibid.*). Louisiana Tanager, New Haven, Conn., Dec. 15, 1892; Lynn, Mass., Jan. 20, 1878 (Flint, Auk, X, p. 86). Maryland Yellow-throat, Cambridge, Mass., Jan. 31, 1890; "in beautiful plumage, and plump, although the mercury within a week had fallen to 5° F" (Faxon, Auk, VII, p. 409).

ground. Vesper Sparrows and others became so famished that children and dogs ran them down and captured them. That their weakness was not due to cold, but to exhaustion from want of food is shown by their enduring in other years, when there was no snow, even greater cold without apparent discomfort. Whether the birds that remained during the stress of weather were migrants from the north that could get no further, or whether they were winter residents whose previous experience, be it personal, traditional, or inherited, had shown that snow was of short duration in this region, is a matter undetermined. The American Pipits, however, were prompt to go, as is their custom, and there was partial migration early in other ground-inhabiting species. Mr. Mackay mentions an instance (*Auk*, IX, pp. 334, 335) where Old-squaws on the Massachusetts coast perished from lack of food owing to the prevalence of ice.

While northward migration is held to be but a return-movement, effected at the earliest moment, the conditions that prevent migratory birds from remaining in the regions visited during their migrations are not overlooked. Over-population and resultant struggle for existence alone would preclude them from becoming stationary in these regions.¹ This necessity for dispersion also forces them to return to the region of their birth. That birds should return to the same region to breed and winter is as necessary as migration itself, for if there was no definite destination in the majority of species there could be no uniformity of dispersal.

As is well known, climatic conditions are potential influences in distribution in the breeding season, the presence of boreal-breeding birds far south on high mountains is a striking example. Perhaps such conditions are equally potent in the migration of some species, other regions than those where they breed being unsuited to their needs.² Possibly concomitant alimentary con-

¹ In the South Temperate Zone, winter and migration from the south in indigenous species would not only enforce the return of North American birds to their breeding habitats, but would also prevent any void occurring through their departure. It is not to be forgotten that there is some displacement at least of breeding birds by winter birds in the tropics (*antea*, p. 10).

² Circumstances like the breeding of a pair of Myrtle Warblers in eastern Maryland (*Kumlien*, B. N. O. C., V, p. 182), the overlapping of the breeding ranges of northern and southern birds in mountains, and the wide-ranging in the breeding season of species like the Yellow Warbler, create a doubt whether conditions arising from

ditions are involved, particularly as pertaining to the food of the young. It is hardly to be supposed that there is any vital failure of food in the winter habitat (at least north of the tropics), for some species that are common in winter attain their greatest abundance, as migrants or breeders, after the departure of the winter sojourners of the same species.

In brief, the conclusion is reached that all southward migration in North America is depopulation because of winter, and all northward migration¹ is repopulation because of summer, the two great migratory movements being the adjustment of bird-life to the food-supply as ordered by the changing seasons—the food area decreasing with the progress of the sun southward, forcing birds to leave the region of their birth, and increasing with the progress of the sun northward, enabling them to return to it—to the region where the established equipoise between food-supply and distribution may be maintained and where the conditions arising from climate are perhaps better suited to the requirements of the breeding season.

Psychological Cause.—Having considered the physical causes of migration—those outer conditions on which migration depends—we come now in the second place to examine the psychological causes—those inner facts of bird life which have adjusted the migratory movements to the physical requirements.

climate are insurmountable obstacles to successful reproduction in latitudes and altitudes higher or lower than the normal breeding range. Extension of range, however, might not be possible in such instances as the Myrtle Warbler, for the natives of the soil might be better fitted to survive than the interlopers in the contest that must inevitably ensue. In mountain regions the peculiar conditions may have rendered such contest more equal, resulting, in lapse of time, in the present overlapping. The absence of some boreal species on high mountains may be due to their inability to cope with other species except under the conditions prevailing in the region of their birth. Lack of powerful opposition may perhaps also account for the ranging of some birds, independent of altitude, farther north or south in certain regions than in others. As to the representatives that breed in high latitudes of species of wide-breeding-range, they may have become so modified as to find the environment in the southern portions of the breeding habitat uncongenial, but above and behind any such possible cause is the necessity for dispersion.

¹ While southward migration and northward migration are more appropriate terms than spring migration and fall migration, they do not cover altitudinal migration and migration in an east or west direction, though both are component parts of the two seasonal movements. Depopulating-migration and repopulating-migration seem more expressive designations.

In winter, as has been seen, there are physical conditions that force birds southward, which birds are prompt to recognize, and in autumn physical conditions that serve at least to admonish that it is time for the journey south to begin. In the summer movements, however, such incentives are wholly wanting. The pressure of migrants from further north, however potential it may be in some stages, is lacking in the first movements. How, then, does this adaptation, to the necessity for early migration come about? Is the cause a mere blind impulse, inherited from ancestors? or is it the result of education, indirect from example, or direct through special instruction? Birds perform long journeys, following the outlines of landscape, occupying the same regions season after season with such regularity that life areas are defined with certainty. They adjust their winter movements to the ice and snow, and meet exceptional conditions by exceptional migration. These facts, indicating as they do that birds possess a high degree of intelligence, are incompatible with the theory that mere blind impulse is the cause of migration.

The conduct of wild birds in confinement, procured when young, was long ago pointed out by Dr. Bachman in his essay on migration (*Amer. Journ. Sci. and Arts*, XXX, 1836, p. 96) as evidence of inborn impulse. The spirit of restlessness spoken of may have been aroused, however, by the presence of other birds that were migrating at the time. Further, wild birds in captivity do not always exhibit such restlessness, as is attested by Mr. Watkins in the *Evening Grosbeak* (*fide* Butler, *Auk*, X, p. 157). Audubon says (*Orn. Biog.* III, p. 9) of a female Canada Goose raised from an egg taken from a wild bird, "At the period of migration she shewed by her movements less desire to fly off than any other I have known; but her mate, who had once been free, did not participate in this apathy." This species has become a 'classic' illustration of the alleged awakening of an irresistible desire for migration with the return of spring. It is now well established that there is continual migration in this and other species during the colder months, there being no sudden arousing of migratory impulse in their case at least. In mild autumns the later migrants delay their journey, lagging by the way, evincing that the impelling force in the continuance of their migration is from without and not from within. Still these facts

do not disprove that heredity may be an important factor in migration. The disposition for migration may be dormant or inoperative until awakened into action by the example or possibly by the instruction of older birds. The formation of woodland groups after the breeding season and their roaming through the woods is the first step toward migration in the young of many species. The gathering of the colonies of Red-winged Blackbirds in this locality into compact flocks and their desertion of the breeding marshes preliminary to their leaving is further illustration of the training that precedes migration, as also are the collection of Swallows and the establishment of 'summer Robin roosts,' such as described by Mr. Brewster (*Auk*, VII, p. 360). The departure of old birds does not leave the young without guidance, for the migration is a gradual depopulation. There are the belated breeders of the same species, the tardy breeders, the birds from localities further north, and those in which the young largely accompany the old, to serve as guides.¹ While the movements are scarcely perceptible when the old in woodland birds begin to disappear, when the young depart the current of migration is setting steadily southward. To the trained student of bird migration, the gatherings, their movements, and the notes of the migrants have a distinct meaning. How much more must the meaning be to the native birds of a locality. When migrants are arriving and departing, and when the air and woods and fields are filled with their voices, is it strange that the young should catch the spirit and join the movement southward? Having learned the way, is it remarkable that in subsequent seasons, as old birds, that they should become leaders and give inception to the migration? Want of experience, as well as probable lack of wing power, may have something to do with the tardiness of the young in the first season. While the spirit of migration may be hereditary, it is certain that southward migration is inaugurated and perpetuated solely by the experienced travellers. Whether the subsequent education of the young extends to an intelligent appreciation of the necessity for migration in the early southward movements, as is apparently the case in the winter and in the

¹ Guidance by veteran leaders in the northward migration is affirmed by Mr. Harvie-Brown in the case of 'Wild Geese' in the Outer Hebrides (*Auk*, VI, p. 271) and by Mr. Mackay in the Surf Scoter in New England (*Auk*, VIII, p. 283).

exceptional movements, can only be surmised. It is not too much to say that there is a common stock of knowledge, gained in the past and transmitted from generation to generation, that all adult birds possess.¹

The stubbornness with which Warblers, etc., venture north in spite of freezing weather is not to be attributed, I think, to lack of intelligence, for it is not the cold of autumn followed by the dearth of winter that they encounter, but the brief cold spells of spring preceding the warmth of approaching summer with its abundance of food. Mere cold does not seem to have the effect that cold storms of wind and rain have, for hosts of Warblers endure freezing weather at the north late in May with apparent impunity (see Grundtvig, *B. N. O. C.*, VIII, p. 67). The movements cannot be delayed until all obstacle is removed, because of numbers and lack of time. Then, too, there must be a definite time of starting, which, as has been seen, is as soon as territory is available for occupancy. The necessity of occupying all available territory is evident, so it happens that fall movements are delayed in mild seasons and advanced ground in winter, temporarily habitable, is taken possession of.

Physiological restlessness on the approach of the breeding season has been advanced as a cause of northward migration, but it apparently leaves unexplained the early winter movements. Further no such reason can be assigned for summer migration southward (though an opposite one might be), yet its inception occurs with the utmost regularity. Still it is not denied that the nuptial passion may exist when the knife does not reveal it, for it is not dormant even in south-bound transients in September and October. Neither is it altogether denied that desire for procreation may in a manner be a prompting influence in northward migration. It can hardly, however, be a paramount cause, independent of other causes, for it exists in sedentary species as well. 'Home affection' has also been put forward as the cause

¹ The following instance of young Passenger Pigeons succumbing to an emergency which old birds overcame is reported by Mr. Brewster on the authority of a Michigan Pigeon netter. "On one occasion an immense flock of young birds became bewildered in a fog while crossing Crooked Lake and descending struck the water and perished by thousands. The shore for miles was covered a foot or more deep with them. The old birds rose above the fog, and none were killed" (*Auk*, VI, p. 289).

of northward movement. If this were the real cause birds of unstable local distribution, like the Dickcissel, would be without incentive, still they are regular migrants. *A cause must cover the whole ground to be the fundamental cause.* It is not unlikely that love of home is an important factor governing local distribution in many species, but causes that merely influence the selection of place of local abode are not to be confounded with the causes that occasion migration. As has been stated under 'Physical Cause,' northward migration is viewed simply as a return movement that is restrained only by the snow and ice. There are outward conditions that necessitate it. On the part of the birds, as in early southward migration, there is intelligent adaptation to these conditions—how far-reaching it is, and to what extent heredity enters as a factor, the limits of our present knowledge leave undetermined.

Finally, to sum up in brief the conclusions reached in the preceding remarks:—

(1) That migration begins with the southward movement, commencing south and north before August and progressing gradually, the two movements each extending over a period of nearly six months.

(2) That the young do not precede their parents in the southward movement.

(3) That all southward movement of birds is enforced departure from the region of their birth (enforced evacuation of territory capable in winter of supporting but a small portion of its summer life), and that all northward movement is return from exile at the earliest opportunity, necessitated by pressure from the south (by the need of dispersal and occupancy of all available food areas), and perhaps, in some species at least, by requirements as to climate during the breeding season.

(4) That the earlier southward movements are anticipatory, and necessarily so, and the later directly resultant of the conditions of winter.

(5) That irregular occurrence in winter birds is ascribed,

(a) To variableness in the location of isolated communities, independent of failure of food or severity or mildness of season.

(b) To sudden cold contracting the food area and forcing birds southward (cold being the remote cause and failure of food the

immediate cause), and to unusual protracted warmth enlarging the food area and encouraging birds northward.

(c) To failure of food independent of sudden severe cold.

(6) That extended protraction of migration southward and the partial passage further south of regular winter and resident species, that are uninfluenced by sudden ice and snow, are due to adjustment in distribution that prevents over-crowding, and not to climatic reasons.

(7) That fixity in destination in the majority of birds is as essential as migration itself, for without it there could be no uniformity of dispersion.

(8) That time, experience, and a high order of intelligence have brought about the adjustment necessitated by the physical conditions.

I have thus presented the facts observed during a long field experience and the conclusions and inferences that have suggested themselves in my endeavor to interpret them.

NOTES ON THE BIRDS OF PORT HENDERSON, JAMAICA, WEST INDIES.

BY GEORGE W. FIELD.¹

THE beautiful island of Jamaica, though but a little larger in area than the State of Massachusetts, presents many diverse conditions affecting the local distribution of its bird-life. On account of the regularity with which these conditions are maintained, there is a remarkable uniformity in the species and numbers of birds found at any given locality. Chiefly on

¹ [An annotated list of the Birds of Jamaica, by Mr. W. E. D. Scott, was recently published in 'The Auk,' in instalments beginning with the number for October, 1891, and closing with the number for October, 1893. It is but just to Mr. Clark to state that the article here printed was received for publication in March, 1892, and has been unavoidably delayed. As Mr. Scott's observations were made in December, January, February, and March, and Mr. Clark's in May, June, July, and August, the two lists admirably supplement each other.—EDD.]

account of the uniform climatic conditions, and consequently of the unlimited food supply, there are very few extended migrations; and there are many species of birds abundant in one locality which are of exceedingly rare occurrence a few miles away.

During the summer of 1891 it was my good fortune, as a member of the Johns Hopkins Marine Laboratory, to spend about four months in Jamaica, nearly three of which were passed at Port Henderson, near the entrance to Kingston Harbor.

Port Henderson is situated on the coast at the foot of the Salt Pond Hills, a low range commanding the entrance to Kingston Harbor. To the north and northeast extends the Liguanean plain, almost the only extensive level tract of land in the island. About a mile or two distant is the Rio Cobre, along whose banks are extensive marshes and mangrove swamps. Between Port Henderson and this river is a large lagoon or salina, a portion covered with mangroves, and its shallow water swarming with small fish; a favorite resort for Herons, Rails and kindred spirits. Back of this on the fertile farms the land birds are found in abundance. Port Henderson proper is so situated that it is the driest point in Jamaica—so dry that the tropical luxuriance of vegetation to be found a mile or two inland is represented only by a wonderful growth of cacti of many species.

The time at which we were located here (May 26 to Aug. 23) was particularly fitted for observations upon the resident birds. I have not attempted to give a complete list of the birds which may be found here, but refer only to such as came under my observation. It will be noticed that very few migrants had arrived up to the time of my leaving Port Henderson, August 23. After the scientific name I have added the common name of the birds as employed in the negro dialect.

My thanks are due to His Excellency Governor Blake for a license to take birds; to R. Hoepkin and Company, who continually manifested great interest in our work and furnished us with very material aid; and to Mr. Lindell of Congress Park, a man of more than local reputation as a lover of the gun, and the best versed in bird lore of any one in that section, who furnished me much reliable and valuable information; and particularly to Charles B. Taylor, Esq., to whom I am much indebted.

Through his kind attention I was introduced in proper form to the birds of Jamaica. Mr. Taylor is undoubtedly the best informed man in Jamaica upon the native birds, and he is glad to place his fund of information at the disposal of the visiting ornithologist.

As is well-known, the fauna of Jamaica has been greatly modified during the past few years through the introduction of the Mongoose, and in this part of the island the animal is found in great numbers. Through its agency, the snakes, notably the yellow boa, until within a few years very common, and also the larger lizards, particularly the iguana, have been almost if not quite exterminated; but the ground nesting birds have been the greatest sufferers; the Quail, the wild Guinea Fowl, and the Limpkin are now very scarce. In this connection it is particularly interesting to note that the Ground Dove has here very quickly changed its nesting habits, and now builds at some distance from the ground upon broken cacti, or on large or broken limbs of low trees, in any spot where a surface large enough for laying the nest is to be found. Attention is also called to the occurrence of *Sterna anæthetus* in Jamaica; of the occurrence of *Spiza americana* in the West Indies; to the peculiar nesting habits of *Cæreba flaveola*, upon which point we may hope to have some interesting notes from Mr. Taylor, and also to the occurrence at Port Henderson of *Mimus hillii*.

It may be of interest, too, to add that on the visit which we made to the summit of Blue Mountain Peak we were unable to find any evidence or information that the Jamaican Petrel or 'Blue Mountain Duck' (*Æstrelata jamaicensis*) resorts regularly to this locality, though such is said to be the case.

1. *Colymbus dominicensis* Linn. DIVING DAPPER.—Common. Breeds in the bogs along Ferry River. It fights fiercely when captured and the negroes are fond of telling tales of the execution which it can do with its sharp beak.

2. *Podilymbus podiceps* (Linn.). DIVING DAPPER.—Not so common as *C. dominicensis*.

3. *Sterna anæthetus* Scop.—At the entrance to Kingston Harbor are several cays varying in size from a mere sand bank to islands of an acre or more in area. The larger of these are dignified by names. Between South Cay and Drunkenman Cay there is a small island composed entirely of broken coral rock; in reality it is merely a part of the barrier

reef above water. Close by and to the southeast of this is a larger, sandy cay, with a few broken slabs of loose coral rock, the western end of which is covered with mangroves. Upon the former of these islands we found, June 15, about a dozen pairs of Bridled Terns, evidently breeding, but from the nature of the place we were able to find but a single young bird in the down, for the slabs piled in confusion furnished a labyrinth into which they beat a hasty retreat and from which they were not easily dislodged. Leaving the island we landed on the wooded island last mentioned and here we found three or more pairs breeding. Under a flat rock, supported at one end by another rock, we found the single egg laid as usual on the bare sand; the bird darting out at our approach betrayed the place.

On July 24 we found the rocky island occupied by large numbers of Noddies, a few Bridled Terns, with six or eight Roseate Terns, and what I took to be *S. hirundo* (these birds were shot and are in Mr. Taylor's collection). None of these were breeding.

I found many Bridled Terns on Pelican Cay and on Pigeon Island, two of the cays near Old Harbor. From the latter place, on August 4, I took one egg and one young bird in the down. The locality chosen for the nests was similar to that previously noted. The nests, however, were more readily found on account of the habit which the bird has of roosting close by the nest.

4. *Sterna maxima* *Bodd.*—Common. Did not find the breeding place.

5. *Sterna sandvicensis aculavida* (*Cabot*).—Common.

6. *Sterna fuliginosa* *Gmel.*—Very common. Breed in vast numbers on Morant, Pedro and many smaller cays, in company with the following.

7. *Anous stolidus* (*Linn.*).—Very common. These, as well as *S. fuliginosa*, are readily killed with sticks and stones, so fearless are they on their breeding grounds.

Soon after arriving in Kingston my attention was attracted by the great quantities of Terns' eggs exposed for sale. Inquiry elicited the information that they were "booby h'eggs, Sir." At that time (May 13) the season is at its height, and schooner loads are brought to Kingston from Morant Cays, thirty miles off the eastern end of the island, and from Pedro Cays, lying to the southward. The eggs sell in the market for about "a bit" (9 cents) per dozen. The great majority of the eggs are those of *Sterna fuliginosa*, but occasionally one can pick out with tolerable certainty the Noddy's eggs (*Anous stolidus*). The right to take eggs from these cays is sold at public auction in Kingston. The natives group all the Terns and smaller Gulls under the term 'Boobies.'

The Noddy and Sooty Terns in small numbers are found in Kingston Harbor after the close of the breeding season.

8. *Larus atricilla* *Linn.*—Common. Usually a few individuals were seen in the flocks of Terns. A single pair was found breeding on Lime Cay, June 5.

9. *Fregata aquila* (*Linn.*). MAN-O'-WAR BIRD.—Common, and very tame. On several occasions I saw them fishing for themselves: no

diving like *P. fuscus* but swooping down into the school of small fish. They are particularly fond of dead fish and they can be caught on a line with a hook baited with a small fish. At Port Henderson they had a habit of flying in to roost on a small island back of Fort Augusta, late in the afternoon again flying out to sea, to roost on the outer cays. Usually the stiff southeast breeze drifted many of them over towards the wharf, and by taking a station there several could be shot on a favorable afternoon.

Early morning visits to Drunkenman Cay found the mangroves literally loaded down with them. But I found no traces of nesting.

I can only counsel the visitor not to be beguiled to visit Deadman Cay, Old Harbor, by reports that the Man-o'-War Bird is nesting there. We visited them with a very reliable man who had taken eggs there repeatedly, "a plenty, Sir, a plenty of them."

10. *Guara alba* (Linn.).—Mr. Jennings of Old Harbor tells me that there is a rookery of *Guara alba* in a mangrove swamp between Goat Island and Wreck Bay, "not too far" from the shore.

11. *Guara rubra* (Linn.).—Reported by the fisherman as not uncommon in the swamps after heavy weather from the southward. They sell in Kingston for 2 s. per pair. During my four months' residence at Port Henderson I did not see an Ibis of either species.

12. *Ardea herodias* Linn. CRANE.—Not uncommon. Most often seen on the shores of Hunt Bay.

13. *Ardea egretta* Gmel. WHITE GANLIN.—Common. Nest on an island in that portion of the mangrove swamp called 'the flashes.' Eggs taken June 25.

14. *Ardea candidissima* Gmel. WHITE GANLIN.—Common. Breeds as above.

15. *Ardea cærulea* Linn. BLUE GANLIN.—Very common; with *A. tricolor ruficollis* it constitutes the great majority of the Herons. Breeds as above. Eggs taken June 3 to July 8.

16. *Ardea virescens* Linn. CRAB-CATCHER.—Common, though by no means so numerous as the foregoing. Breeds on the mangroves.

17. *Ardea tricolor ruficollis* (Gosse). BLUE GANLIN.—Excels all the other Herons in numbers. Breeds in 'the flashes.' Breeding season, June and July. July 8, young in nest nearly fledged. Young of the year shot July 15.

18. *Nycticorax violaceus* (Linn.). QUOK.—Common. Breeds in company with the other Herons. Eggs taken June 12.

19. *Nycticorax nycticorax nævius* (Bodd.). QUOK.—Not common.

20. *Ardetta exilis* (Gmel.). CRAB-CATCHER; TORTOISE-SHELL BIRD.—Not common. May be found running over the mangrove roots; I have never seen the Least Bittern wading in the water pursuing the fish after the manner of the other Herons, but it clings to the roots projecting from the water and from these darts his bill at the small fish and crabs. Nest in the mangrove swamp. Eggs taken May 29.

The Herons, in the order of their relative abundance, would stand as follows: *A. tricolor*, *A. cærulea*, *A. egretta*, *A. candidissima*, *Nycticorax*

violaceus, *Ardea herodias*, *A. virescens*, *Ardetta exilis*, *N. nycticorax naevius*.

21. *Aramus giganteus* (Bonap.). CLUCKING-HEN.—No longer common about Port Henderson. Within a very few years it was found abundantly in the dark woods and logwood swamps, between the Rio Cobre and Ferry River. The mongoose is said to be responsible for its rapid disappearance. It was much esteemed as food by the natives.

22. *Rallus longirostris caribæus* (Ridgw.). MANGRO'-HEN.—Very common in the mangrove swamp. Their strident voices may be heard in every direction in the early morning. Exceedingly wary and difficult to see. Its nests are readily found; usually near the edge of the swamp, in the center of a small isolated clump of bushes. The nest, about a foot in diameter, is a collection of short, small, dead mangrove twigs resting in the center of the bush and is built up about six to twelve inches above the water. The nesting season is at its height in June. The eggs are collected by the negroes and are esteemed a delicacy equal to 'Booby h'eggs.' The breeding season is rather prolonged, a few eggs being still to be found Aug. 15.

23. *Gallinula galeata* (Licht.). RED-HEAD COOT.—June 6, I shot young birds nearly full grown. A female shot on the same day had eggs nearly ready for depositing. An exploration of 'the bog' (the Caymanas bog on Ferry River) disclosed only empty nests.

These birds breed in suitable places along Ferry River. I had planned to make another trip to the above mentioned bog about June 18, but about June 10 the long delayed 'May rains' set in and the entire region was soon under water. A combination of circumstances prevented me from making the second visit.

In this locality *Ionornis martinica*, 'Plantain Coot,' as well as *Porzana jamaicensis*, are said to breed.

24. *Fulica americana* Gmel. WHITE-HEAD COOT; BALD-HEAD COOT.—A common resident in Jamaica, but much more abundant as a winter resident.

25. *Himantopus mexicanus* (Müll.). RED-LEGS.—Common, in flocks. No evidence of their nesting at this time at this locality.

26. *Macrorhamphus griseus* (Gmel.). GUINEA-HEN PLOVER.—Appeared in small flocks August 2.

27. *Tringa minutilla* Vieill.—May 29, numerous small flocks seen. June 10, saw a flock made up of *T. minutilla* and *C. arenaria*, bound north. Aug. 2, large flocks of Least Sandpipers, returning from the north. From these dates it will be noticed that the interval between the departure of the last stragglers, and the return of the advanced guard from the north is remarkably brief.

28. *Calidris arenaria* (Linn.).—Flocks of Sanderlings seen in company with Least Sandpipers, June 10.

29. *Totanus melanoleucus* (Gmel.).—June 1, a few stragglers on the northern migration.

30. *Totanus flavipes* (Gmel.). GUINEA-HEN PLOVER.—Small flocks appeared August 2.

31. *Actitis macularia* (Linn.).—Resident, but not common.

32. *Charadrius squatarola* (Linn.). GRAY PLOVER.—A single bird seen June 1.

33. *Ægialitis wilsonia* (Ord).—Common. Breeds on the sandy cays and salinas (low saline plains along the coast).

34. *Arenaria interpres* (Linn.).—June 12 shot two in immature plumage.

35. *Colinus virginianus* (Linn.). QUAIL.—One of the many birds which are being rapidly exterminated by the mongoose. Formerly abundant, it has become very scarce in the last two or three years. A few flocks may still be found in St. Andrew's Parish.

36. *Columba leucocephala* (Linn.). BALD-PATE.—Very common. A prime favorite with sportsmen and natives. Breeds in the mangrove swamps. On June 6 I found many nests with young, while several contained newly laid eggs. The young are taken in numbers from the nests by the negroes and reared in confinement. Nearly every hut appeared to have several pairs of squabs, which were being raised on rice and fruit of the cactus, — a style of dry nursing upon which they seemed to thrive very well.

Aug. 4, at Pelican Cay, we found them nesting in considerable numbers. The close season was off July 25, and on the island we found four or five men hidden in the bushes shooting the Pigeons as they came to feed the young in the nests. A great number are thus killed, and at the close of the day the accessible nests are rifled of the young birds. At Pigeon Island we were told that the Pigeons bred in myriads; but we found no trace of an unusual number. Whatever the place may have been in the past, there remained nothing remarkable as a Pigeon rookery. There were many nests on the southern side of the island; of those examined four contained eggs, while there were many with young birds.

From these and other observations it would seem desirable for the preservation of one of the finest game birds of Jamaica that the close season should be extended to August 10 or 15 at least.

37. *Engyptila jamaicensis* (Linn.). WHITE-BELLY.—Common. During the breeding season at least it spends much time in the cover of the bushes, traveling over the ground at a very rapid walk in search of food. Its range seems to be more especially confined to the hills.

38. *Zenaida zenaida* (Bonap.). PEA DOVE.—Very common. Most abundant about the cultivated sections. Found nesting in June.

39. *Melopelia leucoptera* (Linn.). WHITE-WING.—Very common; probably the most abundant of the Columbidae. Breeds in considerable numbers in the mangrove swamps; the nests are also to be found, though less frequently, on the wooded hills. Was found nesting in June and early July.

40. *Columbigallina passerina* (Linn.). GROUND DOVE.—Very common at Port Henderson and vicinity, — much more so than at any other point

which I visited on the island. The nests are placed on the broken tops of the cactus, or in convenient places a short distance from the ground, — a habit probably acquired since the introduction of the mongoose, and a habit which alone can have saved this beautiful little Dove from extermination.

41. *Cathartes aura* (Linn.). JOHN CROW.—Very common. The sanitary mainstay of the inhabited sections. A native would almost prefer to kill a man rather than a John Crow. A more suitable name would be King Crow, for he reigns supreme.

I watched carefully, but without success, for *C. atrata*, being very confident that from long familiarity I could recognize his mode of flight.

42. *Strix flammea furcata* (Temm.). SCREECH OWL; WHITE OWL.—Common, particularly about the old church belfries and in caves.

43. *Crotophaga ani* (Linn.). BLACKBIRD.—Common a short distance from the sea shore. Nesting season, July. Nests rather bulky and placed in the tops of trees. One nest was found containing 20 eggs, apparently laid by several females. The usual number secured were 4 or 5 in a nest.

44. *Saurothera vetula* (Linn.). OLD-MAN-BIRD.—Not common. Generally found among the low cashaw bushes and in the thickets. More numerous farther inland.

45. *Coccyzus americanus* (Linn.). MAY-BIRD.—Common. May 29 I found a nest with 7 eggs in the mangrove swamp. The nesting season continues until the middle of July. With the exception of *C. ani* it is the most abundant Cuckoo in this locality. Nests most commonly in the cashaw trees.

46. *Coccyzus minor* (Gmel.). MAY-BIRD.—Common, though far outnumbered by *C. americana*.

47. *Todus viridis* (Linn.). ROBIN-RED-BREAST.—Common. This usually inconspicuous little bird attracts considerable attention when indulging in his outburst of successive plaintive calls, sitting in full view on a dead limb, as if with intention to attract the eye to his delicate green plumage set off by the bright red throat. He is found in greater numbers further inland where the vegetation is more luxuriant and where the cultivated ground ensures an abundance of exposed banks in which it burrows. The burrows usually run straight into the bank for a few inches, then turn at right angles and extend for several feet parallel with the face of the bank. At the end the highly polished white eggs are deposited, usually in April and May.

48. *Centurus radiolatus* (Wagl.).—Common. One cannot go through the fields of Guinea grass, in which stand the huge cashaw trees, without being reminded of the apple orchards of the northern United States. He could not fail, too, to be arrested by the cry of this common Woodpecker, so loud in proportion to the size of the bird.

On an early morning walk I was attracted by an amusing incident. A Woodpecker was making the chips fly vigorously digging out a larva from a dead branch. About six feet away sat a 'Loggerhead' (*Pitangus caudifasciatus*). When the Woodpecker finally reached the succulent grub,

and was holding it in his beak, with the enjoyment of anticipation, preparatory to swallowing, the Loggerhead with a scream dashed at the Woodpecker causing him to drop the food. The Woodpecker, however, merely bent his head over and looked regretfully after the falling food, but made no attempt to recover it; the robber quickly dashed down and devoured the morsel. The Woodpecker accepted his ill luck as a matter of course, and philosophically wasted no time over a spilled grub, but went busily to work again. The Loggerhead stationed himself once more near the apparently unconscious worker, and at the proper time attempted to repeat the robbery; but the Woodpecker was on his guard and succeeded in swallowing the insect. This was repeated several times, *Pitangus* evidently finding it more profitable to act as highwayman than to hunt for himself.

49. *Nyctibius jamaicensis* (*Gmel.*). PATOO; OWL.—Common. Much esteemed as food by the negroes. This enormous Goatsucker may be seen at dusk, perched upon a dead limb, or for many nights in succession he may perch upon the ridge pole of the house. It appears to have favorite resting places. It sits parallel with the limb.

I could get no information as to the nesting habits of this bird; found no one who had ever seen its egg. On the roof of the belfry of the church at Old Harbor I was told there was an "Owl's nest." Examination showed only a few leaves and straws and a quill feather of this bird. There is a possibility that here may have been the nest.

50. *Chordeiles minor* (*Cab.*). GIE-ME-A-BIT.—Common. Deposits its egg (less commonly 2 eggs) on the sand flats and dried bed of the salina. It is named by the negroes, and I am sure they regard it as a most fitting name, but they would be more pleased if the sound could be twisted into 'Gie-me-a-quattie.' Popular superstition has it that any one who picks up the egg from the ground is certain to drop dead. The belief has great weight with the majority, but occasionally one finds a doubter who says he has "picked up the h'egg myself, Sir."

51. *Cypselus phœnicobius* (*Gosse*). RAIN-BIRD.—Very common a short distance inland. Nests in the tops of the cocoanut trees.

52. *Hemiprocne zonaris* (*Shaw*). RAIN-BIRD.—Not common. Aug. 7 saw a large flock flying with great chattering which could be heard some distance.

53. *Lampornis mango* (*Linn.*). DOCTOR-BIRD.—Common. The most common Hummer in this dry section. Resort to the 'dildoes' for food. I have repeatedly seen them catch small insects which were flying about the cactus fruit. They also puncture the ripe cactus fruit and drink the juice.

May 29, they appeared to be breeding in the numerous islands of cactus and cashaw, in the salina. Nests are said to be most commonly placed on dead limbs and at considerable distance from the ground.

54. *Aithurus polytmus* (*Linn.*). DOCTOR-BIRD.—Common a little further inland, where the vegetation is more luxuriant. Young of the year shot July 20.

55. *Mellisuga minima* (Linn.). BEE HUMMINGBIRD.—Very common. The Hummingbirds resort in great numbers to the blooming tamarind trees. The Bee Hummers outnumber *A. polytmus* fifty to one, while *L. mango* is rarely seen; he evidently feeding on grosser food.

July 17 I found a nest of *M. minima* in the growth of cashaw, *lignum vitæ*, and dildoes north of the salina. It is a dainty affair, built of the down of *Tillandsia*, very deeply cupped, and perched upon the upper side of a drooping twig about one-eighth of an inch in diameter, about four feet from the ground. It contained two fresh eggs. Had it not been placed in such a sheltered location, its cobweb moorings must have quickly parted before the daily sea breeze.

56. *Elainea cotta* (Gosse).—Rare at Port Henderson. A single specimen was shot by Mr. Taylor.

57. *Myiarchus stolidus* (Gosse). TOM-FOOL.—Common, nesting in holes in trees or about the houses. A favorite site is in the top of the bamboo palisades which surround so many of the negro houses. Breeding season, June.

58. *Tyrannus dominicensis* (Gmel.). PETCHARY.—Not common at Port Henderson, but found in considerable numbers a short distance inland. Breeds in June.

59. *Pitangus caudifasciatus* (D'Orb.).—Very common. Breeds in May and June.

60. *Icterus leucopteryx* (Wagl.). BANANA-BIRD.—Common. Nest closely resembles that of the Orchard Oriole, but is larger with thinner walls. Nesting season, June. Young birds in company with the parents seen July 20.

61. *Quiscalus crassirostris* (Swains.). SHINE-EYE.—Common. Resorts in large flocks to the rushes in the low grounds near the mouth of the Rio Cobre at Passage Fort. Breeds also further inland on the estates of Congreve Park and Half-way Tree Pen.

62. *Loxigilla violacea* (Linn.). BLACK SPARROW; BLACK BULLFINCH; COCOA-BIRD; JACK-SPARROW.—Not uncommon, prefers the thickets of low cashaw bushes. A nest with two eggs was taken at Mandeville, May 23.

63. *Euetheia bicolor* (Linn.). GRASS-BIRD; GRASS-QUIT.—Common. Makes its domed nest among low bushes, or upon the 'dildoes' (cacti). Nesting season, May, June and July.

64. *Spiza americana* (Gmel.).—Mr. Lindell of Congreve Park in April, 1889, saw two large flocks of what he supposed were 'Pinks' (*Dolichonyx oryzivorus*). From these he shot many individuals; discovering that they were of some species unknown to him, he made and preserved several skins. One of these he gave to me for identification. It proved to be the Dickcissal. Probably one or more flocks during the migration were driven to the island. There is no evidence that this is a common occurrence; though such may be the case. To Mr. Lindell's knowledge it has not been found there before or since.

65. *Euphonia jamaica* (Linn.). BLUE QUIT.—Rare at Port Henderson. A single nest was found, placed in the center of a bunch of *Tillandsia*; the nicely finished entrance was at the side. The nest was carefully lined with fine grasses.

66. *Spindalis nigricephala* (Jameson). SPANISH QUAIL; CASHEW BIRD.—Rare at Port Henderson and vicinity but common in the interior of the island.

67. *Progne dominicensis* (Gmel.).—Not common.

68. *Petrochelidon fulva* (Vieill.). RAIN-BIRD.—Very common. Breeds in almost all of the caves in which this section abounds. The breeding season begins the last of May and continues through June. June 20 large flocks noted.

69. *Vireo modestus* (Sch.). SEWY-SEWY.—Common. Builds an exceedingly thin walled nest of the characteristic *Vireo* pattern, on low bushes, generally fortified by its position in the center of a patch of *Pinguin*, the serrated edges of whose leaves holds all intruders at bay, unless armed with a machette.

70. *Vireo calidris* (Linn.). JOHN-CHE-WIT.—Very common. Nest more bulky than that of *V. olivaceus*. Breeding season June and early July. Young birds in company with the parents seen July 20.

71. *Cœreba flaveola* (Linn.). BLACK-BACK; CHIM-CHIM.—Common. A most striking peculiarity is the almost invariable fact that the domed nest of this species is placed close, beside the nests of the common yellow-jacket wasp. This would seem to be a protective measure. The nest is usually built near the end of a small limb and not far from the ground. The breeding season is June and early July.

72. *Dendroica petechia* (Linn.). CHIM-CHIM.—Common in the mangrove swamp, and also on the wooded cays off the mouth of Kingston Harbor, particularly Lime and Drunkenman Cays. The breeding season begins in May. July 1, we found the young well grown; July 20, they were flying in numbers. August 1, the old birds were moulting, nearly every one being quite destitute of quills in the tail.

73. *Mimus orpheus* (Linn.). NIGHTINGALE; ENGLISH NIGHTINGALE.—Very common. Breeding season, June and July.

74. *Mimus hillii* (March). SPANISH NIGHTINGALE; FRENCH NIGHTINGALE.—By no means so common as his smaller relative *M. orpheus*, whom he surpasses in size, activity, and power of voice. He is rather a wary bird, and darts from his perch into the thicket at the slightest cause. Its haunts are confined to the Salt Pond hills and low country immediately adjacent.

A nest taken July 12 contained two eggs. The eggs are much larger than those of *M. orpheus*. The spots are smaller and more numerous, while the ground-work is very nearly creamy white with just a trace of the bluish tint. No one could confound them with those of *M. orpheus*. They have a closer resemblance to those of *Harporhynchus rufus*.

NOTES ON PHOTOGRAPHING A LIVE SPECIMEN
OF GAMBEL'S PARTRIDGE.

BY R. W. SHUFELDT.

Plates III-V.

MR. NELSON R. WOOD of the taxidermical department of the U. S. National Museum, owns a beautiful living specimen of Gambel's Partridge (*Callipepla gambeli*). It is a male bird, and at this writing is in full plumage and thoroughly domesticated. He will walk up and down one's arm, feed out of the open hand, and bear stroking without the slightest alarm, or any desire to take flight. Altogether it is one of the best and gentlest little game pets I have ever seen, and has some very interesting traits even in captivity.

Recently the present writer has been engaged upon a paper treating of scientific taxidermy, and in dealing with the game birds, it became necessary to have some good photographs of living Partridges to compare with various examples of mounted ones in the government collections of the National Museum at Washington. Among other birds, Mr. Wood kindly placed this specimen of Gambel's Partridge at my disposition, for the purpose I have named, and it made a most capital subject. Under my supervision the photographs of it which illustrate this article were made by Mr. Smillie of the photographic department of the National Museum.

We first tried to take the bird walking on a table, but after a number of attempts — at least half a dozen — only one really good result was obtained. At last a limb suggested itself to me, and a suitable one was quickly found. On this the bird rested in a number of easy and natural attitudes, but was continually moving withal, and it required absolutely instantaneous exposures to get a result. After about a dozen more attempts several very good ones were secured, and they present us with a variety of instructive points.

In Plate III, a direct left-lateral view of the bird was obtained, at an instant prior to its elevating its plumage for the purpose of



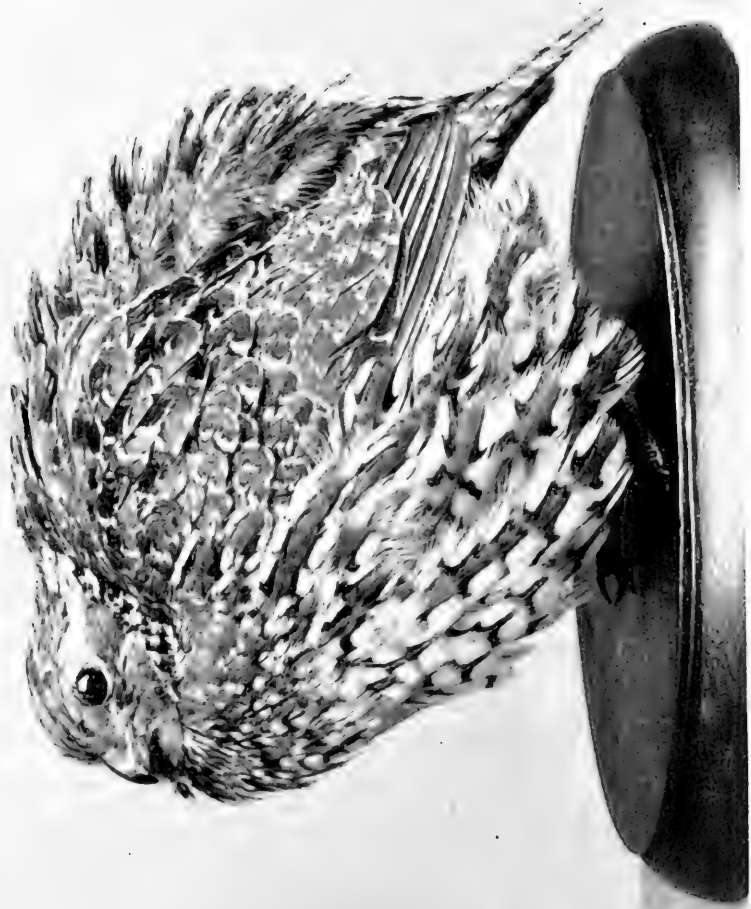
GAMBEL'S PARTRIDGE (*CALLIPEPLA GAMBELII*).

FROM A PHOTOGRAPH OF THE LIVE BIRD.



GAMBEL'S PARTRIDGE (*CALLIPEPLA GAMBELII*).

FROM A PHOTOGRAPH OF THE LIVE BIRD, IN ACT OF PREENSING.



COMMON PARTRIDGE (*COLINUS VIRGINIANUS*), FEMALE.

FROM A PHOTOGRAPH OF A MOUNTED SPECIMEN IN U. S. NATIONAL MUSEUM



preening itself, as shown in Plate IV. One of the feathers of its plume has its shaft broken, and it hangs down, otherwise the picture is perfect. It will be seen that the bird is commencing to close its eyes, and they are almost or quite closed during the act of preening, so as to prevent their being irritated by the feathers. Likewise it will be observed that the elevation of the plumage for this act commences on the crown of the head, and then extends down over the shoulders and upper part of the breast. At this juncture, too, it will be noticed that the anterior line of the facial mask and the line of the lower breast are straight, and that they are parallel to each other.

The next stage is an exceedingly interesting one to get a photograph of, and the result in this case was decidedly successful. It instantaneously follows what is shown in Plate III, and the bird has turned its head, and is scratching the skin of its left shoulder with its bill. It slightly elevates itself upon its legs, and raises all the plumage of the body, as well as the secondaries of the wings. The tail is slightly spread, but its upper and lower coverts enter but very partially into the general act of raising the plumage.

Mr. H. C. Denslow, a very able and observing taxidermist, was, at the time I refer, in the department of birds at the National Museum, and he had made many studies of the postures of living Quails and Partridges with the view of using them in his taxidermical work. He had closely watched specimens of our Common Partridge (*Colinus virginianus*) during the times it preened itself and finally attempted to reproduce one of these in a mounted specimen.

His subject presents a female *Colinus* on the ground. She has been preening, and is here shown just the instant before she gives herself a final shake, prior to bringing the now cleaned and dressed plumage down to her body again. Her head is somewhat sunken between her shoulders, and all her body plumage is elevated. But the wing-feathers are but very slightly raised, and the tail-coverts, very properly, not at all so. Mr. Denslow has never seen my photograph here given in Plate IV, and as it is very probable there is not another one like it in existence, we must believe that, guided as he was by the eye alone, he has attained to a very true result as shown in Plate V.

No doubt *Colinus* frequently assumes just the attitude there exhibited.

At different times I have expressed myself in this journal upon the question of the value of photographs of living birds to the ornithologist, to the taxidermist, and to the artist,—so it will obviate the necessity of my repeating those remarks here.

The kind of photographs to which I had reference are very well exemplified in the Plates illustrating the present contribution,—but how rarely do we yet find them! Most of the attempts I have seen published are of little or no use whatever to the scientist in any department, and even the results themselves are far from pleasing. During my recent studies a vast number of these have been submitted to me for my inspection, and, if possible, use. There has not been one result in fifty of any practical value, and I have been obliged to lay them aside. What we are after is to get *absolutely true* pictures of the forms of birds, and such pictures as can be *used*. More examples than I have been enabled to give in this article will shortly appear in my work on ‘Scientific Taxidermy’ in the next ‘Report of the Smithsonian Institution,’ now in press.



TYMPANUCHUS AMERICANUS ATTWATERI
BENDIRE. ATTWATER'S OR SOUTHERN
PRAIRIE HEN.

BY CHARLES E. BENDIRE.

SINCE my preliminary description of this bird in ‘Forest and Stream’ (Vol. XL, No. 20, May 18, 1893, p. 425) I have examined considerable additional material and am now compelled to consider it as only a well marked race of *T. americanus*. Its subspecific characters are as follows:—

Smaller than *T. americanus*, darker in color, more tawny above, usually with more pronounced chestnut on the neck; smaller and more tawny

MEASUREMENTS OF *Tympanuchus americanus attwateri*.

U. S. National Museum Number.	Collector.	Sex and Age.	Locality.	Date.	Wing.	Tail.	Culmen.	Length of bill fr. nostril.	Tarsus.	Middle Toe.	Depth of bill fr. nostril.	Neck Tufts.
4250	G. Würdemann	♂ adult	Calcasieu Pass, La.	1854	8.20	3.50	.70	.50	2.20	1.80	.35	2.25
126347	Southwick and Critchley	♂	Orange Co., Texas	1885	8.30	3.50	.65	.50	2.20	1.85		2.65
128450	H. P. Attwater (Type)	♂	Refugio Co., "	Mar. 27, '93	8.30	3.30	.71	.50	2.00	1.80	.40	2.50
128482	"	"	"	" 27, '93	8.50	3.15	.67	.50	1.90	1.58		2.90
132508	"	♂	Jefferson "	Jan. 30, '94	8.40	3.67	.65	.52	2.00	1.70	.40	2.50
4249	G. Würdemann	♂	Calcasieu Pass, La.	1854	7.60	3.25	.70	.41	1.90	1.65		
128481	H. P. Attwater	♂	Aranas Co., Texas	Apr. 25, '93	8.15		.80	.50	1.98	1.67		
131177	"	♂	"	Nov. 7, '93	8.00	3.25	.72	.50	2.00	1.72		
131178	"	♂	"	" 7, '93	8.00		.72	.52	1.90	1.62		
132509	"	♀	Jefferson "	Jan. 30, '94	7.65	3.15	.71	.45	1.95	1.75	.37	2.56
Average		♀			8.34	3.42	.68	.50	2.02	1.75	.38	
		♀			7.88	3.22	.73	.48	1.95	1.68	.37	

light colored spots on wing-coverts, and much more scantily feathered tarsus, the latter never feathered down to base of toes, even in front; a broad posterior strip of bare skin being always exposed, even in winter, while in summer much the greater part of the tarsus is naked.

Downy Young.— Head, neck and back, tawny rufous; top of head, back and rump, marked with a greater or less number of brownish black spots; sides and lower parts rich golden buff. The young chicks even show the great difference in the feathering of the tarsi, only the front half being covered, while in *T. americanus* of the same age only a narrow strip of the posterior side is unfeathered. In the latter the feathering in front comes almost if not quite to the base of the toes, while in the former, there is a naked space of more than .10 of an inch.

The subjoined measurements have been kindly taken for me by Mr. R. Ridgway of the Smithsonian Institution.

Habitat.—Coast districts of southwestern Louisiana and southern Texas.

While engaged in working out the geographical ranges of *T. americanus* and *T. pallidicinctus* I received information from Army friends and others stating that Prairie Hens were found along the Gulf coast of Texas, and in order to determine positively which species occurred there, I wrote to a number of parties asking them to procure specimens for me. All the material received was kindly procured by Mr. H. P. Attwater of Rockport, Aransas Co., Texas, and generously donated by him to the U. S. National Museum Collection, and as a slight recognition for his trouble in obtaining these specimens, which proved to be a well marked race, I have named this new subspecies in his honor. The U. S. National Museum already contained three skins which are clearly referable to this subspecies, but the material was not sufficient and in too poor condition to base a new race on.

Attwater's Prairie Hen is considerably smaller than its northern relative, full grown birds averaging only from 25 to 31 ounces. They frequent the low prairie lands near the coast and do not appear to be very common anywhere. They begin nesting about the middle of March, and young chicks, probably three or four days old, were obtained by Mr. Attwater, on April 25, 1893, near the line between Aransas and Refugio Counties, Texas. The crops of three of the specimens sent by Mr. Attwater contained remains of insects and the tops and seeds of different species of leguminous plants.

SUMMER BIRDS OF THE PINE BARRENS OF
NEW JERSEY.

BY WITMER STONE.

THE Pine Barrens of New Jersey have long been renowned as a botanical collecting ground, and the botanists of Philadelphia and vicinity take many excursions every year into this region, which is so easy of access and which presents a flora so absolutely different from that of eastern Pennsylvania that nearly every species is a 'rarity' to one familiar only with the plants of the latter section.

Although the birds of the Pine Barren region are quite as interesting as its flora, ornithologists have been slow to penetrate its deep swamps and to explore its sandy wastes, and slower still to make known the results of their explorations.

It seems strange that Wilson and Audubon should not have visited this region, but so far as we can judge they only explored one or two points near the coast, and did not then make a very thorough investigation, or they would certainly have had something to say of the abundance of such species as the Parula, Hooded and Prairie Warblers and the Tree Swallow, which are almost unknown in summer in eastern Pennsylvania. Even Cassin and Turnbull seem to have been unfamiliar with the fauna of the Pine Barrens, to judge from the few scattered statements regarding some of the above species which they have made.

The Pine Barrens occupy the whole of southern New Jersey south of a line from Long Branch to Salem, excepting the maritime marshes and a narrow strip bordering the Delaware River. They consist of a low, flat stretch of sandy ground, some parts forming dreary wastes of loose sand, with a scattering growth of scrub pines and oaks (*Quercus nigra* and *Q. ilicifolia*), and in others covered with continuous pine woods of the taller pitch pine (*Pinus rigida*). Scattered throughout the region, especially along the sluggish streams, are almost impenetrable swamps of white cedar (*Chamæcyparis thyoides*) bordered by thickets of holly and various ericaceous bushes, and numerous open sphagnum and cranberry bogs.

Portions of this region, especially in Atlantic County, are still quite wild and comparatively uninhabited. Deer (*Cariacus virginianus*) are shot here every winter, and along the upper Egg Harbor River a few bears (*Ursus americanus*) in all probability still exist.

The Pine Barrens lie entirely within the Carolinian Fauna and are, generally speaking, much richer in southern types than the southeastern portion of Pennsylvania. Many species of insects and plants are found there which do not occur farther north in the State, nor to the west of the Delaware River. A number of Carolinian birds also occur abundantly, but some other species quite as characteristic of this fauna, and which are found regularly in southeastern Pennsylvania, are conspicuous by their absence. This is undoubtedly due to the peculiar environment, which is not suited to their habits.

The occurrence of such a boreal type of mammal as the Red-backed Mouse (*Evotomys*) in the Pine Barrens is probably accounted for by the fact that it here inhabits the cool sphagnum bogs and is chiefly nocturnal, so that the environment during the time of its activity would be quite congenial.

No northern species of birds have yet been found breeding in the Pine Barrens, unless the Redstart be so considered, for although it occurs sparingly in other parts of the Carolinian belt, it is much more characteristic of the Alleghanian fauna.

Of the birds which characterize the dry scrub barrens the Towhee, Ovenbird and Prairie Warbler are the most conspicuous. The latter species is especially numerous, and its song is heard continually as it flits about among the low pines and scrub oaks. Wherever the tall pines occur the Pine Warbler abounds, frequenting the topmost branches, among the bunches of cones or clinging to the trunk in the manner of a Creeper. In the thickets bordering the cedar swamps are heard the notes of the Carolina Chickadee and White-eyed Vireo, but the most interesting bird of these localities is the Parula Warbler. Everywhere throughout the swamps the bushes are covered with great masses and festoons of the delicate gray lichen or 'beard-moss' (*Usnea barbata*), and where this grows thickest the Parulas abound. They nest exclusively in the bunches of lichens; selecting some convenient bunch they loop and weave together the

hanging portions so as to form a receptacle for their eggs. Sometimes the nest occupies the very center of a large mass of the lichen, and so little do these bunches of lichen differ from those which have not been made to do service as nests that it is often quite impossible to distinguish between them. In the swamps bordering the small lakes near Dennisville, Cape May County, these little Warblers are especially abundant.

In Atlantic County, above May's Landing, the damming of the Egg Harbor River, which was accomplished many years ago, has resulted in the flooding of several large cedar swamps through which the river formerly flowed, so that now the surface of the stream, nearly a quarter of a mile in width, is covered with the bare and bleached trunks of the cedars and other trees, which appear like a dense forest of telegraph poles.

These rotten trunks have not been overlooked by the birds, and several species here find congenial nesting sites; but although they would seem to be safer from molestation here than on the land, one would think that it must fare badly with the young in their first attempts at flying. The Flickers were probably the first settlers, so to speak, of this aquatic colony, and they still nest in the larger trunks, the bottoms of their nests being in many cases but a few inches above the surface of the water.

In the old Flickers' nests, or inside the fragile bark shells of the stumps most advanced in decay, the Carolina Chickadees and Tree Swallows form their nests. In addition to these birds a few Kingbirds and Robins occupy the stumps of such trees as were formerly used by the Flickers, and which have broken off so as to leave the bottoms of the old excavations as convenient receptacles for the structures of the succeeding tenants.

A list of the species known to summer in the Pine Barrens follows. This is based mainly upon my own experience, but I am also indebted for many interesting notes to various members of the Delaware Valley Ornithological Club, especially to Messrs. S. N. Rhoads, J. H. Reed, C. A. Voelker, M. L. C. Wilde, and I. N. DeHaven.

1. *Aix sponsa*. WOOD DUCK.—Frequent along the Egg Harbor and other rivers.

2. *Ardea herodias*. GREAT BLUE HERON.—Seen throughout the year, and doubtless some heronries are to be found in the dense cedar swamps, although I have never seen any nests.

3. *Ardea virescens*. GREEN HERON.—Abundant.
4. *Nycticorax nycticorax nævius*. NIGHT HERON.—Frequent, though I have never seen any heronries in the Barrens.
5. *Rallus elegans*. KING RAIL.—A nest of this species was found July 15, 1892, by Dr. J. B. Brinton, in a cedar swamp near Repaupo, which lies on the outskirts of the district. The species may also breed farther inland.
6. *Philohela minor*. WOODCOCK.—Tolerably common.
7. *Actitis macularia*. SPOTTED SANDPIPER.—Tolerably common.
8. *Colinus virginianus*. BOB-WHITE.—Common, especially in Cape May County. The present birds are largely from introduced stock.
9. *Bonasa umbellus*. RUFFED GROUSE.—Tolerably common in the wilder parts of Atlantic County.
10. *Zenaidura macroura*. MOURNING DOVE.—Tolerably common.
11. *Cathartes aura*. TURKEY VULTURE.—Common throughout the Pine Barrens, and is to be seen during the entire year, though less common in winter.
12. *Circus hudsonius*. MARSH HAWK.—Not very common, but may breed occasionally, as a nest was taken on Long Beach by Mr. W. E. D. Scott (Bull. Nutt. Orn. Club, 1879, p. 222).
13. *Accipiter velox*. SHARP-SHINNED HAWK.—Rather common.
14. *Accipiter cooperi*. COOPER'S HAWK.—Tolerably common.
15. *Buteo borealis*. RED-TAILED HAWK.—Tolerably common.
16. *Buteo latissimus*. BROAD-WINGED HAWK.—Tolerably common. I have no actual record of the breeding of these four Hawks in the Pine Barren district, but individuals are seen during the summer and they doubtless all nest in the pine forests.
17. *Haliaeetus leucocephalus*. BALD EAGLE.—A few pairs are seen all the year along the coast and doubtless breed in the cedar swamps. A pair was observed daily near Dennisville, Cape May County, in May, 1891, and was reported to have a nest in the vicinity.
18. *Falco sparverius*. SPARROW HAWK.—Common.
19. *Pandion haliaëtus carolinensis*. OSPREY.—Common, breeding along the edge of the Pine Barrens towards the salt marshes.
20. *Asio accipitrinus*. SHORT-EARED OWL.—Rare. Breeds on the marshes at Long Beach (Scott, Bull. Nutt. Orn. Club, 1879, p. 202), and perhaps in the Pine Barren swamps.
21. *Megascops asio*. SCREECH OWL.—Common.
22. *Bubo virginianus*. GREAT-HORNED OWL.—Not common but pretty generally distributed through the pine woods.
23. *Coccyzus americanus*. YELLOW-BILLED CUCKOO.—Not common.
24. *Ceryle alcyon*. KINGFISHER.—Along the larger streams and small lakes.
25. *Dryobates villosus*. HAIRY WOODPECKER. Common.

26. *Dryobates pubescens*.¹ DOWNY WOODPECKER. This species and the preceding occur in about equal numbers.
27. *Ceophloeus pileatus*. PILEATED WOODPECKER.—Two specimens of this bird were secured by Dr. W. L. Abbott in Cape May County (No. 26675, Nov. 7, 1878, and No. 26676, Dec. 31, 1879, Coll. Acad. Nat. Sci. Phila.). Although both were secured in winter, the species is generally resident where found, and the birds may have bred in the Barrens. None have been taken since, so far as I am aware.
28. *Colaptes auratus*. FLICKER.—Abundant.
29. *Antrostomus vociferus*. WHIP-POOR-WILL.—Common in the dense swamps of Cape May County, and probably in other parts of the Pine Barren region, emerging at dusk into the open ground, especially about old deserted farms.
30. *Chordeiles virginianus*. NIGHT HAWK.—Common in dry, sandy situations, but rather local in its distribution.
31. *Chætura pelagica*. CHIMNEY SWIFT.—Abundant, mainly in the vicinity of dwellings.
32. *Trochilus colubris*. HUMMINGBIRD.—Very common in Cape May County, much more so than in eastern Pennsylvania.
33. *Tyrannus tyrannus*. KINGBIRD.—Very common throughout the open scrub barrens.
34. *Myiarchus crinitus*. CRESTED FLYCATCHER.—Common along the edges of the cedar swamps.
35. *Sayornis phœbe*. PHŒBE.—Tolerably common.
36. *Contopus virens*. WOOD PEWEE.—Common in the cedar swamps.
37. *Empidonax acadicus*. ACADIAN FLYCATCHER.—Messrs. J. H. Reed and M. L. C. Wilde took nests of this species in Cape May and Cumberland Counties in 1893, but it is not a commonly distributed species in the region.
38. *Cyanocitta cristata*. BLUE JAY.—Common.
39. *Corvus corax principalis*. RAVEN.—Several pairs of Ravens at least still breed in the cedar swamps of southern New Jersey. All the year the birds visit the sea coast from Atlantic City to Cape May and are frequently observed. One pair has bred for a number of years near Tuckerton as I have been informed by Mr. G. B. Benners, and Mr. S. N. Rhoads has heard the same thing from the Jillson Bros. of Tuckerton who have visited nests in this vicinity. Another pair of Ravens was observed daily by Mr. S. N. Rhoads and myself near May's Landing during February, 1893, and we were informed that they nested every year in a cedar swamp just above that locality. As the relationship of the Ravens

¹ Audubon gives *Dryobates borealis* as occurring in New Jersey, and Mr. Ridgway includes this State in the range of the species without any further evidence. We have been unable, however, to find any records of the capture of this species anywhere in either Pennsylvania or New Jersey, except one specimen supposed to have been taken near New York City (Lawrence, Ann. Lyceum Nat. Hist., VIII, p. 291).

of the eastern United States is a question of general interest I have given the measurements of two New Jersey specimens in the collection of the Philadelphia Academy as well as those of typical examples of *C. c. principalis* and *C. c. sinuatus* from the same collection. On the whole I think the New Jersey birds come nearer to the former race, as does also a specimen from Ft. Riley, Kansas, which is included in the list below.

Corvus corax principalis.

		Culmen to extr. Base.	Depth of Bill through Nostril.	Wing.	Tarsus.
30143	McCormick Bay, Greenland.	3.08 in.	1.10	17.75	2.45
30195	" " " "	2.67	1.07	17.50	2.38
3295	New Jersey.	2.62	1.05	17.10	2.50
3314	" " "	2.90	1.09	17.25	2.50
2817	Ft. Riley, Kansas.	2.88	1.08	18.10	2.52

Corvus corax sinuatus.

2815	California.	2.45	1.00	17.00	2.50
2820	"	2.50	.92	15.50	2.32
27620	Oracle, Arizona.	2.60	1.00	16.25	2.33

40. *Corvus americanus*. CROW.—Common.

41. *Corvus ossifragus*. FISH CROW.—While this species occasionally visits the Pine Barrens and may possibly breed on its borders it is generally confined to the immediate vicinity of the sea coast, nesting in the isolated clumps of pines which occur here and there on sandy 'islets' in the salt meadows.

42. *Molothrus ater*. COWBIRD.—Not common. Have taken its egg in one instance in the delicate nest of the Parula Warbler, but how it was deposited is somewhat of a mystery, as the opening seemed entirely too small to admit the intruder.

43. *Agelaius phœniceus*. RED-WINGED BLACKBIRD.—Very common along the Egg Harbor River and other large streams as well as on the partly brackish swamps bordering the eastern side of the Pine Barrens.

44. *Sturnella magna*. MEADOW LARK.—Rare, and confined to the open cultivated districts and to the salt meadows to the east.

45. *Icterus spurius*.¹ ORCHARD ORIOLE.—Tolerably common.

46. *Quiscalus quiscula*. PURPLE GRACKLE.—Not common except in the vicinity of towns.

¹The Baltimore Oriole seems to be quite rare in this region, and I do not recollect ever seeing one in summer.

47. *Spinus tristis*. GOLDFINCH.—Tolerably common.
48. *Poocætes gramineus*. VESPER SPARROW.—Common in open cultivated ground.
49. *Ammodramus savannarum passerinus*. YELLOW-WINGED SPARROW.—Occasional in open ground.
50. *Ammodramus henslowi*. HENSLOW'S SPARROW.—This species was taken August 16, 1886, by my friend Mr. A. P. Brown near Point Pleasant, N. J., in a swamp bordering the Pine Barrens, and was evidently breeding there. Others were seen in the same place in subsequent years.
51. *Ammodramus caudacutus*. SHARP-TAILED SPARROW.
52. *Ammodramus maritimus*. SEA-SIDE SPARROW.—These two salt marsh species follow the borders of some of the rivers and streams within the edge of the Pine Barrens but do not occur in the region proper.
53. *Spizella socialis*. CHIPPING SPARROW.—Common, mostly about dwellings.
54. *Spizella pusilla*. FIELD SPARROW.—Common throughout the low scrub barrens.
55. *Melospiza fasciata*. SONG SPARROW.—Abundant.
56. *Pipilo erythrophthalmus*. CHEWINK.—Very common throughout the scrub barrens and on the edges of the swamps.
57. *Cardinalis cardinalis*. CARDINAL.—Not very common.
58. *Passerina cyanea*. INDIGO BIRD.—Not common.
59. *Progne subis*. PURPLE MARTIN.—Common, mainly along the large streams, nesting about buildings and in boxes.
60. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Messrs. Reed and Wilde secured some nests of this species in Cape May County, but it is not generally distributed.
61. *Chelidon erythrogaster*. BARN SWALLOW.—Very common.
62. *Tachycineta bicolor*. TREE SWALLOW.—Abundant throughout the Pine Barrens, especially along the large streams.
63. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.—Rather common in localities suited to its habits. Although the Bank Swallow may breed in the region, all the colonies which I have examined proved to be of this species.
64. *Ampelis cedrorum*. CEDAR BIRD.—Not very common during the breeding season, but some undoubtedly remain.
65. *Lanius ludovicianus*. LOGGERHEAD SHRIKE.—I have observed a few of these birds every summer for several years in the vicinity of Cape May and have no doubt that they breed there.
66. *Vireo olivaceus*. RED-EYED VIREO.—Common.
67. *Vireo noveboracensis*. WHITE-EYED VIREO.—Very common in the swamps where it is one of the most characteristic species.
68. *Mniotilta varia*. BLACK-AND-WHITE WARBLER.—Common throughout the Pine Barrens.
69. *Compsothlypis americana*. PARULA WARBLER.—Very common in swampy locations wherever the *Usnea* is to be found.

70. *Dendroica aestiva*. YELLOW WARBLER.—Rather common in many localities, mostly along the large streams.

71. *Dendroica vigorsii*. PINE WARBLER.—Very common wherever the taller pines are to be found.

72. *Dendroica discolor*. PRAIRIE WARBLER.—Very common throughout the low scrub barrens.

73. *Seiurus aurocapillus*. OVEN-BIRD.—Common.

74. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—Very common.

75. *Icteria virens*. YELLOW-BREASTED CHAT.—Not common.

76. *Sylvania mitrata*. HOODED WARBLER.—In all the dark cedar swamps this species is to be found, and its note is one of the most familiar sounds. In Cape May County it is especially abundant.

77. *Setophaga ruticilla*. REDSTART.—Messrs. Reed and Wilde secured nests of this species in Cape May County, but it is not generally distributed.

78. *Mimus polyglottos*. MOCKINGBIRD.—I secured a specimen of this bird at Cape May Point, August 27, 1891, which was still in the worn breeding plumage, so that it seems probable that it nested in the vicinity. The species is reported to still breed near Tuckerton occasionally, but I have been unable to get any definite information on the subject. It is certainly very rare in New Jersey.

79. *Galeoscoptes carolinensis*. CATBIRD.—Common.

80. *Harporhynchus rufus*. BROWN THRASHER.—Common.

81. *Thryothorus ludovicianus*. CAROLINA WREN.—Rather common.

82. *Troglodytes aëdon*. HOUSE WREN.—Not very common; only seen about houses.

83. *Cistothorus palustris*. LONG-BILLED MARSH WREN.—This species, which is mostly restricted to tide water swamps, follows the course of the larger streams for some distance back into the Pine Barrens, and I have found it breeding a mile above May's Landing in a swamp which borders the dam on the Egg Harbor River at this point.

84. *Sitta carolinensis*. WHITE-BELLIED NUTHATCH.—Tolerably common.

85. *Parus bicolor*. TUFTED TITMOUSE.—Not very common.

86. *Parus carolinensis*. CAROLINA CHICKADEE.—Very common throughout the Pine Barrens.

87. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Mr. W. L. Baily has taken the nest of this species at Bridgeton, and Messrs. I. N. DeHaven and C. A. Voelker have obtained specimens respectively at Atlantic City and Dennisville during spring. It is, however, of decidedly rare occurrence.

88. *Turdus mustelinus*. WOOD THRUSH.—Not common, and confined to the dense cedar swamps.

89. *Merula migratoria*. ROBIN.—Common.

90. *Sialia sialis*. BLUEBIRD.—Tolerably common.

THE TONGUE OF THE CAPE MAY WARBLER.

BY FREDERIC A. LUCAS.

IN SEEKING to unravel the tangled skein of passerine birds, and to straighten out its intermingled loops, the taxonomist has sought to avail himself of every possible character, and, from the development of the embryo to the markings on the egg shell, little has been left untried.

While the character of the tongue has not been overlooked, comparatively little use has been made of it, partly on account of the time and trouble required for the careful study of this organ, and partly perhaps from a doubt as to its value. In his 'Review of North American Birds' Prof. Baird, in treating of the family Sylviolidæ, compared the tongues of several species of this group with those of several species of Cœrebidæ, drawing particular attention to the tongue of *Dendroica tigrina* and, mainly on this character, basing the genus *Perissoglossa*.

Quite recently Dr. Gadow, in his paper on the 'Structure of Certain Hawaiian Birds,' has laid considerable stress upon the shape and structure of the tongue, using it as the principal character of one of his alternative keys to the arrangement of the families of birds therein discussed. Both Prof. Baird and Dr. Gadow have dwelt to some extent on the tongue of the Cœrebidæ, the one using it to unite these birds with the Sylviolidæ, the other to ally them with the Drepanididæ.

In this connection arise the questions: What is the exact taxonomic value of the tongue? and how constant is its pattern in any given group? To these I would add another query: To what extent is the food of a bird indicated by the shape of the tongue?

It is much easier to ask these questions than to answer them, and I am very far from being ready with a reply; still, having had occasion to recently examine the tongues of a number of birds, I am at least partly prepared with a response as to my own ideas on the subject. It would seem that the soft parts of birds would naturally be more plastic than the hard, and that while the bone yields more or less to the pull of the muscle and

is changed by internal and external conditions, that such organs as the tongue and viscera would be more easily influenced, especially by any change, either from choice or necessity, in the character of a bird's food. If this be so, we should find differences between these parts in nearly related birds, while at the same time it should not surprise us to discover resemblances between them among forms separated by space, or skeletal structure, but whose food habits are similar.

Cæreba cærulea and *C. cyanea* are certainly near relatives, and their skulls are so much alike that I doubt my ability to tell them apart, but their tongues, although the same in structure, differ so decidedly that they may be distinguished from one another at a glance. Unfortunately, for lack of material, I can carry the subject no farther and am unable to say whether or not the tongue of *cærulea* is typical of the plainer colored species. Now about as far from America as one can readily get, in New South Wales, we find that one of the Honey-suckers (*Acanthorhynchus tenuirostris*) has a tongue structurally like that of *Cæreba*, but elaborated and refined to a greater degree, being more slender, more tubular, and more finely feathered. Judged by cranial characters the two birds are widely separated, for, as Dr. Parker has pointed out, the palate of *Acanthorhynchus* has a feature in the relations of the premaxillaries and palatines found in the Ostrich but exceptional higher up the scale. Coming back to America, to the genus *Dendroica*, we will find that while the tongues of various species are constructed on the same plan, that there is great specific variation in the execution of details, the extremes, so far as I have examined, being marked by *Dendroica maculosa* and *D. tigrina*, and that while these extremes are widely separated, yet the gap between them is bridged over by other species which show intermediate stages. The Tanagers, too, show considerable diversity in their tongues, some being thick and fleshy, others thin and horny, while there is much less uniformity of plan in these birds than in the Warblers. While these facts are entirely too few to form the basis of a reply to the question, What is the value and constancy of pattern of the tongue? they seem at least to hint that while there may be a certain general structural plan in a given group of birds, that this plan is subject to great specific varia-

tions in its details, and cannot be too surely relied on, since it is liable to be copied by outsiders.

Next as to the relationship between food and tongue. The Sandwich Islands Drepanididæ have a most perfect tubular tongue, such as one might make on a gigantic scale by curling up the edges of a long slip of paper until they meet, and then tying them firmly in place. These birds (some of them at least) have, like the Meliphagidæ, a suctorial apparatus, so that if they do not feed on nectar it is not for lack of ability to do so. And yet some of these birds, as their stomachs testify, feed on fruit and some on spiders and insects. *Certhiola* has a brushy, twisted tongue, such as we find in some of the Meliphagidæ, but while these last are said to be honey-suckers *par excellence*, *Certhiola* seems to have a decided liking for insects.

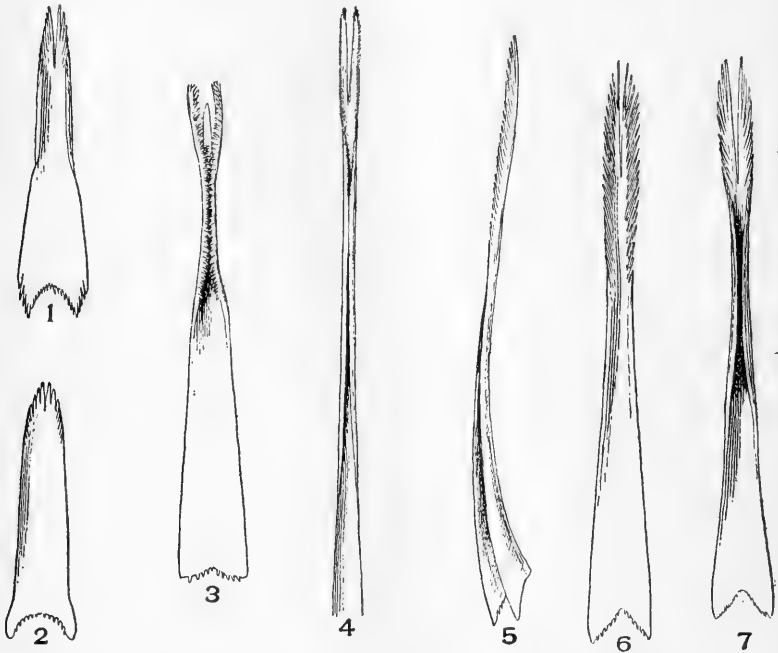
In the genus *Cæreba* (or *Abelorchina*) as well as in *Glossoptila*, the tongue seems admirably fashioned for catching insects or sucking honey, and these birds feed on berries. So with the Hummingbirds, which have a good suctorial tongue and yet feed principally on insects, although they may perhaps have honey for dessert.

Just here I wish to forestall a possible criticism. It is quite likely that in the cases just mentioned the birds may feed at some seasons on fruit, and at others on insects, but the point I would make is that even if they do, the tongue is no certain guide to the nature of the birds' food.¹

Coming finally to *Dendroica tigrina*, whose tongue has been used as a peg on which to hang this paper, if any one will take the trouble to compare the figure accompanying this paper—which was made from a specimen collected by my friend Mr. William Palmer—with figure 5, page 163, 'Review of North American Birds,' he will find that they do not agree with one another. If comparison is made with figure 4 of the same work, it will be seen that, making allowance for the personal equation of the two draughtsmen, the figures agree very well. If the tongues of *Cæreba* herein figured (Fig. 5-7) be compared

¹ Mr. F. M. Chapman (Bull. Am. Mus. Nat. Hist. VI, p. 26) says that in Trinidad *Abelorchina cærulea* and *A. cyanea* feed on the blossoms of the *bois immortel*, but he does not say that he examined the stomachs of any birds. Query: Were the birds after nectar or insects?

with 3 and 5 (same work) their structural resemblance will be evident, and the conclusion is unavoidable that, as at Babel, there has been a confusion of tongues, and that the principal character of the genus *Perissoglossa* has originated in a mistake. Granting, however, that the tongue had been as figured, it hardly seems that the characters would have been sufficiently solid to form the foundation for a genus.



ENLARGED FIGURES OF TONGUES OF BIRDS: 1. *Dendroica tigrina*; 2. *D. maculosa*; 3. *Glossoptila campestris*; 4. *Acanthorhynchus tenuirostris*; 5 and 6. *Careba cyanea*; 7. *C. carulea*.

It may be said further that the tongue of *Certhiola* is also wrongly figured in the 'Review of North American Birds,' for it is not fimbriated, but brushy and twisted. Unfortunately such errors are bound to occur, and we must ever be on the watch for them; and I will only say in conclusion that if any one thinks them inexcusable, let him try to dissect and figure a dozen similar specimens and the crime will perhaps seem to have some extenuating circumstances.

ON GEOGRAPHICAL VARIATION IN *SIALIA*
MEXICANA SWAINSON.

BY ROBERT RIDGWAY.

IN October, 1889, Mr. A. W. Anthony, of San Diego, California, described, in the 'Proceedings' of the California Academy of Sciences (2d Ser., Vol. II, p. 79), under the name *Sialia mexicana anabelæ*, a supposed new race of *Sialia mexicana*, resident on the San Pedro Martir Mountains, Lower California. A small number of specimens were sent to me by Mr. Anthony for examination, and upon this insufficient evidence an unfavorable opinion was formed as to the validity of the form. It was accordingly considered by the A. O. U. Committee on Publications ineligible for admission to the Check List on the ground that its characters were "deemed not sufficiently constant." (See 'The Auk,' Jan. 1890, p. 66.)

Not satisfied with the disposition made of it by the A. O. U. Committee, Mr. Anthony again visited the San Pedro Mountains and collected a large number of specimens, which he forwarded to me, early in November, 1893, for examination by the Committee; but the question of its status not having been raised during the year no action could properly be taken concerning it. It is for the purpose, therefore, of having this question available for consideration by the Committee at its next session that this paper has been prepared; for I am now convinced that an error was committed in rejecting the new subspecies which Mr. Anthony had described.

In order to clearly understand the nature and value of the characters presented in the resident birds of this species from Lower California, it has been found necessary to bring together for comparison as many specimens of the species, from all parts of its range, as possible. No difficulty has been experienced in getting a pretty good series of the common form of the western United States (*S. mexicana occidentalis*) and, thanks to Mr. Anthony, of the resident race of the Lower California mountains (*S. m. anabelæ*); but of the bird resident in southern Mexico (true *S. mexicana*), very few specimens — only 10 — could be

obtained, and for 9 of these I am indebted to Dr. C. Hart Merriam, Chief of the Division of Economic Ornithology, Department of Agriculture, the National Museum collection containing a single specimen only. Although so small, numerically, this series is highly important, as showing that the resident birds of southern Mexico alone are entitled, unqualifiedly, to the name *Sialia mexicana*, a fact which would not have been evident without them.¹

The number of specimens examined in connection with this paper and the sources from whence obtained are shown in the following tables:—

	♂	♀	Total.
I. <i>Sialia mexicana</i> Sw.	6	4	10
II. <i>S. m. occidentalis</i> (Townsend).	82	23	105
III. <i>S. m. anabelæ</i> Anthony.	44	18	62
Total,	132	45	177

	I.	II.	III.	Total.
A. W. Anthony.	—	32	60	92
National Museum.	1	67	2	70
Division of Ornithology.	9	—	—	9
H. W. Henshaw.	—	6	—	6
Total,	10	105	62	177

The conclusions reached after very careful examination and comparison of the large number of specimens examined may be summarized as follows:—

(1) Although the *Sialia mexicana* of Swainson was plainly based on a specimen (from the "tableland of Mexico") having the back entirely blue, the series of specimens from southern Mexico, though small, is sufficient to show that such is by no means a constant—probably not even usual—character of the Mexican form. But these southern resident birds, besides averaging considerably larger than any others, are of a much deeper or darker, more purplish, blue color, and the females, at least,

¹ The northern and southern forms were, however, duly separated in 1881 by Mr. Henry Seebohm, in Volume V of the 'Catalogue of Birds in the British Museum' (pp. 331-333), though one of the supposed differential characters proves to be altogether unreliable.

have a far greater amount of cinnamon or rusty coloring on the under parts.

(2) A series of nearly 50 adult males collected during the breeding season on the higher parts of the San Pedro Martir Mountains, Lower California, present as practically constant characteristics several features which, individually, are very rarely and in combination with one another never, seen in a still larger series (82 adult males) collected in various portions of the western United States and in Mexico. These peculiarities of the Lower Californian bird consist in (1) the entire absence or scarcely obvious development of chestnut on the back, (2) separation of the chestnut on the breast into two lateral patches by the longitudinal extension of the blue of the throat to that of the belly, (3) greater average size, especially of the bill, and (4) appreciably deeper, richer blue color of the upper parts, with the blue of the throat—often that of the breast and upper belly also—nearly or quite as intense as that of the upper parts.

(3) The extensive series from the western United States, representing numerous localities from southern California to Washington on the Pacific coast and western Texas to Colorado in the interior, as well as from the northern and western States of Mexico, show great variations in plumage which are of a decided geographical significance¹ and may require subdivision of the series into two forms. The birds of this series are almost invariably smaller than those of the two preceding groups. They have, with few exceptions, the back more or less extensively chestnut, and the chestnut of the breast is almost invariably broadly continuous anteriorly. In 31 specimens from Colorado, New Mexico, Arizona, northern Mexico and western Texas all but 2 (both autumnal birds from New Mexico) have the back and scapulars 'solid' chestnut, at least laterally and, broadly,

¹ Professor Baird first called attention to these variations in 'Birds of North America' (1858), p. 223, as follows:—

"The reddish brown of the back and breast is in the form of lateral patches, meeting more or less narrowly on the central line. Sometimes in the middle of the back it does not meet at all, and at others it is quite broadly continuous. The latter is most frequently seen in Rocky Mountain specimens. . . . Specimens from California occasionally have but little brown on the back, but it is almost always distinctly visible."

across the anterior portion. Among 34 specimens from Washington, Oregon, California, and the western edge of Nevada only 6 are of this character, the remainder having the chestnut of the back separated into two lateral patches, barely coalescing for a slight extent in a few specimens only, and often reduced to two widely separated and greatly restricted areas. The six exceptions are 1 from Fort Tejon (August 7), 1 from Walker's Basin (November 5), 2 from Berryessa (November 14 and December 8), 3 from Santa Isabel, San Diego Co. (December 29 and February 15), 1 from Murphy's, Calaveras Co. (winter), and 1 from San Francisco. The latter is without date, but is in spring or summer plumage; and being obtained from a dealer's stock may well be ignored. The others are all fall or winter specimens,¹ and, except that from Murphy's, from southern California, may have been migrants from the eastward.

The type of *Sialia occidentalis* Townsend is a bird of the western style, with perhaps a little more than the average amount of chestnut on the back. Whether the type of *S. caruleocollis* Vigors was also a representative of this style probably cannot now be determined, neither the description² nor colored figure being sufficiently accurate to permit positive identification, while nothing whatever is said as to its locality.

While hesitating to formally separate the Rocky Mountain bird I believe it will yet be found necessary to do so; and in view of this probability would suggest for it the name *Sialia mexicana bairdi*,³ in respectful memory of Professor Baird, as well as a proper recognition of his discovery of the geographical variations referred to.⁴

¹ The one from Fort Tejon, although taken in August, had nearly completed the fall moult.

² See foot-note on page 155.

³ Type, No. 7637, U. S. National Museum, Camp 110, New Mexico, Jan. 31, 1854; Kennerly & Möllhausen.

⁴ Since the above was written I find on reference to some memoranda which I made concerning specimens not now available for examination, that among specimens previously examined were the following having the back wholly chestnut: Beaverton, Oregon, 2; Wilson's Peak and Alhambra, southern California, 3. On the other hand, among those with the back only partly chestnut were the following: Beaverton, Oregon, 13; Wilson's Peak and San Diego, California, 1 each; Granite Gap, New Mexico, 1.

The amount of chestnut on the back is usually more or less correlated with a similar variation of that on the breast; but not always so. Of the specimens now at hand of *S. m. occidentalis* in its larger sense (that is, including both the typical form and the chestnut-backed style which I have named, provisionally, *S. m. bairdi*), only 6 out of a total of 65 have the chestnut of the breast nearly or quite divided into two lateral patches, these all of the western style, the localities represented being as follows: Ft. Steilacoom, Washington, 1 (April 17); Mt. Lassen, California, 1 (July 4); Nicasio, California, 1 (April 11); Mt. Whitney, California, 1 (October 23); Carson City, Nevada, 1 (February 21); and Genoa, Nevada, 1 (June 20). These all have very little chestnut on the back, amounting in the Genoa specimen to a mere trace, observable only on the closest inspection.¹

The chestnut on the breast is as a rule decidedly broader in the birds with wholly brown backs, but occasionally an example with very little chestnut on the back will be found with the maximum width of that color across the breast. There is so much individual variation in the intensity of this color that it is difficult to tell whether in one form it averages deeper than in the other; but apparently it averages paler in the coast form.

From the foregoing it will be seen that while the presence or absence of chestnut on the back and the degree to which it is developed is largely a variable individual character and only

Dr. A. K. Fisher has examined a series of 10 adult males in the collection of the Division of Ornithology, U. S. Department of Agriculture, with the view of testing this character, and kindly submits the following result:—

Back with more or less blue: Pyramid Lake, Nevada, 2 (June 24); Prescott, Arizona, 1 (June 21).

Back entirely chestnut: Fort Davis, Texas, 1 (Jan. 2); Kanab, Utah, 1 (Dec. 26); San Francisco Mts., Arizona, 1 (August); Charleston Mts., Nevada, 1 (February); Mt. Whitney, California, 1 (Sept. 4); San Bernardino, California, 2 (Dec. 30).

It will thus be seen that this material, in the main, bears out the geographical significance of the variation in question, though the two examples with wholly chestnut backs from Beaverton, Oregon (which is on the west side of the mountains and near the Columbia River), in addition to other exceptions to the rule, show clearly that the variation is not strictly geographical.

¹ These six examples bear a very close resemblance to *S. m. anabelæ*, but may be separated by their decidedly more slender bill, and, except in the case of the one from Fort Steilacoom and that from Genoa by the perceptibly lighter shade of blue and lighter chestnut on the sides of the breast.

partially correlated with locality, its absence or very slight development is the rule among the birds of this species resident on the high mountains of Lower California; that it is never (?) wholly absent though sometimes very slightly developed among those from the Pacific coast district north of Lower California, from which area most specimens have the chestnut on the back moderately developed, that is, almost always more or less interrupted (often widely) by blue along the median line; and that among those from the interior plateau region the back is, as a rule, entirely chestnut.

The series of resident Mexican birds is much too small to admit of even a guess as to which style of plumage prevails among them.

I have taken advantage of the opportunity offered by the large series of specimens brought together as the basis of this paper, to prepare descriptions of typical specimens of the several forms, representing the two sexes in these seasonal adult plumages, which are presented herewith, together with their principal synonymy and various critical observations.

The preparation of a 'key' for the ready identification of specimens has proven a matter of extreme difficulty, for the reason that no single character will serve for the definition of any form, the nearest approach to constancy of a single character being, so far as the material examined indicates, the much darker, more purplish, blue of the resident birds of southern Mexico and the wholly chestnut back of the birds from the plateau region of the United States.

I am aware the following attempt at a key is very unsatisfactory; but on account of the fact that our series of true *S. mexicana* is very inadequate, and not wholly sufficient as to the other forms (the proportion of specimens obtained during the breeding season being too small), it is the best I have been able to devise.

- A. Chestnut color of back extremely variable in amount, sometimes entirely absent, but in the latter case chestnut of breast continuous anteriorly.
- a. Back usually (?) with little if any chestnut; blue of upper parts of a rich deep 'smalt' hue; wing in adult male averaging 4.38. (Highlands of southern Mexico.) 1. *S. mexicana* SWAINS.

- b. Back usually with much chestnut, often wholly so, very rarely with a mere trace; blue of upper parts varying from rich ultramarine to light cobalt; wing in adult male averaging 4.07.
- α¹. Back with median portion more or less blue, the chestnut sometimes restricted to a mere trace on each side. (Pacific coast, from British Columbia to southern California, east to western Nevada, casually, during migrations, to New Mexico.)
2. *S. m. occidentalis* (TOWNS.).
- β². Back wholly chestnut. (Rocky mountain district south to northern Mexico.)
3. *S. m. bairdi* RIDGW.
- B. Chestnut color of back and breast greatly reduced in extent, usually wholly wanting or barely indicated on the former, and divided into two lateral patches by backward extension of blue of throat on the latter. Blue of upper parts intermediate between 'smalt' and ultramarine; wing in adult male averaging 4.29. (Mountains of Lower California.)
4. *S. m. anabellæ* ANTHONY.

1. *Sialia mexicana* SWAINSON.

MEXICAN BLUEBIRD.

Sialia mexicana SWAINS. F. B.—A. II, 1831, 202, foot-note (tableland of Mexico 1).—SCL. P. Z. S. 1856, 293 (Cordova²); 1859, 362 (Jalapa²); Catal. 1862, 11 (part, Jalapa).—SUMICHR. Mem. Bost. Soc. I, 1869, 544 (alp. reg. of Mt. Popocatepetl).—SCL. and SALV. Nom. Neotr. 1873, 4 (Mexico).—BOUC. Cat. Av. 1876, 149 (Mexico).—SALV. and GODM., Biol. Centr. Am. I, pt. 6, 1879, 47 (part).—SEEBOHM, Cat. B. Brit. Mus., V, 1881, 331 (highlands of Mexico).

GEOGRAPHICAL RANGE.—Highest mountains of southern Mexico, (Orizaba, Popocatepetl, etc.) in summer, descending to the tableland in winter.

Adult male in breeding season (135,701, Cofre de Perote, Vera Cruz, Mexico, May 30, 1893; E. W. Nelson): Above uniform rich smalt-blue, darker (hyacinth blue) anteriorly; shafts of remiges and rectrices deep black, and tips of the former, especially on inner webs, dull blackish

¹"*SIALIA mexicana* SW. Size of *S. arctica*; upper plumage bright purple-blue, chin and throat the same; across the breast a rufous band, which color is continued on the sides and flanks; middle of the body, vent, and under tail covers light blue, inclining to white. Total length 6 1-2, wings 4 1-2, tarsi 3-4, tail 3 inches. Inhabits Mexico. In Mr. Taylor's collection."

²These localities, according to Prof. Sumichrast (l. c.), are probably incorrect.

slate. Chin, throat, and upper part of chest dull smalt-blue (decidedly, but not abruptly, paler and duller than top and sides of head); sides of chest, sides, and flanks chestnut-cinnamon, inclining to mars brown, this color extending rather narrowly across the upper breast, where, however, somewhat streaked with blue along the median line; lower median portion of breast, upper part of belly, axillars, and under wing-coverts, light, grayish smalt-blue, inclining to campanula-blue; the under tail-coverts similar but still paler, with basal portion and edges of feathers grayish white; lower belly and anal region dull grayish white. Bill and feet black. Total length (skin), 6.20; wing, 4.62; tail, 2.88¹; exposed culmen, 0.50; tarsus, 0.85; middle toe, 0.62.

Adult male in autumn (No. 135,709, Villar, San Luis Potosi, Mexico, Sept. 28, 1892; E. W. Nelson): Above purplish cobalt-blue, the back and scapulars overlaid or obscured by grayish brown wash occupying, broadly, the tips of the feathers; top of head similarly but more faintly obscured by brownish gray. Otherwise similar to the breeding plumage, as described above, but blue of under parts much paler (intermediate between 'campanula' blue and 'flax-flower' blue), except on axillars, under wing-coverts, and under tail-coverts, which are campanula blue, the latter with whitish margins. Cinnamon-chestnut of breast extending continuously across. Total length (skin), 6.65; wing, 4.35; tail, 2.73; tarsus, 0.82; middle toe, 0.60.

Adult female in breeding season (No. 135,705, Mt. Orizaba, Puebla, April 19, 1893; E. W. Nelson): Above dull grayish blue, becoming bright blue (intermediate between 'campanula' and 'cobalt') on rump, upper tail-coverts and tail, dullest on the back, where inclining to drab-brown on scapular region, especially anterior portion; outermost primary with outer web broadly margined with pure white, and outer web of exterior tail-feather almost wholly pure white. Chin, throat, and malar region dull light bluish gray, the chin and upper throat very indistinctly mottled with darker; entire chest (except upper median portion, where mixed with gray of throat), upper breast, sides, and flanks, uniform rufous-cinnamon, deepest on sides of chest; median portion of lower breast light dull gray, fading to dull whitish gray on belly and anal region; under tail-coverts light grayish blue, broadly margined with white. Bill and feet black. Total length (skin), 6.20; wing, 4.30; tail, 2.70; exposed culmen, 0.43; tarsus, 0.82; middle toe, 0.60.

Adult female in winter (No. 135,711, Mt. Popocatepetl, Mexico, February 24, 1893; E. W. Nelson): Very similar to the specimen (in breeding plumage) described above, but back and scapulars uniformly warm brown ('Prout's' brown), and cinnamon-color of breast, etc., deeper as well as much more extensive (covering entire chest and breast, as well

¹ Extreme and average measurements of wing and tail of 7 adult males are as follows: Wing: Average, 4.38; longest, 4.62; shortest, 4.18. Tail: Average, 2.69; longest, 2.88; shortest, 2.50.

as whole of sides and flanks). Total length (skin), 6.25; wing, 4.25; tail, 2.60¹; exposed culmen, 0.40; tarsus, 0.82; middle toe, 0.58.

The six adult males of this form before me vary remarkably in coloration. The one in breeding plumage described above was selected as agreeing more closely with Swainson's original description than any of the others. Like Swainson's 'type,' this is absolutely without a trace of brown on the back or scapulars, and the uniform blue of the upper parts is of the same rich, dark purplish hue.

An adult male in similar condition of plumage collected on Mt. Orizaba, Puebla, April 19, by Mr. Nelson (No. 135,703, collector's number 1040), is in general appearance similar, but has a distinct patch of chestnut-brown on each side of the back (on outermost anterior scapulars), has the blue of the throat and lower breast paler and duller, and the cinnamon-chestnut of the breast much more extensive and absolutely unbroken in the median portion.

Another specimen from the same locality collected April 21 (No. 135,704) has these features still more pronounced, the chestnut of the back extending quite across on the anterior portion, and the whole breast, as well as the chest, being uniform cinnamon-chestnut, though not quite so deep in color nor so extensive as in the February specimen from Mt. Popocatepetl, mentioned below.

An adult male in perfect plumage from Mt. Popocatepetl obtained February 24, 1893, by Mr. Nelson (No. 135,710, collector's number 849), has the upper parts exactly as in the example just mentioned, but the under parts are still more extensively cinnamon-chestnut, this color occupying not only the whole of the chest, breast, sides, and flanks, but also the lower throat. The whole throat is faintly tinged with rusty, and the color of the breast, etc., approaches far more closely to chestnut than cinnamon.

An example in fresh autumnal plumage from the foot-hills near Charcas, San Luis Potosi (No. 124,903, November 13, 1891, P. L. Jouy) is not only wholly rich deep smalt blue above, but

¹ Average and extreme measurements of wing and tail in 4 adult females are as follows: Wing: Average, 4.26; longest, 4.30; shortest, 4.22. Tail: Average, 2.64; longest, 2.70; shortest, 2.55.

the lower parts are also chiefly blue (deep 'campanula'), fading into pale bluish gray on lower belly and anal region and relieved anteriorly by a large patch of chestnut extending from the sides of the chest to the flanks, but posteriorly narrower and broken by admixture of light grayish blue.

That the type of *S. mexicana* (described from a specimen "in Mr. Taylor's collection") came from some part of the State of Puebla, or immediately contiguous territory, is rendered probable through the re-discovery near Charcas, by Mr. P. L. Jouy, of *Aphelocoma cyanotis*, the type of which (without definite locality) was also collected by Mr. Taylor.¹

Females of this form may be at once distinguished from those of *S. m. occidentalis* and *S. m. anabelæ* (which are much alike) by the far deeper, more purplish blue of the upper parts, and altogether more distinct and extended cinnamomeous color of the under parts. They are also decidedly larger, especially in length of wing.

2. *Sialia mexicana occidentalis* (TOWNSEND).

WESTERN BLUEBIRD.

Sialia occidentalis TOWNS. Jour. Ac. Nat. Sci. Philad. VII, 1837, 188 (Columbia R.).²—AUD. B. Am. II, 1841, 176, pl. 135.—NUTT. Man. 2d ed. I, 1840, 513.—HEERM. Jour. Ac. Nat. Sci. Philad. II, 1852, 264 (California).—WOODH. Sitgreave's Rep. 1853, 68.—HENRY, Proc. Ac. Nat. Sci. Philad. VII, 1855, 310 (New Mexico).—NEWB. P. R. R. Rep. VI, 1857, 80.—SEEBOHM, Cat. B. Brit. Mus. V, 1881, 332 (Pacific Coast U. S. to Rocky Mts., n. to Brit. Columb., s. to Colorado basin).

Sylvia occidentalis AUD. Biog. V, 1839, 41, pl. 393.

¹ Cf. Proc. U. S. Nat. Mus., —, —, —.

² "Description. Colour bright blue; shoulders and lower part of breast, chestnut-rufous; chin and upper part of the breast, azure; belly and vent faintly tinged with blue.

"Female and young, grayish, faintly tinged with blue, becoming brighter on the rump, wings and tail; beneath, pale rufous and gray. The bill is longer than that of the common native [*i. e.*, eastern] species, which it strongly resembles in many respects.

"Inhabits the plains of the Columbia River." (TOWNSEND, l. c.)

Townsend's types (adult male and female) are in the National Museum collection.

Sialia cæruleocollis VIG. Zool. Voy. Blossom, 1839, 18, pl. 3 (California?).¹

Sialia mexicana (nec SWAINSON.) GAMB. Proc. Ac. Nat. Sci. Philad. III, 1846, 113 (California); Jour. Ac. Nat. Sci. Phil. I, 1847, 37 (do.).—SCL. P. Z. S. 1857, 126 (California); 1859, 235 (Vancouver I.).—BAIRD, B. N. Am. 1858, 223; Cat. N. Am. B. 1859, No. 159; Review, 1864, 63.—COOP. Orn. Cal. I, 1870, 28.—COUES, Key, 1872, 76; 2d ed., 1884, 258; Check List, 1873, No. 17; 2d ed. 1882, No. 28; B. N. W. 1874, 14; B. Col. Val. 1878, 80.—B. B. & R. Hist. N. Am. B. I., 1874, 65, pl. 5, fig. 2.—LAWR. Mem. Bost. Soc. N. H. II, 1874, 267 (Mazatlan; plains of Colima²).—RIDGW. Nom. N. Am. B. 1881, No. 23; Man. 1887, 581.—ANTHONY, Zoc, IV, No. 3, 1893, 247 (San Pedro Martir Mts., Lower Cal.; common during migrations).

GEOGRAPHICAL DISTRIBUTION.—Western United States in general (in wooded districts), north to British Columbia, east to Colorado, western Texas, and New Mexico, south to San Pedro Martir Mts., Lower California, western and northern Mexico (Mazatlan, Colima, Sonora, Chihuahua and Cohahuila). Apparently breeding to nearly the southern limit of its range.³

SUBSP. CHAR.—Smaller than true *S. mexicana*, with the blue color of upper parts much lighter (ultramarine or light smalt blue instead of deep

¹ "Sial. capite, gula, collo, corporeque superiori cæruleis; dorso interscapulari brunnescenti; pectore abdominisque lateribus rufis, hoc imo albescenti.

"Longitude corporis, 6 1-4; rostri, 5-8; alæ, a carpo ad apicem remigis secundæ, 4 1-2; caudæ, 3; tarsi, 7-8.

"This species may be distinguished from the *Sylvia sialis*, Lath., which forms the type of Mr. Swainson's genus *Sialia*, by the blue color of the throat in front, and the brown color of the back. The bill is also slighter than in the latter bird. A young specimen, or perhaps a female of the species, is in the collection, which has the colours much less vivid than in the adult bird; the rufous color of the lower body seems also to extend further up the throat. It, however, evinces its distinction from the young of the allied species by the slighter bill, and by a white mark extending over the outer web of the interior quill-feathers, at their base." (VIGORS, l. c.)

No locality is mentioned, but the specimens on which the above descriptions were based were either from California or the west coast of Mexico.

² I have not seen Col. Grayson's Mazatlan specimens, but an adult male and female collected by Xantus on the plains of Colima, in October, 1863, now in the National Museum Collection, are of this form.

³ An adult female from Saltillo, Cohahuila, obtained by Lieut. Couch in May, 1853, is in worn breeding plumage. Even in the San Pedro Martir Mountains, Lower California, where it is said to be "very common during migrations from sea level to the top of the range," a few remain, according to Mr. Anthony (l. c.) "to nest with the local race."

smalt); female with cinnamomeous color of under parts paler and much less extensive.¹

a. TYPICAL FORM (true *S. m. occidentalis*).

Adult male in spring (type, No. 1930, Columbia River; J. K. Townsend): Upper parts rich cobalt blue; sides of upper back (not scapulars) chestnut, forming two somewhat wedge-shaped patches, nearly connected anteriorly, the median feathers of the upper back being tipped with chestnut; tips of remiges (broadly) brownish dusky. Sides of head and neck, chin, throat, and chest cobalt-blue, rather lighter than upper parts; sides of breast wholly chestnut, this color extending across the upper breast and posteriorly over the sides to the flanks, where considerably paler; median lower breast or upper belly light grayish blue, fading into dull white on lower belly and anal region; under tail-coverts pale grayish blue margined with grayish white, and with dusky shafts. Bill deep black; legs and feet dark brown. Total length (skin), 6.10; wing, 4.10; tail, 2.55; exposed culmen (tip of bill broken); tarsus, 0.80; middle toe, 0.60.

Adult male in autumn (No. 107,287, Humboldt Bay, California, Nov. 21, 1885; Chas. H. Townsend): Similar to the male in spring, as described above, but feathers of hinder half of head, neck, back, chin, throat, and chest indistinctly tipped with pale brownish gray, considerably obscuring the blue, which on the chin, throat, and chest is considerably paler than on the upper parts; feathers of chestnut patch on breast tipped with paler; remiges and rectrices with narrow terminal margins of whitish. The blue is of a much more purplish hue than in the type, and the chestnut color on the sides of the back is more restricted, but these are individual, not seasonal, differences. Total length (skin), 6.00; wing, 4.05; tail, 2.48; exposed culmen, 0.43; tarsus, 0.75; middle toe, 0.55.

Adult female in spring (No. 82,590, Marin Co., California, April 15, 1878; C. A. Allen): Top of head and hind-neck mouse-gray, faintly tinged with light blue, especially on hind-neck; back and scapulars hair-brown, becoming paler and grayer, and tinged with light blue, posteriorly; rump, upper tail-coverts, lesser wing-coverts, and tail cerulean blue, brightest on rump; outer web of lateral tail-feather broadly edged with white; middle wing-coverts dusky, margined with grayish blue; greater coverts and tertials deep grayish brown margined with light brownish gray; primary-coverts similar, but strongly tinged with blue; outer webs of primaries light glaucous-blue, narrowly edged with whitish, the outermost one broadly and sharply edged with pure white. Sides of head grayish brown, more decidedly brown on ear-coverts, the eyes encircled

¹ Average and extreme measurements of wing and tail in a series of 82 adult males (including both true *occidentalis* and *bairdi*) are as follows: Wing: Average, 4.20; longest, 4.55; shortest, 3.90. Tail: Average, 2.63; longest, 2.80; shortest, 2.40.

by an indistinct orbital ring of dull grayish white; malar region, chin, and throat, pale grayish brown; whole breast dull light cinnamon, this color extending (more faintly) over sides but disappearing on flanks; rest of under parts similar in color to throat, passing into dull whitish on lower belly and anal region; lower tail-coverts grayish blue centrally, with blackish shaft-streaks, and broadly margined with grayish white. Bill and feet brownish black. Total length (skin), 6.10; wing, 3.95; tail, 2.45; exposed culmen, 0.45; tarsus, 0.82; middle toe, 0.60.

Adult female in autumn (No. 2,949, Columbia River; J. K. Townsend): Similar to the spring plumage, as described above, but colors more suffused, the blue less bright, top of head and hind-neck more strongly tinged with blue, whitish orbital ring much more distinct, the breast and sides deeper cinnamon-brown. Total length (skin), 6.50; wing, 3.97; tail, 2.42; exposed culmen, 0.45; tarsus, 0.85; middle toe, 0.63.

b. CHESTNUT-BACKED FORM (*S. m. bairdi*).

*Adult male in spring*¹ (type of *S. m. bairdi* Ridgw., No. 7637, Camp 110, "New Mexico," Jan. 31, 1854; Kennerly and Möllhausen): Head and neck all round, chest, and upper parts except back and scapulars, rich ultramarine-blue, with a tinge of smalt-blue, rather paler on chin, throat, and chest; entire back, including most of the scapulars, uniform chestnut, forming a 'solid' shield-shaped patch, abruptly defined anteriorly against the blue of the hind-neck; upper tail-coverts with indistinct blackish median streaks; ends of remiges abruptly blackish dusky, with very narrow but distinct terminal margins; shafts of remiges and rectrices glossy black. Entire breast (except lower median portion), sides, and flanks, uniform chestnut, of a rather lighter more rusty shade than that on the back; lower median portion of breast and upper part of abdomen, bright grayish blue, like throat and chest; rest of belly light bluish gray becoming whitish about the anal region; under tail-coverts light campanula-blue, margined with white. Bill and feet black. Total length (skin), 6.60 (6.25 before skinning); wing, 4.35; tail, 2.75; exposed culmen, 0.45; tarsus, 0.80; middle toe, 0.52.

Adult male in autumn (No. 68,442, Black River, Arizona, Oct. 7, 1874; H. W. Henshaw): Similar to the spring plumage, as described above, but blue of head, neck and chest obscured by brownish gray tips to the feathers (these more rusty on the chest), chestnut of back and scapulars duller and broken by paler tips to the feathers, that of the chest also varied with paler tips; blue of upper belly and median lower breast rather paler and duller. Total length (skin), 6.20; wing, 4.43; tail, 2.85; exposed culmen, 0.40; tarsus, 0.80; middle toe, 0.58.

¹ Although the date is so early the plumage is in perfect condition, without a trace of the paler, duller tips to many of the feathers which characterize the autumnal and early winter dress.

Adult female in spring (No. 41,230, Ft. Whipple, Arizona, April 29, 1865; E. Coues): Practically identical in coloration with No. 82,590, Marin Co., California (described previously), but buffy cinnamon of breast tinging chest and throat, instead of being sharply defined against the clear light drab-gray of chest. Total length (skin), 6.30 (6.60 before skinning); wing, 4.15; tail, 2.47; exposed culmen, 0.45; tarsus, 0.75; middle toe, 0.60.

Adult female in autumn (No. 69,216, Apache, Arizona, Oct. 24, 1874; H. W. Henshaw): Practically identical in coloration with No. 2949, described on page 157. Total length (skin), 5.95; wing, 4.00; tail, 2.50; exposed culmen, 0.43; tarsus, 0.75; middle toe, 0.55.

In adult males of the Coast form, the blue varies from the light azure hue of the type to a clear purplish smalt blue in No. 21,425, Ft. Crook, Cal. (October 22). Both these extremes are very unusual, however, no other examples in the entire series approaching either of them very closely. Among the remainder, the blue ranges from a hue intermediate between smalt and ultramarine to pure ultramarine.

The only specimen which, at first sight, seems to have no chestnut on the back is No. 13,281, Genoa, Nevada (June 20); but close inspection discovers traces of chestnut in the form of edgings to some of the feathers on each side of the upper back. This example also has the blue of the chest extended to the belly, completely dividing the chestnut of the breast. It is also unusually large, the wing measuring 4.35, the tail 2.80. It thus approaches in all these characters *S. m. anabellæ*, but may be at once separated by the much more slender bill. Specimens in perfect adult spring plumage (as No. 82,589, Nicasio, California (April 11) show little if any difference in intensity of color between the blue of the throat and chest and that on top of the head.

Adult males of the Rocky Mountain form average perhaps a little more purplish blue than the coast form, the extremes being cobalt and smalt-blue, the average hue being intermediate between smalt and ultramarine, but nearer the former. Several males of this form show very distinct black mesial streaks on the upper tail-coverts (*e. g.*, No. 105,258, El Paso Co., Colorado, March 30, and No. 41,227, Ft. Whipple, Arizona, April 19).

I have been unable to detect any difference between females of the two forms. There is a considerable amount of individual

variation in this sex, affecting chiefly the blue color, which varies from light cobalt or azure to very nearly a verditer hue, with a decided greenish tinge to the edges of the rectrices; the distinctness of blue tinge to color of pileum and hind-neck, and the color of the back, which is always distinctly browner than adjacent parts, and, strange to say, sometimes more distinctly brown in coast specimens than those from the interior.

3. *Sialia mexicana anabelæ* ANTHONY.

SAN PEDRO BLUEBIRD.

Sialia mexicana anabelæ ANTHONY, Proc. Cal. Ac. Sci. 2d ser. II, Oct. 1889, 79 (San Pedro Martir Mts., Lower Cal.); Zoe, IV, No. 3, 1893, 247 (in text, under *S. mexicana*).—A. O. U. COMM. Auk, Jan. 1890, 66.

GEOGRAPHICAL RANGE.—San Pedro Martir Mountains, Lower California (resident).

SUBSP. CHAR.—Differing from true *S. mexicana* in shorter wing, the tail averaging a little longer; lighter blue above; lower parts with much more blue; the chestnut color often confined to a patch on each side of the breast. Differing from *S. m. occidentalis* in longer wing and tail, larger bill, and less extent of the chestnut color, both above and below, that of upper parts never extensive, and usually nearly, often quite, wanting, that of under parts usually confined to a patch on each side of breast. *Females* to be distinguished from those of *S. m. occidentalis* only (?) by stouter bill.

Adult male in spring (type, coll. A. W. Anthony, San Pedro Martir Mts., Lower California, May 6, 1889): Upper parts entirely rich smalt-blue, inclining to ultramarine in certain lights, without even a trace of blue on back or scapulars; greater part of inner webs of tertials and tips of all the remiges (broadly) dull black; shafts of remiges and rectrices glossy black. Lower parts rich blue (intermediate between smalt and ultramarine), nearly as intense anteriorly as color of upper parts, but fading to light grayish blue on belly, which becomes lighter, scarcely bluish, gray centrally; under tail-coverts campanula-blue. A patch of chestnut on each side of breast, separated by a bright blue space about 0.80 of an inch wide. Bill, legs, and feet deep black. Total length (skin), 6.20; wing, 4.32; tail, 2.90¹; exposed culmen, 0.47; tarsus, 0.75; middle toe, 0.55.

¹ Average and extreme measurements of wing and tail of 41 adult males are as follows: Wing: Average, 4.29; longest, 4.48; shortest, 4.10.

Adult female in spring (same locality, May 1, 1889; A. W. Anthony): Top of head, hind-neck and sides of neck brownish gray distinctly glossed with lavender-blue; ear-coverts deeper brownish gray, or drab, without blue gloss; chin pale gray; throat and upper chest similar but tinged with fawn-color; breast and sides russet-cinnamon, paler on flanks; belly light smoke-gray; under tail-coverts light grayish blue, margined with white, and with narrow dusky shaft-streaks. Back and scapulars dull grayish brown, tinged with purplish cinnamon, the median portion of the back glossed with grayish blue; lesser and middle wing-coverts bright smalt-blue; greater coverts and tertials duller, more grayish, blue, margined with dull light grayish; secondaries and primary-coverts dull smalt-blue, dusky at tips, and edged with paler; primaries and rectrices campanula-blue, becoming dusky at tips, the outer web of exterior primary and tail-feathers broadly edged with white; lower back, rump, and upper tail-coverts bright campanula-blue, or light smalt-blue. Bill and feet black. Total length (skin), 6.40; wing, 4.15; tail, 2.80¹; exposed culmen, 0.45; tarsus, 0.80.

In the series of 44 adult males examined there is naturally a considerable amount of individual variation in plumage. That affecting the development of the chestnut color on back and breast may be summarized as follows:—

With no chestnut whatever on back or scapulars.	21
With the back chiefly blue.	18
With the back about equally blue and chestnut.	4
With the chestnut of the breast divided.	30
With the chestnut of the breast continuous anteriorly.	11
Not belonging strictly to either category.	2

In addition to this individual variation in the development of the chestnut there is a very slight one in the shade of the blue, which ranges from almost a 'smalt' hue to rich ultramarine; but the variation in this respect is far less than in either true *S. mexicana* or either of the northern races.

Unfortunately there are no specimens in Mr. Anthony's series representing either sex in autumn or winter plumage, all his specimens having been obtained during the breeding season.

¹ Average and extreme measurements of wing and tail in 18 adult females are as follows: Wing: Average, 4.13; longest, 4.27; shortest, 4.00. Tail: Average, 2.62; longest, 2.70; shortest, 2.45.

DESCRIPTION OF A NEW SPECIES OF PIPILO
FROM MOUNT ORIZABA, MEXICO.

BY ULYSSES O. COX.

While on Mount Orizaba, Mexico, as a member of Dr. Scovell's party during the summer of 1891 I made a small collection of birds of the region which Mr. Robert Ridgway of the U. S. National Museum has had the kindness to identify for me. Among them Mr. Ridgway finds a *Pipilo* which appears to be a new species. I have given it the specific name *orizabæ* and append here Mr. Ridgway's description and comparison with related species.

Pipilo orizabæ Cox, sp. nov.

"SP. CHAR.—Most like *P. maculatus* Sw., but no black whatever on upper parts, which are plain grayish brown; white markings of scapulars and wing feathers nearly obsolete, sides and flanks much paler in color, and size somewhat greater.

"*Adult male* (No. 132,72♂, U. S. National Museum, Mount Orizaba, Mexico, alt. 11,000 feet; Ulysses O. Cox): Above uniform dull grayish brown, slightly tinged with olive, scarcely darker on the head; outermost scapulars with marginal elongated spots of white, and lowermost middle and greater wing-coverts with more roundish terminal spots of the same; no white markings on remiges, but primaries edged with light brownish gray; tail (except middle feathers) very dark brown, the three outermost feathers with a large, abruptly defined, white spot terminating inner webs, that on the lateral feather nearly 1 inch long. Chin, throat, and chest blackish brown, gradually lightening on sides of head and grading gradually into color of crown, the throat spotted with white beneath the surface; sides, flanks, and under tail-coverts ochraceous-buff, somewhat deeper anteriorly; median lower parts white, broadest and purest anteriorly, next to blackish brown of the chest. Bill black; legs light brown, toes darker. Total length (skin), 8.30¹; wing, 3.35; tail, 3.85; exposed culmen, 0.60; tarsus, 1.17; middle toe, 0.78.

"This bird is obviously quite distinct from both *P. maculatus* and *P. macronyx*, as well as their hitherto described allies. The pure white and abruptly defined tail-spots, and entire

¹ Before skinning, 21 cm., = about 8.27 inches.

absence of green or yellow from any part of the plumage separate it at once from *P. macronyx*, *P. virescens* and *P. complexus*; the entire absence of black from the upper parts from *P. maculatus* and *P. submaculatus*, while it differs from all in having the entire top and sides of the head grayish brown, like the back, instead of black, like the chest. The general color of the upper parts is very much that of the darker examples of *P. fuscus*, but the color has, in certain lights, a very perceptible olivaceous cast."

BIRDS OF ONEIDA COUNTY, NEW YORK.

BY EGBERT BAGG.

SINCE the publication of the article by Dr. Ralph and myself in 'The Auk' for July, 1890, I have been able to add the following to our local list. These eight new records, together with *Vireo solitarius plumbeus*, recorded from the adjoining county of Madison, by Gerrit S. Miller, Jr., in the last number of this journal, make the total number of species and subspecies recorded from "Oneida County, N. Y., and its immediate vicinity" two hundred and thirty-nine.

Rissa tridactyla.—A young male of this species was killed at Constantia, Oswego Co. (on Oneida Lake), Nov. 9, 1890, by Robert J. Hughes.

Rynchops nigra.—I have lately examined a specimen of this bird in a taxidermist's shop in Utica, which was brought in in the fall of 1893 (October?) and reported to have been killed near Whitesboro. Baird, Brewer, and Ridgway say of this species: "It is never known to be driven astray by any storm, however violent."

Æstelata hasitata.—A male of this rare straggler was shot at Verona Beach, on Oneida Lake, August 28, 1893, by the Rev. G. A. Biederman, who presented it to Alex. H. Moore, a young ornithologist of Utica, who mounted and preserved it. Mr. B. reports that there were two birds together, but careful search shortly afterward failed to find the other, and it may have been some other species. Through the courtesy of Mr. Moore, who brought the bird to me for identification while in the flesh,

and who loaned it to me after it was mounted, I was able to secure accurate measurements and fairly good photographs of this bird.

The stomach was empty. The coloration was exactly as given by Dr. Coues, as quoted by Baird, Brewer, and Ridgway. The measurements were as follows: Length, 16 in.; wing, 10; tail $5\frac{1}{2}$, its graduation, $1\frac{3}{8}$; bill, $1\frac{3}{8}$, $\frac{2}{3}$ deep, $\frac{1}{2}$ wide; tube, $\frac{3}{8}$; tarsus, $1\frac{1}{2}$; middle toe and claw, $2\frac{1}{4}$.

Branta nigricans.—A fine specimen of this rare bird was killed by Mr. Augustus Dexter of Utica at Lewis Point, Madison County (on Oneida Lake), Oct. 30, 1891. The bird flew in from the lake and alighted on the sand beach, where it was attacked by Crows. These birds attracted its attention so that Mr. Dexter easily walked within range and secured the bird.

Ardetta exilis.—A good specimen of this Bittern was killed at New York Mills, by Mr. Charles C. Trembley of Utica, May 30, 1892. This bird is a very common summer resident, breeding in the marshes of the Seneca River only a short distance west of Oneida Lake (about 35 miles as the crow flies), and connected with it by water courses (the Seneca and Oneida Rivers uniting to form the Oswego), and it has therefore been a bird which we have always expected to find in our neighborhood, but this is our first record.

Tringa canutus.—A young bird was taken at Lewis Point, Oneida Lake, in Madison County, Aug. 26, 1891.

Limosa hæmastica.—A specimen was killed about a mile west of Lewis Point, Sept. 7, 1891, and another near the same place a few weeks later. The plumage of the first of these was in a transition state between that of winter and summer, and there was quite a white patch on the wing.

Dendroica cærulea.—A fine male in full plumage was taken at Clinton, May 9, 1890.

In addition to the above new records, the following are worthy of mention.

Hydrochelidon nigra surinamensis.—Given in the list on the authority of others only. One in the collection of Alex. Moore of Utica, identified by the writer, was taken at Utica in April, 1893.

Phalacrocorax carbo.—Given in the list on the authority of others only. I have had the pleasure of examining a fine specimen, killed on Oneida Lake, Oct. 13, 1890. The taxidermist who mounted it informed me that "the stomach contained a small fish and a soft-shell crab." How long was this bird from salt water?

Rallus virginianus.—Given in the list as "Not uncommon"; should be changed to "Not uncommon summer resident. Breeds," a nest and eggs having been taken in New Hartford by Chas. C. Trembley.

Gallinula galeata.—Mr. Trembley reports the taking of a specimen in New Hartford a few years ago, an additional record.

Tringa fuscicollis.—Several killed on the south shore of Oneida Lake, Nov. 3, 1891. An additional record.

Progne subis.—Given as “A not uncommon summer resident. Breeds.” Has practically disappeared; within the last few years an occasional migrant is all that has been seen.

Troglodytes aëdon.—I am happy to say that these birds, which had entirely disappeared for several years, have reappeared. I have records of several pairs breeding in this locality in 1893.

Urinator lumme.—One on exhibition at Sylvan Beach in 1891 was killed at Durhamville several years previously. An additional record.

THE GROUND CUCKOO OF ANDROS ISLAND.

BY GERRIT S. MILLER, JR.

ON APRIL 24, 1893, Mr. C. J. Maynard collected an adult female *Saurothera* at Fresh Creek, Andros Island, Bahamas. This specimen, which soon after came into my hands, differed from any skins of *Saurothera bahamensis* that I had seen, and at once raised the question whether the Andros Island bird was not distinct from that found on New Providence. Although Mr. Maynard was firmly convinced that this was the case, the amount of material then at my disposal did not warrant any separation of the forms. Recently through Mr. C. B. Cory's kindness I have examined about a dozen Bahaman Ground Cuckoos, including three additional specimens from Andros Island. This material shows that the bird inhabiting Andros Island is an insular form readily distinguishable from the New Providence bird. As the type of *Saurothera bahamensis* came from Nassau¹ the Andros species may stand as :

Saurothera andria, sp. nov.

Saurothera bahamensis NORTHROP, Auk, VIII, Jan. 1891, 74; CORY, Catalogue W. I. Birds, 1892, 142 (part).

SPEC. CHAR. Slightly smaller than *Saurothera bahamensis* Bryant; colors throughout darker; bill proportionately deeper through base.

¹ Bryant, Proc. Bost. Soc. Nat. Hist. IX, Feb. 1864, 280.

Adult: (Type, ♀, No. 5608, collection of G. S. Miller, Jr., Fresh Creek, Andros Island, Bahamas, April 24, 1893, C. J. Maynard, collector), dorsal surface, except bases of primaries and tips of lateral rectrices, olive shading toward hair brown on head, everywhere, but especially on wings and tail, glossed with chromium green; basal two-thirds of primaries strongly tinged with cinnamon; breast drab, becoming paler on throat, darker on sides and shading quickly into tawny olive on the belly, flanks, thighs and under tail-coverts; ventral surface of tail lustrous olive gray, the three outer feathers with a subterminal bar of black (about 11 mm. wide), widest on the outer web, and tipped with white (8 mm.) the middle pair unmarked and the next pair with very narrow white tips and a dusky subterminal spot in each web; bill (dry) slaty black at base, cutting edges, and greater part of mandible, primrose yellow, the latter slightly varied with slate color; claws black; tarsi and toes blackish slate.

As compared with *Saurothera bahamensis* this species is readily distinguishable by its darker colors and differently shaped bill. An adult female of the former (No. 4053, collection of G. S. Miller, Jr., Nassau, Jan. 27, 1884, C. J. Maynard) is hair brown on the back and head, fading to broccoli-brown on the neck, the feathers everywhere glossed with sage green. The breast is drab gray, becoming slightly paler on the throat, darker on the sides, and shading quickly to buff on the belly, flanks, thighs, and under tail-coverts. The axillars and linings of wings are ochraceous buff, paler on the carpus and deepening into clay color on the inner webs of most of the primaries where the colored area is less extensive than in *S. andria*.

Although there are, in both species, some slight individual variations in color, the differences shown by the two specimens just described very fairly represent the average of the specimens that I have seen.

Saurothera bahamensis Bryant (average of five specimens): wing, 156; tail, 278; tarsus 40.7; bill (from nostril), 38; depth through nostril, 12.6; ratio of depth to length, 33.82.

Saurothera andria Miller (average of four specimens): wing, 152; tail, 257; tarsus, 37.7; bill (from nostril), 37; depth through nostril, 14.5; ratio of depth to length, 39.09.

RECENT LITERATURE.

Nehrling's *Birds*.¹—The favorable opinion expressed (*Auk*, VII, Jan. 1890, p. 70) of this work upon the appearance of its first two Parts is fully justified in the event of the completion of Volume I, which reaches us in a very handsome exterior. We believed then that Mr. Nehrling had a message to deliver, and were not mistaken. From his earliest boyhood he has studied birds in their native haunts, and has taken time to tell us what they taught him. His life-histories are based chiefly upon his own observations, made during many years from Wisconsin to Florida and Texas; where original research has failed to reach, he has known how to draw upon various sources which need not be here specified. "For the purpose of studying the life of our birds I spent several years in Texas, five years in the Ozark region of southwestern Missouri, and a number of years in different parts of Illinois. I also visited the southern Alleghanias and different localities in Louisiana, Arkansas, Mississippi, Alabama, Georgia, Florida, etc. Yet this work would be incomplete should I have neglected to quote freely from the writings of our great American ornithologists of the present time." Those to whom such characterization may apply will no doubt be glad to find that anything they have written has served so excellent a purpose as Mr. Nehrling's. It would not be difficult to characterize his work in words of our own, but we will hear what the author has to say of his intent. Authors' opinions of their own performances are often as reliable as any reviewer's can be, and never more so than when a modest and entirely honest author speaks of what he set about to accomplish. "In the present work," says its author in his preface, "which is intended to fill the gap between the very expensive and the merely technical ornithological books, I aim 'to combine accuracy and reliability of biography with a minimum of technical description,' and to have the work 'illustrated in such a way that all figures are recognizable.' Although this work is written for all lovers of natural history, I specially endeavor to inspire our young people with a tender regard for the feathered minstrels of our woodlands, fields and meadows, groves and gardens."

We can congratulate Mr. Nehrling upon the entirely successful accomplishment of his designs. We should say much more in the present instance, had it not fallen to our reviewing lot to have spoken quite to

¹ Our Native Birds | —of— | Song and Beauty, | being | A Complete History of all the Songbirds, Flycatchers, Hummingbirds, Swifts, | Goatsuckers, Woodpeckers, Kingfishers, Trogons, Cuckoos | and Parrots, of North America. | — | By Henry Nehrling, | [etc.]—With thirty-six colored plates after water-color paintings | by Prof. Robert Ridgway, [etc.], | Prof. A. Goering, Leipzig, and Gustav Muetzel, Berlin. | — | Volume I. | — | Milwaukee: | George Brumder. | 1893. Large 4to or sm.^o fol., pp. i-1, 1-371, pll. col'd. i-xviii, some figg. in text; ed. le luxe, full Russia, gilt-edged, rubricated margins and title.

the point before, and we must not be guilty of plagiarizing—no, not even of auto-plagiarism. The faithful readers of 'The Auk' have been given the reference, and can easily turn to what would otherwise be said at the present juncture. We have not a word of that notice to retract or modify. Mr. Nehrling's book has taken, and will doubtless long maintain, the position he himself assigns as fitting, and no author could desire more than this. He has written to good purpose; his work should have a long, prosperous, and useful life. Nehrling will probably awake some day to find his writings ranked with those it becomes customary to call 'classic,' when their respective authors have forgotten alike the pangs and pleasures of delivery, and grown insensible to silence or applause.

As the present Volume I contains 18 plates, and 36 are promised per title, we understand it is to be followed by one more of like proportions. The present volume seems to be entirely Oscinine, and Mr. Nehrling may have to put on his thinking-cap if he is to bring the rest of the Passerines and all the Picarians into the category of "birds of song and beauty." We are not informed regarding any business aspect of the work, and its consequently necessary limitations, but Mr. Nehrling's plan seems to us capable of expansion beyond the advertised limits. All birds do not sing, but all are beautiful to one who understands them and keeps in touch with them as well as Mr. Nehrling does. We imagine that the publication should be immensely popular and that the publisher would be justified in amplifying its scope, until all our birds are brought under the one elastic category, for the like treatment at a Nehrling's hand. To cite an instance, there are the game-birds, in which a very large number of non-ornithological ornithologists are always interested. "Bobwhite" sounds well, one of the Ducks sings well enough to have been named *Anas cantans*, and *Aix sponsa* is certainly a bird of beauty. But we desist, for we are in danger of falling into that easiest and worst of reviewing sins—telling an author what he ought to do, instead of informing the public how well or ill he has done that which he designed to do.

The plates of this work are of an uneven order of merit. If we may be permitted to express an individual preference, without entering into invidious comparisons, we may say that those of the Goldcrest and Gnat-catcher please us most, and it should not be difficult to maintain that degree of excellence.

With hearty welcome, congratulations, and hopes for the speedy completion of a work which departs so widely from the average of its kind in making so near an approach to such as Audubon typifies,—E. C.

Anthony on the Birds of San Pedro Martir, Lower California.¹—This is a liberally annotated list of 121 species, based on the author's personal observations, made chiefly during the month of May, 1893. "The region embraced in the name of San Pedro Martir consists of a high plateau of

¹ Birds of San Pedro Martir, Lower California. By A. W. Anthony. Zoc, Vol. IV, 1893, pp. 228-247.

about sixty-five or seventy miles in length by twenty in width. . . . The northern end rises to a height, in one or two peaks, of 12,500 feet, estimated, and from that point the ridges and peaks drop away by degrees until at the southern end they merge into the low, barren hills, common to the peninsula at this point." A few rather important corrections are made of notes furnished by Mr. Anthony to Mr. Bryant's 'List of the Birds of Lower California,' published a few years since, due mainly, it appears, to their accidental insertion under the wrong species, as in the case of Harris's Hawk and the Red-tailed Hawk, but sometimes to misidentification, as in the case of the Horned Larks, where the form found at San Quintin is the *Otocoris alpestris pallida* instead of *O. a. rubea*. More to the northward *chrysolæma* is the race found in the breeding season. The paper forms a welcome and valuable addition to our knowledge of the distribution of the birds of Lower California, and especially of this previously little known portion of the peninsula.—J. A. A.

Short's Birds of Western New York.¹—This is a briefly annotated list of 207 species, but its exact geographical scope is not defined, "Western New York" being a somewhat indefinite term. While the list is evidently prepared with care, and its statements may doubtless be taken as trustworthy, it is not typographically pleasing, the specific names all beginning with capital letters and the Latin names being printed in the same kind of type as the general text. It is, moreover, liberally sprinkled with printer's errors. The list is certainly worthy of a better presentation. Acknowledgments are made for assistance to Frank H. Lattin, Neil F. Posson and Leslie V. Case. We note that the American Eared Grebe is given in place of Holbæll's Grebe, and the Yellow-bellied Flycatcher as a "rare summer resident and breeder." These are the only records that seem improbable, while the last may not be altogether so in some part of the region covered by the list.—J. A. A.

Ridgway on the Genus *Myiarchus*.²—The genus is divided into four "sections" or subgenera, two of which are new. These are (1) *Myiarchus* Cab., including the greater part of the species usually referred to the genus *Myiarchus*; (2) *Onychopterus* Reich., including *M. tuberculifer* (D'Orb.), *M. lawrencii* (Gir.), and *M. barbirostris* (Sw.); (3) *Eribates* Ridgw., type *Myiobius magnirostris* Gray; (4) *Deltarhynchus* Ridgw., type *M. flammulatus* Lawr. Mr. Ridgway regards *M. yucatanensis* as a typical member of the restricted *Myiarchus*, differing from the *M. lawrencii* and *M. l. olivascens* in its "approximately cylindrical" instead of "distinctly depressed" bill, larger size and rather lighter coloration.—J. A. A.

¹ Birds of | Western New York, | with Notes. | By | Ernest H. Short. | Chili, N. Y. | August 1st, 1893. 8vo. pp. 13.

² Remarks on the Avian Genus *Myiarchus*, with special reference to *M. yucatanensis* Lawr. By Robert Ridgway. Proc. U. S. Nat. Mus., XVI, 1893, pp. 605-608.

Ridgway on a Small Collection of Costa Rican Birds.¹—The collection consists of 10 species of little-known birds, which are here further described from specimens submitted for examination by the authorities of the Costa Rica National Museum. Several of them are species recently characterized by Mr. Ridgway and Mr. Cherrie, and one is here described as new, namely "*Buthraupis cæruleigularis* Cherrie, sp. nov." The status of *Tachyphonus rubrifrons* Lawr. is considered, *Antrostomus rufo-maculatus* Ridgw. is referred to *A. saturatus* Salvin, and considerable additional material relating to a number of other species is described, particularly *Platypharis aglaie* Ridgw. and *Scytalopus argentifrons* Ridgw.—J. A. A.

Ridgway on a Collection of Birds from Alaska.²—This is a briefly annotated list of 35 species, collected by Mr. C. H. Townsend at Kodiak, the Shumagins, and other points along the Alaskan coast, principally in August, 1888. The notes give simply the localities and dates of the specimens collected, with in addition a description of the first plumage of the Western Winter Wren (*Troglodytes hiemalis pacificus*).—J. A. A.

Ridgway on a New Storm Petrel.³—The Storm Petrel heretofore known as *Oceanodroma melania* (Bon.) is here renamed *Oceanodroma townsendi*, as "a series of nine finely prepared skins of this species, collected by Mr. C. H. Townsend off Guaymas and Acapulco, Mexico, proves," says Mr. Ridgway, "that this bird cannot be the *Thalassidroma melania* of Bonaparte, neither the dimensions nor the coloration agreeing at all closely with the latter." The habitat is given as "off coast of Mexico, north to Cape St. Lucas and Guaymas." The specimen (No. 13,025) selected as type was taken at Cape St. Lucas many years since by Mr. J. Xantus. The date of capture of none of the specimens is here given.—J. A. A.

Ridgway on the Genus *Formicarius*.⁴—This revision of the difficult and little-known genus *Formicarius* is based on a "series of nearly sixty specimens," which serves to make quite clear a number of doubtful

¹ On a small Collection of Birds from Costa Rica. By Robert Ridgway. Proc. U. S. Nat. Mus., XVI, 1893, pp. 609-614.

² Catalogue of a Collection of Birds made in Alaska by Mr. C. H. Townsend during the Cruise of the U. S. Fish Commission Steamer *Albatross*, in the Summer and Autumn of 1888. By Robert Ridgway. Proc. U. S. Nat. Mus., XVI, 1893, pp. 663-665.

³ Description of a New Storm Petrel from the Coast of Western Mexico. By Robert Ridgway. Proc. U. S. Nat. Mus., XVI, 1893, pp. 687, 688.

⁴ A Revision of the genus *Formicarius* Boddaert. By Robert Ridgway. Proc. U. S. Nat. Mus. XVI, 1893, pp. 667-686.

points, but, says Mr. Ridgway, "the material is still far from adequate for a satisfactory treatment of the subject, immense areas of South America and considerable portions of Central America being absolutely unrepresented." One of the results is the discovery that "three very distinct forms of the *analís* section of the genus occur in Costa Rica," and that the form usually referred to *F. analis* is really not that species at all, but *F. nigricapillus* Cherrie, MS., here for the first time described. Of the 12 species recognized by Mr. Ridgway 10 were represented in the material under examination. The provisional name *Formicarius nigrifrons glaucopectus* is proposed for "three Guiana birds" which appear to differ from true *nigrifrons* of the Upper Amazon. The probable intergradation of a number of the forms here treated as species is intimated.—J. A. A.

Stejneger on Japanese Birds.¹—Of the forty odd species here commented upon eight are given as new to the avifauna of Japan, and five are described as new to science. The latter are *Æstrelata longirostris*, *Columba taczanowskii*, *Accipiter pallens*, *Locustella honoensis* and *Emberiza ciopsis ijimæ*. In commenting on *Oceanodroma markhami* (Salv.) Dr. Stejneger refers incidentally to *O. melania* (Bon.), considering that "the two Mexican birds, the type and the [Cape St. Lucas] specimen in the National Museum" as "true *O. melania*." But Mr. Ridgway (see above, p. 169) has since made the Cape St. Lucas bird (No. 13,025, U. S. Nat. Mus.) the type of his recently described *Oceanodroma townsendii*. (Cf. Ridgway, Proc. U. S. Nat. Mus. XVI, 1893, p. 687.)

Dr. Stejneger has also an important note on *Æstrelata brevipes* (Peale), in which he claims that *Æ. brevipes* is not a synonym of *Æ. leucoptera* (Gould), as commonly supposed; on the other hand, *Procellaria torquata* Macgillivray (1860) he finds to be a synonym of *Procellaria brevipes* Peale (1848). He also finds that the bird previously recorded by him as *Æ. leucoptera* (Proc. U. S. Nat. Mus. XIV, 1891, p. 490) is the *Æ. hypoleuca* Salv., as shown by recent examination of authentic material. There are also a couple of pages of critical observations on *Yungipicus kizuki* and *Y. k. seebohmi*, and much criticisms of Mr. Seebohm's views on the nomenclature and relationships of Japanese birds.—J. A. A.

Richmond's Notes on Nicaraguan Birds.²—So many lists of tropical birds are based on the collections of natives or travellers having little or no knowledge of ornithology, and are therefore accompanied only by

¹ Notes on a Third Instalment of Japanese Birds in the Science College Museum, Tokoyo, Japan, with Descriptions of New Species. By Leonhard Stejneger. Proc. U. S. Nat. Mus. XVI, 1893, pp. 615-638.

² On a Collection of Birds from Eastern Nicaragua and Rio Frio, Costa Rica, with Notes; and a Description of a Supposed new Trogon. By Charles W. Richmond. Proc. U. S. Nat. Mus., XVI, 1893, pp. 479-532.

technical remarks, that Mr. Richmond's well-annotated paper is doubly welcome. His collections and observations were made between Feb. 1, 1892, and Jan. 19, 1893, all but three months of this time being passed in Nicaragua on the Escondido River, fifty miles from Bluefields.

The results of a study of his specimens, in connection with the collections of the United States National Museum, as set forth in this paper, are as follows: *Trogon chrysomelas*, a form allied to *Trogon atricollis tenellus*, is described as new; *Eleopicus* Bp. is substituted for *Dendrobates Swains.*, 1831, preoccupied by *Dendrobates* Wagler, 1830 (Batrachia). A series of 17 specimens of *Porzana cinereiceps* Lawr. apparently shows that *Porzana leucogaster* Ridgw. is founded on individual variation in that species. No reason is given for relegating the Tinamous to their ancient position between the Quails and Plovers, while *Tanagra palmarum* is presumably a slip for *Tanagra palmarum melanoptera*.

The results of Mr. Richmond's studies of living birds are too numerous to be mentioned within the limits of a brief review. His list includes 242 species of land-birds, and 39 species of water-birds. Concerning the habits of many of these he makes numerous interesting and valuable observations. He considerably extends the range of several species, *e. g.*, *Progne subis hesperia*, *Myrmelastes lawrencii*, and *Panyptila cayennensis*; gives the dates of arrival of many species of North American migrants, and makes some suggestive remarks on the movements of tropical birds. Being present during the breeding season he had an opportunity to study the nesting habits of some species, and he remarks (p. 482) "it is interesting to note that in the tropics many species lay but two eggs," a statement supported by his experience with *Merula grayi*, *Rhamphocelus passerini*, *Oryzoborus furnereus*, *Embernagra striaticeps*, *Glyphorhynchus cuneatus*, and other species.

The biographical notes are evidently based on the careful observations of a skilled observer, and the paper is therefore an important contribution to our limited knowledge of the life-histories of tropical birds.—F. M. C.

Ogilvie-Grant's 'Catalogue of the Game Birds.'¹—In Volume XXII of the British Museum Catalogue of Birds Mr. Ogilvie-Grant gives us a most welcome contribution to the history of the Game Birds of the World. As here treated they constitute four 'orders', namely, (1) the Pterocletes or 'Pigeon-Grouse,' more commonly known as Sand-Grouse, comprising 3 genera and 17 species; (2) the Gallinæ, divided into two suborders, the first, Alectoropodes, including all of the true gallinaceous birds, and the

¹ Catalogue of the Game Birds (Pterocletes, Gallinæ, Opisthocomi, Hemipodii) in the Collection of the British Museum. By W. R. Ogilvie-Grant. London: Printed by order of the Trustees. Sold by Longmans & Co., 39 Paternoster Row; B. Quaritch, 15 Piccadilly; Dulau & Co., 37 Soho Square, W.; Kegan Paul & Co., Paternoster House, Charing Cross Road; and at the British Museum (Natural History), Cromwell Road, S. W. 1893. = Catalogue of the Birds in the British Museum, Volume XXII. 8vo., pp. xvi + 585, pl. viii.

second, *Peristeropodes*, consisting of the Megapodes, the Curassows, and Guans; (3) *Opisthocomi*, with the Hoatzin as its sole representative; (4) the *Hemipodii*, composed of the Bush-Quails or Hemipods. The number of species recognized is 426, besides 25 additional subspecies, the true Gallinaceous Birds alone (that is, excluding the 125 Megapodes) numbering about 360 species. These last are referred to the two families *Tetraonidæ* and *Phasianidæ*, the former with 11 genera and 26 species, the latter with 59 genera and about 260 species. Says Mr. Grant, "There appears to be no real line of demarcation between the true Pheasants (*Phasianidæ*) and the Partridges (*Perdiciinæ*), the two groups merging gradually into one another in such forms as *Bambusicola*, *Ptilopachys*, and *Galloperdix*." Resort is made to the shape of the wing, and especially the length of the first primary as compared with the tenth, but even this usually "well-marked character breaks down, and in order to artificially separate these two groups it is necessary to have recourse to secondary or supplementary characters, such as the length of the tail."

The present volume compares favorably with the preceding volumes of the series, and is of course executed after the same general plan, the use of the trinomial form of nomenclature being excluded, and also specific names published prior to Linnæus's 12th edition. The treatment of various North American forms is amusing rather than irritating, though it seems about time to expect a more intelligent conception of the subject of subspecies and "climatic variation" than is shown in the present volume. In some instances forms that American writers regard as merely subspecies, and sometimes rather poor ones at that, are given the rank of full species, while in other cases they are reduced to synonyms, or allowed to stand as subspecies, as the author's comparatively limited material and lack of information as to the physiographic relations of localities seem to indicate. The author's standpoint and line of reasoning can be made clear to American readers by the following quotation from his footnote (p. 87) under *Bonasa umbellus*: "This species is subject to great climatic variation. . . . The various varieties have been catalogued under no less than four different names, either as species or subspecies, by the latest American authors; but as all these varieties are to be found among a series of specimens from New York alone and are, therefore, not even dependent on locality, we consider it needless to employ more than one name for all, especially as the four recognized forms grade imperceptibly into one another."

We are surprised to find the term *Ortyx* used for our Bob-whites in place of *Colinus*, and without a word of comment, after it has been so clearly shown by Dr. Stejneger (Auk, II, Jan. 1885, p. 44) that *Ortyx* was employed by Oken in 1816 for the genus *Turnix*, and also by Illiger, in a slightly different form, in the same sense as early as 1811. *Ortyx* is, therefore, clearly a synonym of *Turnix*, and is untenable as used by Stephens in 1819, leaving *Colinus* as the proper name of the genus for which Mr. Grant still retains the name *Ortyx*.—J. A. A.

Elliot's Monograph of the Pittidæ.—Part II of Mr. Elliot's 'Monograph of the Pittidæ' (see antea, p. 62, for notice of Part I), dated December, 1893, contains illustrations of the following species: *Eucichla ellioti*, *Pitta cærulea* (two plates, giving adult male and female and young), *Anthocincla phayeri*, *Pitta rufiventris*, *P. coronata*, *P. iris*, *P. ussheri*, *P. megarhyncha*, and *P. cucullata*. Very little appears to be known of the life-histories of these beautiful birds. In the few species where the nesting habits are known they appear to construct a domed nest on the ground and lay white eggs, heavily marked and streaked with dark colors.—J. A. A.

Chapman on the Birds of the Island of Trinidad.¹—In this article Mr. Chapman has favored us with another of his excellent papers which so attractively combine entertaining popular description with scientific information. The first five pages are devoted to a general description of the Island of Trinidad and the separate localities where collections were made. A dissertation on the faunal position of Trinidad follows, succeeded by a bibliography of the Trinidad Avifauna. 'Additions to the Trinidad Avifauna' and 'Species described as new and Changes in Nomenclature' are the subjects immediately following, while 'General Remarks on Trinidad Bird-Life' include most interesting matter under the separate headings of 'Number of Species,' 'Migrations,' 'Call-Notes and Song,' 'Nesting,' and 'The Colors of Tropical Birds.' A list of all the species known to the author as having been taken in Trinidad completes the paper. This list, which is freely annotated, mentions 306 species, the last 3 of which, given on Léotaud's authority, Mr. Chapman is unable to identify. The list is rendered more valuable by mention of the local names, both English and French (the latter from Léotaud), and citation of equivalent names in both Léotaud's and Taylor's catalogues.

In the list of species I notice the omission of *Formicarius trinitatis* and *F. albicrissus*, described by me in the Proceedings of the U. S. National Museum, Vol. XIV, No. 871, p. 481. Whether any others have been overlooked I have not had time to ascertain.—R. R.

Publications Received.—Andersen, Knud. *Ligurinus sinicus* i Danmark. (Vidensk. Meddel. Foren. Kbhvn. 1893.)

Büttikofer, J. (1) Description of a New Genus of Crakes. (Notes from the Leyden Mus. XV, pp. 274, 275.) (2) Ornithologisches Sammlungen aus Celebes, Saleyer und Flores. (Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indian, III, pp. 269-306, pll. xvii, xviii.)

Chapman, Frank M. On the Birds of the Island of Trinidad. (Bull. Am. Mus. Nat. Hist. VI, pp. 1-86, Feb., 1894.)

Cherrie, Geo. K. Exploraciones Zoológicas efectuadas en la parte meridional de Costa Rica, por los annos de 1891-92. I. Aves. 12mo. pp. 59.

¹ On the Birds of the Island of Trinidad. By Frank M. Chapman. Bull. Am. Mus. Nat. Hist., Vol. VI, Art. I, pp. 1-86. (February 16, 1894.)

Clark, Hubert Lyman. The Pterylography of the Pileated Woodpecker. (Science, No. 565, Dec. 1, 1893.)

Clarke, Wm. Eagle. The Persecution of the Great Skua—*Stercorarius catarrhactes*. (Ann. Scottish Nat. Hist., Jan., 1894.)

Elliot, Daniel G. The Life and Services of John James Audubon, an Address delivered before the New York Academy of Sciences, April 26, 1893. (Trans. N. Y. Acad. Sci. XIII, pp. 43-57.)

Lawrence, George N. On the Validity of *Chrysotis canifrons*. (Ibis, Oct., 1893.)

Meyer, A. B. Beschreibung einiger neuen Vögel aus dem Ostindischen Archipel. (Journ. für Orn. 1894, pp. 89-93.)

Ogilvie-Grant, W. R. (1) A Short Review of the Francolins belonging to the Genera *Francolinus* and *Pternistes*. (Ibis, 1892, pp. 32-55, pl. i.) (2) On the Gallinaceous Genera *Bambusicola* and *Arboricola*. (Ibis, 1892, pp. 387-399, pl. ix.) (3) Notes on the Genus *Coturnix*. (Ann. and Mag. Nat. Hist., August, 1892, pp. 166-173.) (4) Notes on Changes of Plumage in the Red Grouse (*Lagopus scoticus*). (Ibid., July, 1893, pp. 61-65.)

Ridgway, Robert. Description of a New *Geothlypis* from Brownsville, Texas. (Proc. U. S. Nat. Mus. XVI, pp. 691, 692.)

Shalow, Herman. Beiträge zur Oologie der recenten Ratiten. (Journ. für Orn. Jan. 1894, pp. 1-28.)

Shufeldt, R. W. (1) On the Taxonomy of the Swifts and Humming-birds: A Rejoinder. (Ibis, Jan., 1894, pp. 32-39.) (2) Night Hawks and Whip-poor-wills. (Pop. Sci. Monthly, Jan., 1894, pp. 308-313.) (3) On the Coloration of the Ruffed Grouse. (Science, No. 573, Jan. 26, 1894, p. 48.) (4) Note on the Shoulder-Girdle of the Man-o'-War Bird. (Ibid., p. 50.)

Actes de la Société scientifique de Chili, III. livr. 1, 2, Oct., 1893.

American Journ. Sci., Jan.-March, 1894.

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Annals of Scottish Natural History, Jan., 1894.

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Ornithologische Jahrbuch, IV, Heft. 6 and V, Heft. 1.

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Ornithologist and Oölogist, XVIII, Nos. 8-10, Aug.-Oct., 1893.

Ottawa Naturalist, VII, Nos. 10-12, Jan.-March, 1894.

Transactions Wisconsin Acad. Sci., Arts and Letters, IX, Pt. 2, 1893.

Zoölogist, Jan.-March, 1894.

GENERAL NOTES.

An Abundance of Murres in the Environs of Quebec.—Since the 15th of November last, numerous flocks of Murres¹ have been seen flying over the river before Quebec; hundreds have been shot by sportsmen and some have even been killed with sticks near the wharves. The cold in December has been from 15° to 25° Reaumur, but it did not seem to inconvenience them. Several, however, that had left the water to rest on floating ice found themselves unable to remove on account of their wet feet freezing to it; two live specimens thus captured have been brought to me. The presence of these birds is a novelty here, as they are never met with in the environs of the city. Several have even strayed away into the mountains about ten miles from the river; they were exhausted and starving. After the 20th of December their numbers considerably decreased till the 8th of January, when the last were seen. Their presence is probably due to hurricanes in the Gulf of St. Lawrence driving them towards the southwest.—C. E. DIONNE, *Quebec, Can.*

The Double-crested Cormorant.—I have read with interest an article on the 'Habits of the Double-crested Cormorant' in 'The Auk' for January, 1894. For the last ten years I have spent one day in the last part of September on the Graves at the entrance to Boston Harbor, the resort for the Cormorants of the north shore. I try to get there on a rising tide, believing that the Cormorants which I drive away fly to an outlying ledge of the Brewsters and there sit on the seaweed until driven off by the tide, when they fly back to the high rocks of the Graves. I generally take two decoys which I put on the top of the rocks and hide myself in a cleft. I generally shoot four or five and try and justify my doing so by giving them to an old inhabitant of Swampscott, in his day a sportsman, who puts them through that process of dissolution which is said to make Coot palatable (but which doesn't), and eats them. I have often seen the balls of fish bones lying on the rocks described by Mr. Mackay, rejections after digestion by the Cormorant, and have, as he says, invariably found the throat of the bird full of fish, generally the common sea perch.—CHARLES P. CURTIS, JR., *Boston, Mass.*

Correction.—In my article 'Habits of the Double-crested Cormorant in Rhode Island' (*Auk*, Jan. 1894, p. 20) "*Cancer irroratus* Say = *Panopeus sayi* Smith" should read "*Cancer irroratus* Say and *Panopeus sayi* Smith."—GEO. M. MACKAY, *Nantucket, Mass.*

In Re Dutcher on the Labrador Duck.—Fearing that my statement in the January 'Auk,' p. 11, lines 1 and 2,—“D. M. Cole and his associate, Mr. Cary, saw a female duck with a brood of young which he was sure was this species,”—may give a wrong impression, notwithstanding the conclusion stated at the close of the paragraph, I now state that the bird

¹ [A specimen sent to Dr. Jonathan Dwight, Jr., proved to be *Uria lomvia*.—EDD.]

seen was *not* a Labrador Duck. Mr. Cole has recently visited Cambridge, and through the courtesy of Mr. William Brewster was shown his specimens of the Labrador as well as other specimens of Ducks, and after a careful study of them, aided by Mr. Brewster, concludes that the bird he saw on the Grand River was a female of the genus *Glaucionetta*,—Golden-eye.—WILLIAM DUTCHER, *New York City*.

The Labrador Duck.—An Overlooked Specimen and Record.—Mr. Ernest D. Wintle, of Montreal, Canada, lately called my attention to a heretofore overlooked record and specimen of the Labrador Duck. The following is an exact copy of the record as published in 'The Canadian Naturalist and Geologist,' Vol. VII, December, 1862, No. 6, pp. 426-427, by Archibald Hall, M. D., L. R. C. S. E, in his series of papers entitled 'On the Mammals and Birds of the District of Montreal.'

"*A. Labradorica*. Labrador Duck.

"*Fuligula Labradorica*. Anderson!

"*Camptolæmus Labradorus*. Gmel.! Gray! Baird!

"v. s. p. Cire flesh colour; remainder of bill blackish horn colour; tarsi and irides yellow.

"Dorsal aspect. With the exception of a streak of black stretching from the base of the bill to the occiput, and a very light brown streaky stain stretching from the cere to below the ear, all the rest of the head, with the secondaries, pure white; remainder of the back black; tail, which is rather acuminate rounded, blackish brown; the distal third of the outer edge of the outer scapulars coloured with black, and the whole of the inner vanes of the inner half dusky, terminating in blackish, giving to the under surface of the wing a dusky appearance; the primaries are all dusky black; the feathers on the cheek have a bristly feel; in other parts of the head and neck the feathers have a velvety feel, a good deal resembling that of the Great Northern Diver.

"Ventral aspect. A belt of white across the breast until it touches the wing, and separated from the white of the head by a ring of black about half an inch broad; remainder of breast black, quickly changing to blackish, which itself changes to brown on the abdomen and under wing coverts; the flanks, like the lower part of the breast, are shining black.

"Length, from tip of bill to apex of tail, $20\frac{1}{2}$ inches; alar expanse, $27\frac{1}{2}$ inches; the two first primaries longest and subequal.

"A specimen of this beautiful duck, the first which I have seen, was shot in the bay of Laprairie this spring (1862) by a *habitant*, and was purchased by Mr. Thompson of this city, who has kindly placed it at my disposal for examination. I believe it to be one of the rarest of our visitants of this species, and to demonstrate that an acquaintance with our Fauna must be a work of many years."

This specimen is the forty-second so far known, of which thirty are in North America. It gives me pleasure to announce that by purchase I have added this specimen to my collection.—WILLIAM DUTCHER, *New York City*.

The Yellow-crowned Night Heron in Rhode Island.—In August, 1892, it was my good fortune to procure a Yellow-crowned Night Heron (*Nycticorax violaceus*), at Newport, Rhode Island. The bird was a young female, and was taken in a small grove of pine trees. When first perceived it was standing on the ground apparently unconcerned as to its surroundings. Upon my approach the bird did not appear intimidated but began to walk along slowly under the trees. It was very easily shot. This is the first one of this species that I have seen in Newport, and I think it rather a rare occurrence.—J. LIVERMORE, *New York City*.

High Plumage in the Ptarmigan.—Early in January, I received a box of Grouse in the flesh from Mr. Thomas J. Egan of Halifax, N. S., among which were a pair of Ptarmigan (*Lagopus lagopus*) from Newfoundland. One of these, a male, had the shafts of the secondaries black and was therefore probably *L. alleni*, but the most striking thing about the plumage was the very evident tinge of rose-color, which was deepest on the rump and on the sides under the wings. The bird was examined in daylight and there was no mistaking its very high coloration. It was equally clear that the color was not adventitious or due to any external influence. The shading was so delicate that I felt sure it would fade from a skin and so the specimen was not preserved. My attention has again been called to the matter, however, by another male *L. lagopus*, which I have recently received from Mr. William Clark of Winnipeg, to whom I am indebted for other birds also. This specimen was larger than the first and the rosy tint was more intense being especially clear on the sides, making the bird by far the handsomest one of its species which I have ever seen. Possibly this high plumage may have been recorded by others but it is not mentioned by the authorities to whom I have access.—HUBERT LYMAN CLARK, *Pittsburgh, Pa.*

Capture of *Ceryle torquata* (Linn.) at Laredo, Texas. A Species New to the United States.—Mr. George B. Benners of Philadelphia recently brought to me for identification a Kingfisher which he had secured near Laredo, Texas, and which proved to be an adult female of the Ringed Kingfisher, *Ceryle torquata*, which, so far as I am aware, has not been previously recorded farther north than southern Mexico.

Mr. Benners states that he shot the bird on June 2, 1888, about one mile below Laredo on the United States side of the Rio Grande. It was sitting on some old roots which had been washed up into a heap by the current of the river, and was shot immediately, so that he did not see it fly or hear its call. Mr. Benners further states that he never saw one of these birds in the vicinity either before or since. Upon the strength of the evidence just given this species seems entitled to a place in the fauna of the United States, along with the several other tropical birds which occasionally reach the Rio Grande valley.

Mr. Benners has generously presented the specimen to the Academy of Natural Sciences of Philadelphia (No. 30,517, Coll. A. N. S. Phila.).—WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

Dryobates scalaris lucasanus in San Diego County, California.—A Sapsucker collected by Mr. W. W. Price on April 29, 1889, at White Water, San Diego County, Cal., is a typical example of *Dryobates scalaris lucasanus*. Mr. Price writes me that the specimen (♂ ad., No. 5,324, collection of G. S. Miller, Jr.) was shot from a telegraph pole "about three miles west of the station of White Water." Woodpeckers, apparently of the same kind, were seen on several other occasions on the telegraph poles along the line of the S. P. R. R. near White Water, but they were very shy and no more could be killed. The birds were nesting in the telegraph poles, there being no other wood in the region.

Mr. A. W. Anthony found this bird among the San Pedro Martir Mountains, Lower California, in April, 1893 (*Zoe*, IV, October, 1893, p. 236). The present record extends the range of the form considerably to the northward.—GERRIT S. MILLER, JR., *Cambridge, Mass.*

Notes on the Capture of the Gray Kingbird (*Tyrannus dominicensis*) near Charleston, South Carolina.—In the early part of May, 1885, Mr. Brewster and myself saw a pair of Gray Kingbirds at Fort Moultrie, Sullivan's Island, S. C. I determined to secure these birds with their nest and eggs, and after several visits to the Island I located their range, and on May 28, I found their nest which contained one egg and shot the female bird. The nest was built in a silver-leaf poplar, in a gentleman's yard, only a few feet from his dwelling house. The nest, as I remember it, was very frail. Since that date of capture I have failed to notice the presence of this species on any of the coast islands of South Carolina, until this year, 1893.

On May 30 of this year, I determined to search Sullivan's Island carefully for this rare visitor, and accordingly I arrived there early in the morning of the above date. After walking the entire length of the Island near the front beach, and having failed to discover this species, I leisurely searched the back beach. At twelve o'clock—mid-day—a bird I saw flying about three hundred yards away I took to be this species. I followed the direction of its flight until it was lost to view—over half a mile away. I at once hastened to the spot, and to my delight found a veritable Gray Kingbird perched on the top of a flag pole about fifty feet high in a private yard. The law on the Island prohibits shooting, under penalty of \$10.00 fine. My only chance was for the bird to light on the Government property—Fort Moultrie grounds—six yards away, where I could not be molested. I did not have long to wait before the male which was perched on the flag pole flew into the Government lands where I at once shot it. Upon my shooting the bird its mate flew directly over me, and I soon had it stored carefully away in my collecting basket. The nest which was found in the private yard, close to the flag pole, was built in the top of a small live oak tree about twenty feet high. It is a very frail structure, and is composed of sticks, jessamine vines, and lined apparently with oleander rootlets. One article in its composition which

is quite curious is a long piece of fishing cord. The nest contained two eggs, and upon dissecting the female I found one more egg which would have been laid the following day. It will be seen that all the specimens of the Gray Kingbird which have been actually taken in South Carolina were from this famous Island—a favorite summer resort for the people of Charleston.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Picicorvus an Untenable Genus.—In 'History of North American Birds,' Vol. II, p. 255, it is stated that the so-called genus *Picicorvus* "is so similar to *Nucifraga* as to be hardly separable; the principal difference being in the slender and more decurved and attenuated bill, with a slightly concave, instead of convex, culmen, and plain instead of spotted plumage." At the time, only one of the Old World species of *Nucifraga*, *N. caryocatactes*, the type of the genus, was available for comparison, and such was still the case when the A. O. U. Check-List was prepared; but more recently other species have been secured by the National Museum, and these, notably *N. multiguttata* Gould, from the Himalayas, show that the supposed distinction as to shape of the bill exists only as a specific character, *N. multipunctata* having the bill quite as slender as that of "*Picicorvus*" *columbianus*. Furthermore, the American species frequently shows indications of white apical spots to feathers of the breast, and still better developed white spots at tips of primaries. I can therefore see no good reason for continuing the recognition of *Picicorvus* as a genus, and would follow Audubon in calling Clarke's Nutcracker *Nucifraga columbiana*.—ROBERT RIDGWAY, *U. S. National Museum, Washington, D. C.*

Notes on the Distribution of the Bobolink in South Carolina.—Mr. Loomis in his article entitled 'A Further Review of the Avian Fauna of Chester County, South Carolina,' in 'The Auk' for January, 1894, p. 27, makes this statement: "This is exemplified in the Bobolink, which is abundant along the South Carolina coast in autumn, but only so in the interior of the State in spring." This latter clause is entirely incorrect. The Bobolink is very abundant along the coast from April 28 to May 26, and some remain until June 5. They are known as 'May Birds,' and play havoc with the rice which has just sprouted by pulling it up. The rice fields have to be watched from morning till night by men called 'bird minders' who are shooting the entire day. A great many planters now plant the 'late' rice in June to avoid the birds. The May Birds do not confine themselves entirely to the rice, but also resort to the oat fields which at that season are 'in the milk,' and they become excessively fat. I have killed frequently more than forty Bobolinks at a shot from the oat fields in May. The Bobolink is also very partial to the enormous potato fields which are in full bloom the last of May and nearly ready to be dug. I have never been able to find what they feed on in the potato fields but it must be some bug peculiar to the potato. It is safe to say that millions of Bobolinks depredate upon the rice planters every May.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Change from Winter to Spring Plumage in the Male Bobolink (*Dolichonyx oryzivorus*).—I have been much interested in Mr. Chapman's articles on the "spring moult" of the Bobolink (Auk, VII, 1893, p. 120; and X, 1893, p. 311), but after reading them I could not help asking myself two questions: Does the adult male Bobolink always have a spring moult except when caged? If so, how can we explain the fact that *in captivity the same change in plumage may take place absolutely without any sign of moulting?*

As I must leave these questions unanswered, let me add a few words about a pet Bobolink I once owned.

The bird was in the usual black breeding plumage when I first had him, but *during the fall there was a complete moult*, and he became the well known Reed-bird of the South. Always having had the impression that the Bobolink must also moult when changing from the winter to the summer dress, I was very much surprised in this case to find no feathers in the cage at any time during the spring, though I looked carefully for them myself day after day. The change in color, however, went steadily on, beginning with the appearance of a black feather here and there, until, having passed through a kind of intermediate 'pie-bald' stage, my bird looked once more as he did when I first had him the previous summer; except that the black was not quite as deep, though very nearly so, nor was the yellowish white so clear as at first. All at once, before the change was complete, he burst into full song, and kept it up until fall, when he moulted, and was again the yellowish brown bird of the preceding autumn.

There was no doubt about the autumnal change being a *true moult* during this or the preceding fall, as the feathers about the cage and the 'pin-feathers' on the bird fully proved, and the absence of any true moult in spring was shown with equal certainty by the absence of these same proofs.

In the autumn I gave my Bobolink to a friend, who only succeeded in keeping him a few weeks; so this was the last of one of the happiest birds it was ever my good fortune to possess.—JAMES SKILLEN, *Harvard Medical School, Boston, Mass.*

Calcarius lapponicus in Winter at Palmer, Marquette Co., Mich.—On January 22, 1894, I obtained a male Lapland Longspur. When secured it was feeding on grass seed and oats left by some horses, which had been fed at the south and protected side of a building at the mine. The day was cold and stormy, as had been the day previous. The bird had doubtless been lured north by the preceding week of warm weather, January 14-21. It was alone, no others being seen at the time; nor have I the knowledge of another authentic record of its occurrence in Upper Peninsula, although I have made many inquiries.—OSCAR B. WARREN, *Palmer, Mich.*

Missouri Titlark in Louisiana.—A number of Missouri Titlarks (*Anthus spragueii*) were shot on January 20, 1894, at Avery's Island, Iberia Parish, Louisiana. One of the specimens is in my possession. I hardly think the bird has yet been recorded from Eastern Louisiana. Iberia Parish is at the eastern edge of the Louisiana prairies.—GUSTAVE KOHN, *New Orleans, La.*

The Western Winter Wren in Southern California.—On Wilson's Peak, November 24, 1893, I shot a Western Winter Wren (*Troglodytes hiemalis pacificus*). Its sharp *chip*, coming from a thick growth of bushes at the bottom of a small ravine, revealed its presence. On November 17, there was a heavy gale from the northward, and several inches of snow fell on the peak. November 23 some large patches of snow still lay on the summit, and also below it, on the northern side, some 450 feet or so, where the solitary Wren was found. In Belding's 'Land Birds of the Pacific District' this species is recorded as having been taken both at Fort Tejon, 65 miles northwest of here, and at Saticoy, near Ventura. No other Wrens were noted on the peak during our short stay, but at the base of the range a single *Thryothorus*, probably Vigors's Wren, was seen in the evening dusting itself in the sand under a species of white sage.—R. H. LAWRENCE, *Monrovia, Cal.*

Notes on Some Connecticut Birds.—*Melospiza lincolni*.—This shy Sparrow was not uncommon here from September 21 to October 3, 1893. Eight of these birds were secured by Mr. W. E. Treat.

Sylvania pusilla.—The Wilson's Warbler is so seldom seen during the fall migration that the capture of two specimens here, September 27, 1893, by Mr. Treat, may be worthy of record.

Vireo philadelphicus.—A male of this rare species was taken here September 21, 1893, and is in my cabinet. It was killed among some large willows on an island in the Connecticut River.—JNO. H. SAGE, *Portland, Conn.*

Rare Visitants to the Connecticut River Valley in 1893.—*Rynchops nigra*.—During the prevalence of an unusually severe gale the latter part of August, a Black Skimmer was found in West Springfield, Mass., in an exhausted condition, and taken by hand.

Dendroica palmarum.—On the 4th of September, in Windsor, Conn., Leon Holcomb of Springfield captured a young Palm Warbler. He found it feeding on the ground in an old field, in company with American Goldfinches.

Crymophilus fulcarius.—Near Chicopee, Mass., on the 30th of September, two young Red Phalaropes were captured from a flock of about a dozen.—ROBERT O. MORRIS, *Springfield, Mass.*

Some Summer Birds of the Pocono Mountains, Pennsylvania.—During the past summer I spent a few days—July 2-4, 1893—collecting in the immediate vicinity of Mt. Pocono, Monroe Co., Pennsylvania, and observed the following 'northern' species, all of which were undoubtedly breeding at that locality. The notes which accompany each species are based either upon my own experience or upon that of my friend, Mr. William A. Shryock, who accompanied me and made a more extended stay in the vicinity.

Carpodacus purpureus.—Several seen.

Dendroica pensylvanica.—Common in the clearings and second growth. A young bird in the first plumage was secured.

Dendroica cærulescens.—Tolerably common in oak and hemlock woods bordering a deep ravine.

Sylvania canadensis.—Common in the rhododendron thickets. Mr. Shryock secured a nest and set of eggs.

Turdus aonalaschkæ pallasii.—One specimen secured. The elevation and location of the Pocono plateau is such as to warrant a fauna quite as boreal as that found at Harveys Lake and North Mt.,¹ but the virgin forest has been entirely cleared away in the vicinity of Mt. Pocono and with it have disappeared the northern species of birds, a few only remaining in the deep ravines where they still find a congenial home in the rhododendron thickets, and the scant growth of hemlocks which escaped the lumberman's axe.

That the fauna of the Poconos was once quite as rich in boreal forms as the northern Alleghanies is shown by the fact that a few miles beyond Tolyhanna Mills (northwest of Mt. Pocono), where there still remains a portion of the virgin hemlock forest, my friend, Mr. Stewardson Brown, found (July 24, 1893) the Junco and Winter Wren in addition to the species above mentioned. Mr. Brown also observed a large flock of Red Crossbills at Tolyhanna, and in a clearing near the hemlock tract, he is positive he heard several White-throated Sparrows singing. As Mr. Brown is thoroughly acquainted with this bird he could hardly have been mistaken, but it is unfortunate that he was unable to secure a specimen, as this is, so far as I am aware, the first record of the occurrence of this species in Pennsylvania in the breeding season.—WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

Ten New Birds for Colorado.—During the past few weeks I have had the pleasure of examining several small collections of stuffed birds that had been taken in Colorado and find among them several species that have never been formally ascribed to the State.

Larus philadelphia. BONAPARTE'S GULL.—One at Denver and one at Colorado Springs. There is a slight doubt about the one at Denver having been captured in Colorado.

¹ See Stone, Proc. Acad. Nat. Sci. Phila., 1891, p. 431, and Dwight, Auk, 1892, p. 129.

Sterna antillarum. LEAST TERN.—One at Colorado Springs; reported as having been taken near Fort Collins.

Mergus serrator. RED-BREASTED MERGANSER.—Has been but once before reported from Colorado, namely, by Lieut. P. M. Thorne from Fort Lyon. It has, however, been also taken at Fort Collins, and December 1, 1893, I obtained it on a small lake near Berthoud.

Oidemia deglandi. WHITE-WINGED SCOTER.—It seems queer that this ocean Duck should occur in this arid region, but not only is there one stuffed at Fort Collins, but some four or five other occurrences have come to my knowledge.

Botaurus exilis. LEAST BITTERN.—A single specimen known, taken near Colorado Springs.

Ardea candidissima. SNOWY HERON.—A white Heron has been twice attributed to Colorado, but both times with a question as to the species really seen. It is probable that this is the kind observed, for several have been taken in the State. I have seen two specimens, one taken at Loveland and the other at Fort Collins.

Nycticorax nycticorax nævius. BLACK-CROWNED NIGHT HERON.—A specimen at Colorado Springs adds a second to the single occurrence already reported by Mr. H. G. Smith at Denver.

Grus canadensis. LITTLE BROWN CRANE.—In addition to the one reported by Lieut. Thorne at Fort Lyon, a specimen has been taken near Fort Collins.

Calidris arenaria. SANDERLING.—One taken near Fort Collins; one other specimen has also been reported.

Charadrius squatarola. BLACK-BELLIED PLOVER.—The only printed record of this bird to date is that of Mr. Smith from Denver. There is a stuffed specimen at Fort Collins, and I shot one out of a flock of four at the same place October 28, 1893.

Nyctala acadica. SAW-WHET OWL.—One of these birds was found dead near my house, January 12, 1894. There is also a mounted specimen at the College here, and it has been reported to me from other places in the State. I have also two more records of the Short-eared Owl, which has been but twice before reported from the State.

Nyctea nyctea. SNOWY OWL.—It seems strange that no record of this Owl should have crept into print, for it is a not uncommon winter visitant. Nearly a dozen cases of its occurrence have been reported to me and I have seen one mounted bird taken near Fort Collins.

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO.—Has probably been taken in the State several times, but I can find no printed record of it. There is a mounted specimen at Fort Collins.

Zonotrichia querula. HARRIS'S SPARROW.—One at Colorado Springs.

Dendroica cærulescens. BLACK-THROATED BLUE WARBLER.—One at Colorado Springs.—W. W. COOKE, *Fort Collins, Colo.*

CORRESPONDENCE.

[Correspondents are requested to write briefly and to the point. No attention will be paid to anonymous communications.]

Frank Bolles.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs:—At a regular meeting of the Nuttall Ornithological Club held February 19, 1894, the following Memorial of Mr. Frank Bolles, an Associate Member of the A. O. U., who died January 10, 1894, was adopted by the Club for entrance in the Records and the secretary was instructed to communicate it to 'The Auk' for publication.

This Memorial was written by Mr. Hoffmann for the special committee appointed to prepare it, consisting of Messrs. Brewster, Batchelder, Carruth and Hoffman.

Yours very truly,

FRANCIS BEACH WHITE,

Secretary.

Nuttall Ornithological Club, Cambridge, Mass., Feb. 21, 1894.

Mr. Bolles's connection with the Nuttall Club, which has been so sadly and unexpectedly severed, dated from December, 1887, when he was elected to membership. Throughout the next six years his interest in the success of the Club was keen, and his attendance, when the nature of his work is considered, extremely constant. He used the opportunity which his connection with Harvard University afforded him to add to the membership of the Club, and his contributions in the shape of papers were of unflinching interest.

Through the spring of 1892 he served the Club faithfully in the capacity of secretary. His presence at any meeting was a stimulus to both readers and listeners and a guarantee of fruitful discussion of the questions in hand.

Of the papers which Mr. Bolles has read at various meetings of the Club, some have found their way into his books, while others have appeared in various periodicals. His published works include beside his two books—'The Land of the Lingering Snow' and 'At the North of Bearcamp Water'—and some scattered notes, an article in the 'New England Magazine' (Vol. VII, p. 93) called 'Bird Traits'; one in the 'Popular Science Monthly' (Vol. XLI, p. 313) called 'Ways of the Owl'; and three in 'The Auk,' entitled 'Barred Owls in Captivity' (Vol. VII, p. 101), 'Yellow-bellied Woodpeckers and their Uninvited Guests' (Vol. VIII, p. 256) and 'Young Sapsuckers in Captivity' (Vol. IX, p. 109).

His services to Ornithology were of two distinct kinds; several of his articles dealing with special subjects, took rank as soon as they appeared, as contributions of permanent scientific value. This is especially true of his well-known study of the Sapsuckers, an examination of which will reveal the secret of much of his success in field-work. It gives abundant evidence of the most patient and intelligent observation. When Mr. Bolles undertook the study of any particular problem, he concentrated his attention upon the subject with a remarkable conscientiousness and closeness. Nothing was allowed to distract him from the work in hand; nothing escaped him which might throw light on it. He displayed, moreover, a fertility and an ingenuity in experiment which enabled him to test in a remarkable way the accuracy of his conclusions.

Besides these special contributions to scientific knowledge, Mr. Bolles in his popular writings presented the subject of Ornithology in so attractive a light, and to so large an audience, that it is doubtful if any other recent writer has awakened a more widespread interest in the subject.

The story of his entrance into the field of literature is an interesting one. In the winter of 1889, before the 'Boston Post' had ceased to represent the best traditions of Boston journalism, its readers were attracted by a series of weekly letters, signed O. W. L., which described, in a vivid and attractive fashion, the changes of a New England season from mid-winter to early spring. The letters showed the fields and hills of the vicinity in an aspect totally unfamiliar to many and lent to the seemingly barren wastes of snow, the animation of natural life, and the warmth and beauty of sunset and storm. They were often written at the close of a long outing, rapidly and accurately setting forth in the incisive language which Mr. Bolles always employed, the incidents of the day. At the fortunate suggestion of Mr. Lowell the letters were put into a permanent form and will serve to perpetuate to an ever-increasing number of readers the memory of their author.

It will be evident to the hastiest reader of Mr. Bolles's books, as it was to those who knew him, that he loved the outdoor world with the intensity and entire sincerity of his whole nature. Especially the wilder aspects of Nature appealed to him. Winter, the sea, the mountains, attracted him, and found in him a sympathetic interpreter. In his unaffected delight in being out of doors, and in his enthusiasm in recording the simplest facts that came within his observation lie much of the charm of his work. There is, besides, the virility and freshness of his style, and his splendid power of description.

Of Mr. Bolles as a man and as a friend this is not the place to speak at length. To those who knew him, his presence is still so vivid, and the feeling of his loss so keen, that a mere word will serve to recall him. His whole-heartedness characterized his relations with his fellows, as it entered into everything he undertook. All who knew him feel a sense of his loss which reveals to them how large a part he filled in their lives.

Random Notes on some of the Parasites of Birds.

TO THE EDITORS OF 'THE AUK':—

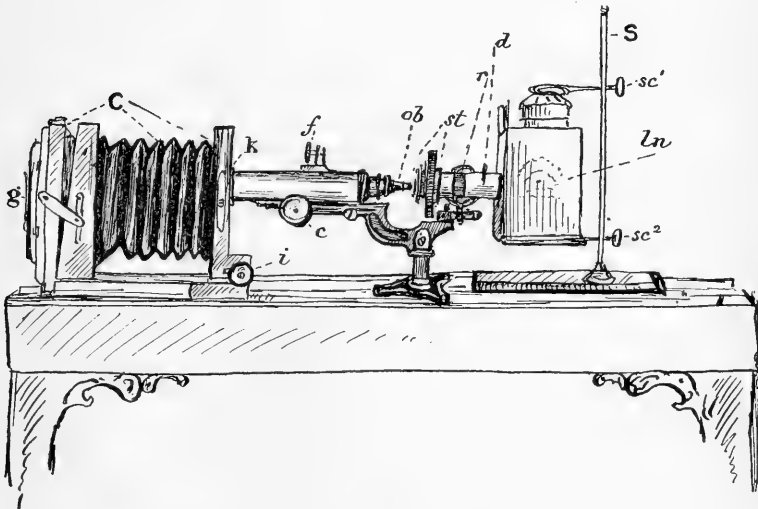
Dear Sirs:—Five or six years ago when collecting in New Mexico, I shot one afternoon some eighteen or twenty White-throated Swifts (*Aëronautes melanoleucus*), which I carried home as usual in newspaper cones in my pockets. On my way back I discovered an enormous parasite crawling along the edge of the collar of my shooting-jacket. At first it struck me that it must be some large 'pine-louse' which had fallen on me while passing through the timber earlier in the day. But as I walked along the idea came into my mind that perhaps the Swifts had something to do with it, and I at once seated myself on the prairie and took out all my specimens. Some half a dozen of them had been carefully examined before anything turned up to confirm my suspicions, when, sure enough, I came to one which had crawling among its feathers an insect apparently the very counterpart of the one I had captured on my coat. Both of these were consigned to a small bottle in my collecting-case, but a thorough going over of all the rest of my birds did not reward me with another of those interesting parasites. A few days later I sent these specimens to the distinguished entomologist Mr. Charles O. Waterhouse, of the British Museum, and he found them worthy of a notice and a figure of the insect in the 'Proceedings' of the Zoölogical Society of London for 1887 (pp. 163, 164). Mr. Waterhouse found this parasitic dipterous insect to belong to the family Hippoboscidæ, and to be new to science. He called it *Anapera fimbriata*, and remarked: "It is closely allied to *Anapera pallida*, a European dipterous parasite found on *Cypselus apus*. It is, however, much larger, and is at once distinguished by the almost total absence of wings—a character which might, by some, be considered of generic importance. Having only two examples, which appear to be females, I prefer for the present to place the species in the genus *Anapera*."

My attention had never been especially drawn to this interesting subject before, nor have I since had much opportunity to look very closely into it. But it has often occurred to me, that if we were familiar with a great many of the parasites of our birds, they might in some instances prove to be of service in the classification of the birds themselves. Now in the case of those Swifts,—there we find two species, belonging, one each, to widely-separated countries. The extraordinarily large and unusual parasites found on them are also of the same genus, yet of very distinct species. It would be interesting now to know whether this parasite—*Anapera fimbriata*—is found upon any of our other species of Swifts, or whether they have different kinds infesting them. None of my ornithological friends seem to have given much attention to this subject, and, beyond the writings of Leach, Nitzsch, and Burmeister, I am not especially familiar with the literature of the subject. Sly peeps into Dame Nature's secrets

are sometimes the most seductive of all the glimpses we catch of her, and a few days ago the notion entered my head to do a little prying,—but only in the direction that has just been indicated.

Every one of us who have collected birds have often noticed that if the specimens are set aside for a few hours, and the bodies become cold, numerous little parasites which have infested them during life now crawl out upon the ends of the feathers or bristles around the base of the mandibles. Here they will often remain until they starve to death and fall off, or disappear in other ways. Hundreds of times I have looked at them with a high-power hand-lens with great interest, but never made any sketches of them, as I had at that time devised no means to do so with accuracy. Later, I was again attracted to the subject, but owned no micro-photographing instrument of any kind. But a day or so ago I determined to overcome this most serious difficulty and improvise a micro-photographing apparatus, of some form or other, and in the venture I succeeded far beyond my most sanguine expectations.

This is the way I did it, and my sketch of the affair as finally set up is given below and will help my readers to comprehend my remarks about it. These I will give in some little detail as I hope to have others inves-



DR. SHUFELDT'S IMPROVED APPARATUS FOR MAKING MICRO-PHOTOGRAPHS OF THE PARASITES OF BIRDS.

C, Camera-box; *g*, ground-glass; *k*, the card-board front where the body of the microscope enters the camera; *i*, focussing screw of camera-bed; *f*, fine adjustment screw of microscope, and *c*, the coarse adjustment; *ob*, objective; *st*, stage and substage; *v*, rubber-band holding the lens of lantern and substage condenser together; *d*, diaphragm in lantern lens; *s*, standard for lantern; *ln*, dark-room lantern of photographic outfit; *sc*¹, *sc*², screws to standard, by means of which the lantern can be lowered or raised.

tigate and describe some of these parasites of our birds. Most naturalists nowadays own a camera and outfit, and also a microscope and its outfit. This is my case. In the first place then I took my largest camera and placed it on a long table as shown in the sketch. I removed its lens and lens-board, and fitted a cardboard front to take its place at K. Next I took my largest microscope, — a Beck's Monocular National — and brought it into the horizontal position. I fitted the upper end of its body, while in this position, into the cardboard front of the camera (K). A substage condenser, and a $\frac{3}{4}$ inch objective were next attached to the microscope, and the camera and the latter coupled together. Now most micro-photographers omit using the eye-piece of the microscope, but with it I subsequently obtained the best results. It is inserted *after* the barrel or body of the microscope is run through the cardboard into the front part of the camera-box.

For an *illuminator* I used the dark-lantern of my photographic outfit, — simply withdrawing the ruby-glass slide in front, and fitting in its place a thick piece of cardboard, into the centre of which I inserted the lens from a small camera to act as a 'bull's-eye condenser.' This is coupled with the substage condenser on the microscope by means of a broad rubber band, shown at *r*. My lantern I held nicely in the proper position by suspending it between the 'rings' of a chemical standard, as shown in my sketch; but any simple device will hold your lantern up in its proper place. It can even be 'built up' by putting *books* under it. Both the lantern and microscope rest upon a very thin board which travels with ease on the extension-bed of the camera-box. By this latter simple contrivance, focussing your specimen on the ground-glass of the camera is easily managed. The screws at *f*, *c*, and *i* control the whole thing, and the rest can be with ease understood from my sketch of the plan adopted.

Yesterday afternoon (Feb. 27, 1894) I shot a specimen of *Junco hyemalis*, and immediately after getting it, searched through its feathers for parasites but could find none after fifteen minutes' hard-looking. In the throat-feathers, however, I found some minute, ellipsoidal egg-sacs, — four or five in one place, and two in another. They were about one-tenth of a millimetre long, and were attached to the calami of the semi-plumuleous feathers so characteristic of most of the plumage of *Junco*. In most cases there was but one sac attached to a feather, at the side of its short calamus, but in two cases there were two sacs, placed exactly side by side. They were in an advanced stage of development and their structure could be easily studied with a high-power (one-fifth inch objective), without staining.

In a few hours my Junco was cold and rigid, and two parasites were found upon his chin-feathers. They measured but a small fraction of a millimetre, and were of the same species, — apparently ♂ and ♀. One was rather larger than the other and darker. I got them both on a minute feather, and between two microscopic 'glass-slides,' and on to the stage of the microscope. As soon as the light was turned on they were

thrown up on to the ground-glass of my camera at *g*, as big as two small crabs! They could be focussed *sharp*, and studied with the greatest ease, — and of course there would be no difficulty in obtaining a first-rate photograph of them. It was most remarkable to see them get round through the barbules of the feathers, or at times suck the blood from an unopened 'pin-feather.' Some of their antics were very curious. This species has a large triangular head; six legs, terminating in hooked claws for climbing among the feathers of the bird's plumage. They also hold on with their mandibles, which are situated near the centre of the ventral aspect of the head. Antennæ are lateral, and the whole insect is sparsely, very sparsely, covered with little spine-like hairs. I studied them for two hours with great interest and profit, and towards the last quite forgot the fact that the *real insect* was so small! as to be scarcely observable by the naked eye. On the ground-glass of the camera they were between three and four inches long.

I believe this to have been the only pair of the kind on the bird, but in a few hours another species appeared on the feathers of the throat of my Junco, — about a dozen or more of them. These were *white*, barely discernible to the naked eye, and very active. They were entirely different in form from the first pair secured, and at the present writing I have not studied them very closely.

This is all I have to say about this subject just at present, but in conclusion let me add that I would be glad to have the titles of any works devoted especially to these forms of parasites as they have been described for birds in general, and for United States birds in particular. It would seem that a special memoir devoted to full descriptions of this class of insects, and illustrated by micro-photographs of the various species, would, apart from its value to the entomologist, prove of interest to the avian taxonomer.

Very respectfully,

R. W. SHUFELDT.

Takoma, D. C., Feb. 27, 1894.

NOTES AND NEWS.

THE REV. SAMUEL LOCKWOOD, Ph.D., an Associate Member of the A. O. U., died at Frehold, N. J., Jan. 9, 1894, at the age of 75 years. Dr. Lockwood was born in Nottinghamshire, England, and came to America in childhood. He was graduated from the University of the City of New York in 1847, and from the New Brunswick (N. J.) Theological Seminary in 1850. He was for many years a clergyman at Keyport, N. J., and later became superintendent of the public schools of Monmouth County, New Jersey. He took an earnest interest in all matters relating to education,

and was an enthusiastic observer of nature, and a frequent contributor to natural history journals, his contributions relating to a wide range of subjects. His articles are mostly of a popular character, but include many original observations, which give them a permanent value. His ornithological writings were not extensive. At the Ninth Congress of the A. O. U. he read a paper entitled 'Why the Mockingbirds left New Jersey—a Geological Reason,' which was published in the 'American Naturalist' for August, 1892. For many years he was President of the New Jersey Microscopical Society.

NEWS has just reached us of the death of Dr. William Cushman Avery, an Associate Member of the A. O. U., at his home in Greensboro', Alabama, on March 11, 1894. Further notice of Dr. Avery is necessarily deferred to a later number of 'The Auk.'

A NEW edition of Mr. Thomas McIlwraith's 'Birds of Ontario' is announced as in press by the Methodist Book and Publishing House of Toronto. This new edition, the publishers state, "has been carefully revised and enlarged, and will present a concise account of every species of bird known to have been found in Ontario (316 in all), with a description of their nests and eggs. Mr. McIlwraith has added to the new book instructions for collecting birds and preparing and preserving skins, also directions how to form a collection of eggs." The volume will comprise some 420 pages of letter-press, with numerous illustrations.

A NEW edition of the late Henry D. Minot's 'The Land-Birds and Game-Birds of New England, with Descriptions of the Birds, their Nests and Eggs, their Habits and Notes,' is also about to appear, under the editorship of Mr. William Brewster. Mr. Minot's book was not only a highly original work, but one of much merit and permanent value, and hence well worthy of a new lease of life.

MR. SAMUEL N. RHOADS, of Haddonfield, N. J., announces that he has discovered a perfect copy of the long lost 'Second American Edition' of 'Guthrie's Geography,' published in 1815, and containing zoölogical matter prepared by George Ord. This embraces pp. 290-361 of Vol. II, and includes "nominal lists of vertebrates, in which scientific names are originally imposed upon nearly all of the species described by Lewis and Clarke, followed by descriptions of many of them." It is thus an important work of reference, access to which has of late been impossible. Mr. Rhoads states that this was "Mr. Ord's private annotated copy," presented at his death to the Philadelphia College of Physicians. A reprint of the part on zoölogy is being prepared for publication. "As nearly as possible the reprint will be an exact reproduction of the size, paging, paragraphing, typography and mistakes of the original." Orders for the work may be addressed to Mr. Rhoads, as above.

THE COMMITTEE OF THE WORLD'S COLUMBIAN COMMISSION, having in charge the compilation of historical and educational articles, which when published are to form the history of the Exposition, has invited Dr. R. W. Shufeldt to contribute the article on 'Birds.' He will treat the subject from a historical, as well as from an educational, point of view.

THE WESTERN PENNSYLVANIA ORNITHOLOGICAL SOCIETY held its Third Meeting at the Academy of Science and Art, Pittsburgh, Pa., December 27, 1893. After the reading of the minutes of the previous meeting, several amendments to the constitution were made, and the following new members elected, viz.: Corresponding Member, Edward A. Preble, Dept. of Agriculture, Washington, D. C.; Active Members, Hon. John M. Kennedy, Rev. Charles E. St. John, Dr. W. J. Holland, and Dr. A. Petitt, Pittsburgh, Pa.; Dr. W. J. Riggs, Alleghany, Pa. The election of officers for the year 1894 resulted as follows: President, Dr. T. L. Hazzard; Vice-President, W. E. Clyde Todd; Secretary-Treasurer, H. H. Wickham. After listening to the reading of seven scientific papers, the Society adjourned to meet at the call of the Executive Committee.

THE DELAWARE VALLEY ORNITHOLOGICAL CLUB held its annual meeting at the Academy of Natural Sciences, Philadelphia, on January 4, 1894, and the following officers were elected for the ensuing year: President, George Spencer Morris; Secretary, Charles J. Rhoads; Treasurer, William L. Baily. The Club is now entering upon its fifth year and is in a flourishing condition. The membership has increased to thirty-eight, and the meetings, which are held twice a month, are largely attended. Among the more interesting communications during the past year may be mentioned 'Breeding Habits of the Night Heron,' Dr. W. E. Hughes; 'Summer Birds of the Beaverkill,' Dr. Spencer Trotter; 'A Day on the Atlantic City Marshes,' G. S. Morris; 'Study of Moulting in Birds,' Witmer Stone; 'A Collecting Trip to Southern New Jersey,' J. H. Reed; 'Extracts from Letters of Edw. Harris,' G. S. Morris; 'Ducking Trips on the Atlantic Coast,' I. N. DeHaven; and 'The Ornithology of Ord's Zoölogy,' S. N. Rhoads.

The Club has in preparation a list of the birds of southeastern Pennsylvania and southern New Jersey, which is intended to present a summary of our present knowledge of the abundance, distribution, etc., of the birds of those parts of the States mentioned which lie south of the mountains. There will be in addition a complete bibliography, a faunal map, and preliminary chapters on the physical features of the country, and on the subjects of Geographical Distribution and Migration.

WE TAKE the following respecting the eggs of the Great Auk or Gare-fowl from a recent issue of the 'London Times,' apropos of the recent sale in London of a noted egg of this celebrated bird.

"The sale yesterday afternoon [Feb. 22, 1894] of an egg of the Great Auk at Mr. Steven's auction-rooms in Covent Garden is an event of

interest to many people besides ornithologists. After a keen competition it was purchased by Sir Vauncey Crewe, of Calke Abbey, Derbyshire, for 300 guineas.

"The collecting of birds' eggs is a pastime which has obtained for some centuries. John Evelyn mentions in his diary for 1681 that when at Norwich he saw the collection of eggs formed by Sir Thomas Browne, but we must come to the end of the eighteenth century before we can trace any collector in possession of an egg of the Great Auk. Early in the present century references to collections containing specimens of this egg become more frequent. There are 68 recorded eggs of the Great Auk, but this number includes several fragmentary remains that can only by courtesy be called eggs. They may fairly be divided into four groups. Ten specimens, from their perfect condition, color, and style of marking, may be put into a class by themselves. Then we have 34 good specimens; 12 are slightly cracked, badly blown, or varnished eggs, while the remaining 14 are imperfect, varying from the eggs that had one end knocked off (probably for the purpose of sucking), like that in the Angers Museum, to the two fragments of the Natural History Museum at South Kensington. Great Britain possesses the larger number of the specimens, for, of the 68, England has 45 and Scotland 3. France comes next with 10 eggs, followed by Germany with 3. Two are in Holland, while Denmark, Portugal, and Switzerland each possess one; there are two in the United States. Again, of the 68 eggs, 29 are in 19 museums, while 21 private owners possess 39 eggs among them.

"The fact of the Great Auk having formerly inhabited the British Isles has been one great cause for the steady advance in value of its eggs. The earliest record we have of a sale by auction is in 1853, when two fetched respectively £29 and £30, which remained about their value until 1860, when one sold for £60. In 1880 the price had risen to £100, followed in 1887 by £168 and in 1888 by £225.

"The egg which was sold yesterday, though not nearly such a good specimen as that sold in 1888, has an interest to all British ornithologists from having belonged to Yarrell, who purchased it in Boulogne of a fisherman who had been in a whaling ship. He had two or three swan's eggs and this egg on a string. Yarrell asked if they were for sale, and was told that the white eggs were one franc each and the spotted one two francs. Unfortunately we do not know the date of this transaction, but it was anterior to 1838, for in that year the egg was figured in Hewitson's 'British Oology.' After Yarrell's death it was sold at Stevens's auction-rooms for £21 (December, 1856), and purchased for the late Mr. Frederick Bond, an old friend of Yarrell's. It remained in this gentleman's possession until 1875, when it was sold with his unrivalled collection of British eggs to Baron Louis d'Hamonville of Château de Mononville, who sent it to Mr. Stevens."

ERRATUM.—At bottom of Plate IV, second line, for "preesing" read "preening."



$\frac{3}{8}$

PLUMED PARTRIDGE
(*OREORTYX PICTUS PLUMIFERUS*).

MOUNTAIN PARTRIDGE
(*OREORTYX PICTUS*).

THE AUK:
A QUARTERLY JOURNAL OF
ORNITHOLOGY.

VOL. XI.

JULY, 1894.

NO. 3.

GEOGRAPHICAL, VERSUS SEXUAL, VARIATION
IN *OREORTYX PICTUS*.

BY ROBERT RIDGWAY.

Plate VI.

CERTAIN inconsistencies in the 'Catalogue of the Game Birds in the British Museum,' in the treatment of North American species, have already been referred to by Dr. Allen in his review of that important work.¹ I feel quite sure that all American ornithologists, at least, who are familiar with the geographical and other variations presented by our Grouse and Partridges will fully indorse the reviewer's observation that "it seems about time to expect a more intelligent conception of the subject of subspecies and 'climatic variation' than is shown in the present volume"; but I am sorry Dr. Allen did not give his attention to the remarks on the American Ptarmigans in the Introduction to the 'Catalogue of the Game Birds,' which might be considered "amusing" were

¹ Cf. *The Auk*, April, 1894, pp. 171, 172.

they not so utterly nonsensical and misleading. The remarks to which I refer read as follows: "I fully anticipate that I shall be blamed by some for having united all the Nearctic '*species*' of *Lagopus* described by American authors with *L. rupestris*; but I am sure that unless the practice be adopted of distinguishing every individual variation or slight climatic variety by a separate *specific* name, a careful study of these birds will lead to the same conclusion as that to which I have arrived."

The words which I have italicized in the above quotation express exactly what American ornithologists have *not* done; in fact, to do so would be as far as possible from their principles and practice. None of the subspecies of *L. rupestris* recognized in the A. O. U. Check-List are founded on individual variations, but on constant differences between specimens of corresponding seasonal and sexual plumages from distinct geographical areas. Some of these subspecies may be considered "slight climatic varieties," it is true; but their characters, however slight, are constant. These geographical forms are not recognized as "species," as Mr. Ogilvie-Grant intimates, but are distinctly ranked as subspecies—a distinction which some people seem to be unable to comprehend. Furthermore, these subspecies are, in most cases, based on a far larger series of specimens than are possessed by the British Museum.¹

To assume that American ornithologists do not recognize the vast difference between individual variations and those of a climatic or geographical character is to acknowledge inexcusable ignorance of their work or inability to understand the very simple and logical principles upon which it is based.

The subspecies selected for illustration of this article, along with its conspecific type, is perhaps the least satisfactorily differentiated of the forms which are suppressed in the 'Catalogue of the Game Birds.' The characters on which *Oreortyx pictus plumiferus* was separated from *O. pictus* proper consist in its much grayer coloration, with the whole hind-neck and upper back usually bluish gray instead of rich brown, like the back. Mr. Ogilvie-Grant, in his comments on the validity of the form (Cat. B. Brit.

¹ Of *Lagopus rupestris atkensis*, for example, the U. S. National Museum possesses 29 specimens in summer plumage (May to middle of July), and of *L. r. nelsoni*, 25 specimens of corresponding dates.

Mus., vol. xxii, p. 398, foot-note), ignoring the former character, remarks as follows:—

“Most of the males have the mantle gray, but in some specimens this colour is more or less mixed with olive-brown; on the other hand, most females have the olive-brown continued up the back of the neck to the crest, but some have the upper mantle more or less washed with gray. *I have seen no males with the olive-brown going up to the crest, and no females have the back of the neck and mantle clear gray like the breast* [italics mine]; but several specimens in intermediate plumage belong to both sexes. Ridgway, in his ‘Manual,’ p. 191, recognizes two subspecies . . . and uses these *sexual* characters to distinguish them. He makes out that the brown-necked birds (females) are confined to the Coast-region, while those with gray neck and mantle (males) inhabit the Sierra Nevada. But in a good series of specimens from Carson, Nevada¹, I find many brown-necked birds (all females) as well as gray, and from the Coast-region there is about an equal number of each.”

To show that Mr. Ogilvie-Grant entirely misunderstands my diagnosis of *O. p. plumiferus*, I quote the following from p. 191 of my ‘Manual’:—

“*a*¹. Above deep olive-brown or umber, this color *usually*² continued uninterruptedly over hind-neck to the crest; inner edges of tertials deep buff or ochraceous; forehead entirely ashy. *Hab.* Pacific coast district, from San Francisco north to Washington Territory. 292. *O. pictus* (Dougl.). **Mountain Partridge.**”

“*a*². Above grayish olive, the hind neck *usually*² partly or wholly plumbeous, like the breast; inner edges of tertials light buff or buffy whitish; forehead distinctly paler (often whitish) anteriorly. *Hab.* Sierra Nevada (both sides) from Oregon southward; southern coast district of California? Lower California? 292 *a. O. pictus plumiferus* (Gould). **Plumed Partridge.**”

¹ It would be interesting to know where these specimens are and what the author considers a “good series.” Only two specimens from Carson are mentioned in the list of specimens in the British Museum Collection.

² Not italicized in the original, but it should be noted that I was careful to indicate that the character in question was not constant!

Although confident that no mistake had been made in the diagnoses of the two forms and equally certain that the differences were not sexual, I have taken the trouble to again carefully examine all the specimens accessible to me with the view of testing the single character of the color of the hind neck—a character never claimed by me to be of more than secondary importance—and have tabulated the results, which are given below. Only specimens whose sex was determined by the collector are used, and the series was divided, previous to examination as to color of neck, into two series according to the geographical area represented. It will be seen by examination of these tables that the character is *not* sexual, and that it is, as claimed by me, to a large extent geographical. When the character in question fails as an index of locality, other characters do not; gray-naped birds from the Pacific coast being altogether more saturated in their coloration than brown-naped examples from the interior and southern coast districts.

SPECIMENS FROM NORTHERN COAST DISTRICT (NORTH OF SAN FRANCISCO BAY).

	Brown-naped.		Intermediate.		Gray-naped.	
	♂	♀	♂	♀	♂	♀
No. 2831, U. S. N. M., "Columbia River."		*				
" 84569, " " Coast Range, California.	*					
" 85169, " " "Oregon."	*					
" 97545, " " Portland ¹ , Oregon.				*		
" 126349, " " Victoria, B. C.		*				
" 129370, " " Sodaville ¹ , Oregon.			*			
" 129371, " " " "			*			
" 129372, " " " "				*		
" ———, Dept. Agric., Yaquima, " "	*					

¹ Both Portland and Sodaville are situated in the valley between the Coast Range and Cascades. These localities are, therefore, intermediate.

SPECIMENS FROM THE SIERRA NEVADA AND SOUTHERN COAST DISTRICTS.

No.	Locality	Brown-naped.		Intermediate.		Gray-naped.	
		♂	♀	♂	♀	♂	♀
10231,	U. S. N. M., Ft. Tejon, Cal.					*	
" 53662,	" Carson City, Nevada.					*	
" 53663,	" " " "					*	
" 72645,	" Mts. near Ft. Tejon, Cal.					*	*
" 72647,	" " " "					*	
" 73979,	" Calaveras Co., "			*			
" 80083,	" Walker's Basin, "					*	
" 84568,	" San Francisco, "					*	
" 84569,	" Carson City, Nevada.					*	*
" 91969,	" Baird, California.					*	
" 92480,	" Mt. Shasta, Cal.					*	
" 92482,	" " " "					*	
" 95153,	" Carson City, Nevada.					*	
" 95154,	" " " "			*			
" 100330,	" Campos, Lower California.					*	
" 105299,	" Little Bear Valley, California.					*	*
" 105300,	" " " "					*	
" 234,	Dept. Agric., Argus Range, "					*	
" 247,	" " Inyo Co., "					*	
" 265,	" " " " "					*	
" —,	" " Coso Mts., "					*	
" —,	" " Panamint Mts., "					*	
" —,	" " " " "					*	
" —,	" " " " "					*	*
" —,	" " Cajon Pass, "					*	
" —,	" " Kern Lake, "					*	
" 4058,	A. K. Fisher. San Gabriel Mts., "					*	

THE HABITS AND INDIVIDUALITIES OF THE RED-SHOULDERED HAWK (*BUTEO LINEATUS*) IN THE VICINITY OF BROOK-LINE, MASS.¹

BY FRED. H. KENNARD.

THIS paper is intended to give, so far as is possible, the results of my own personal observations of this bird and its habits,

¹ Read before the Nuttall Ornithological Club, March 19, 1894.

through a number of years. All the data and deductions therefrom are entirely my own, and necessarily limited. Therefore, if they are at all at variance with the opinions of others on the subject, such non-agreements may be excused perhaps, on account of the small area over which my observations have been made, or perhaps on account of the local individualities of the birds observed.

While I had watched several pairs of birds for a number of years, and shinned almost every tree within a radius of ten miles from Brookline that looked as though it might have a Hawk's nest in it, I had been principally conversant with squirrels' and crows' nests, owing to my lack of knowledge of the Hawk's habits; and it was not till 1884 that my real experience began, and that I began to understand the habits of the bird, as well as the proper trees to climb.

Since 1884 I can safely say I have never, but on two or three occasions, climbed to any nests that I supposed to be Hawks' nests, and not found them either inhabited or just robbed. These two or three occasions were when the old Hawks had been using some old nest for a roosting or feeding place, and had deceived me by the feathers they had left about the edge of the nest.

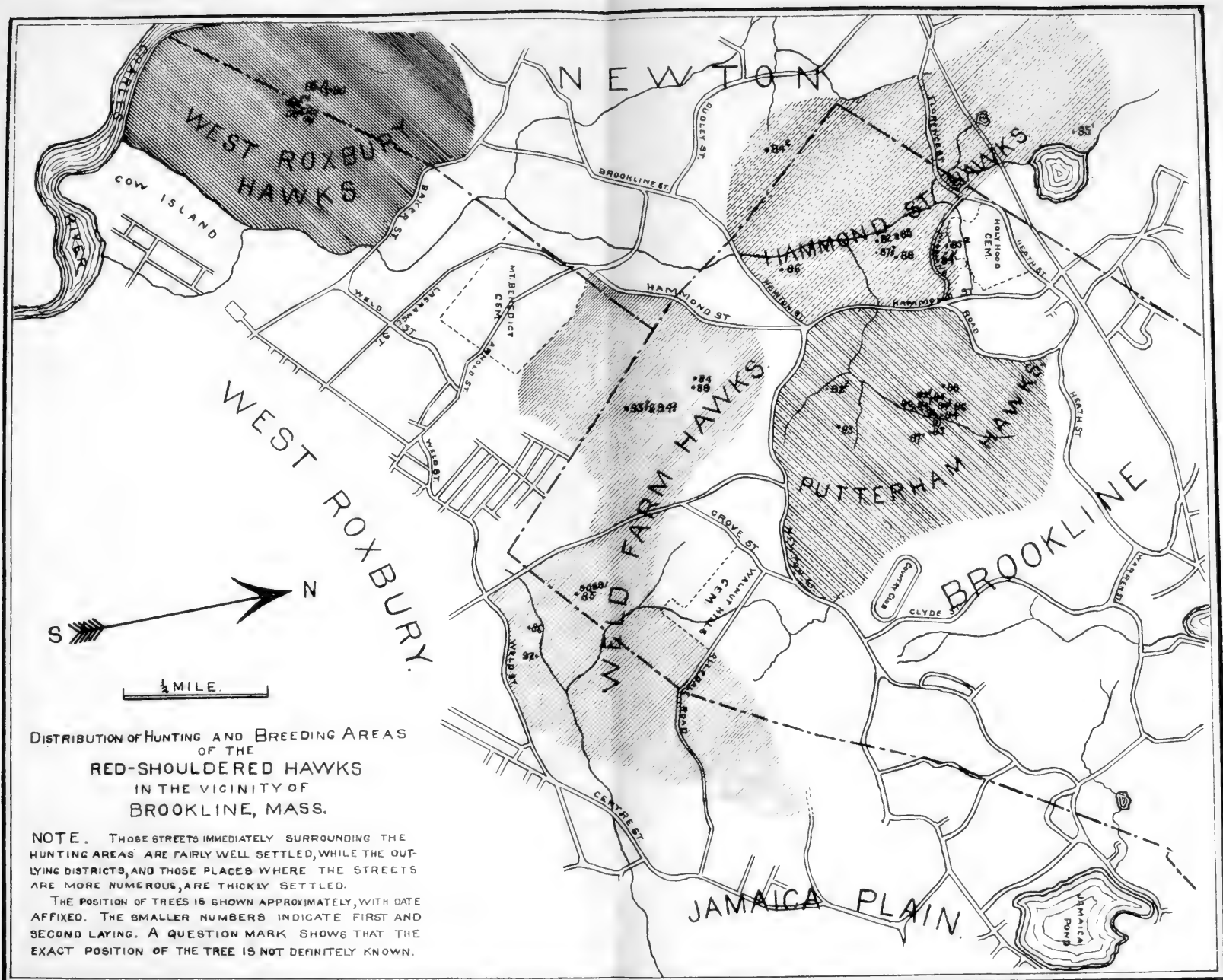
I would hereby recommend that any one in search of Hawks' nests should invariably carry opera glasses. It may save many feet of useless climbing.

For the sake of convenience, I will take up each pair of birds separately, and go through with their histories one at a time, rather than take them up in the order of my observations, and chronicle them by years. Again, for convenience, I have called each pair by a rather arbitrary and local name, on account of the particular territory in which they are most frequently seen, and in which they almost invariably chose to build.

There are but four pairs with whom I am on at all intimate terms, and at whose abodes I am received as a regular visitor. My data with regard to other Hawks of this species, whose acquaintance I may have made casually, as it were, I have purposely left out.

The Weld Farm Hawks have been thus called because of their marked fondness for that locality on the border line between

100 W. 11th St. N.W.
Minneapolis, Minn.



DISTRIBUTION OF HUNTING AND BREEDING AREAS
OF THE
RED-SHOULDERED HAWKS
IN THE VICINITY OF
BROOKLINE, MASS.

NOTE. THOSE STREETS IMMEDIATELY SURROUNDING THE HUNTING AREAS ARE FAIRLY WELL SETTLED, WHILE THE OUTLYING DISTRICTS, AND THOSE PLACES WHERE THE STREETS ARE MORE NUMEROUS, ARE THICKLY SETTLED.

THE POSITION OF TREES IS SHOWN APPROXIMATELY, WITH DATE AFFIXED. THE SMALLER NUMBERS INDICATE FIRST AND SECOND LAYING. A QUESTION MARK SHOWS THAT THE EXACT POSITION OF THE TREE IS NOT DEFINITELY KNOWN.

А. П. ПЕТРОВИЧ

ПРИМЕР

Вопрос: Каким образом можно определить, является ли данное предложение истинным или ложным?

Brookline and West Roxbury, Mass., near the Weld Farm. The West Roxbury Hawks must not get mixed up with the above pair, as they live some two miles away, in a territory of their own, by the side of Charles River.

What I call the Hammond Street Hawks live invariably on the Newton side of Hammond Street, Brookline, sometimes in Newton, and sometimes on the Brookline side of the boundary line; though never coming to the Brookline side of Hammond Street, as that side is invariably occupied by what I call the Putterham Hawks.

I will take up with these Hawks in the above order, leaving the Putterham pair till the last, as they are perhaps of the most interest.

The Weld Farm Hawks inhabit a territory which is perhaps longer and more rambling in extent than any of the others, and which partly accounts for the fact that my observations of them have been fewer than of the others. They are also the shyest of all my friends, and have invariably built in the hardest trees to climb. They are very quiet, only screaming when it seems absolutely necessary for them to do so, in order to scare up their prey; and while they have built in almost every case nearer houses than any other pair, they seem to show a much more marked antipathy to coming either near their nest or near any one who is trying to watch them.

Though I have watched their nests for hours at a time, and until I should have thought their eggs would have spoiled, I have never been able to get a shot at them; and on only one occasion, when I covered myself up with leaves and sticks, have I known of their coming back to their nest while I watched, after once having been disturbed. Then, too, the female invariably got off the nest at my distant approach, and never waited till I pounded on the trunk of the tree, as other Hawks frequently do. Many Hawks, when one is robbing them, will come back and fly around screaming, either in the immediate vicinity or else high overhead. This pair never went through any such performance, but invariably and quietly disappeared.

It was on April 23, 1884, that I discovered my first nest of this pair, placed between 80 and 90 feet from the ground, at the top of a very tall and spindling soft-pine, at the foot of a high hill,

and by the side of a large swamp. The nest was so high up, and seemingly so old, that I should never have noticed it had it not been for the immense amount of downy feathers which clung to every outstanding stick or leaf. I was riding through the woods at the time, and had no climbing-irons, and so left the vicinity, as there was no Hawk in sight, and returned in the afternoon with a buggy, an Irishman, climbers, a two-bushel basket, and many fathoms of my mother's best clothes-line.

I had to cover myself up for over two hours before the Hawk would show herself sufficiently to be identified, and even then she only flew up, looked at the nest, and then quickly flapped off again. I managed to shin the tree, and procured the nest, as well as a set of two very peculiar, muddy-colored, and small-sized eggs, which were about one-half hatched.

On April 20, 1885, I found what I took to be this pair's nest about 40 feet up in the crotch of an enormous chestnut tree which grew beside a marsh near Weld Farm, and about three-quarters of a mile from where I had found it the year before. This nest was also covered with feathers, but after a terribly laborious climb, I found no eggs, neither did I even see the Hawks around it. Who or what robbed it, and how he or it got up to it, I never found out, unless by a tall ladder, for there were no marks of climbing upon the bark of the tree.

On April 14, 1886, I found another nest of what I now know to be this same pair, built in the crotch of a large oak, about 30 feet from the ground, and covered with feathers as the last two had been. This oak grew on a low hillside that overlooked some meadows, through which a brook ran, and was only about 200 yards from the nest of the previous year.

The Hawks behaved in exactly the same manner as they had on previous occasions. The nest was similar, and what is of more consequence, the eggs, four in number, which were about one-fourth hatched, were precisely like those found in 1884, queer, small, and mud-colored. I tried for nearly two hours to get a shot at the Hawks, but they never showed themselves even in the distance in that time.

I was unable to go after Hawks in 1887 at all, and while I have reason to think that this pair built in the same locality in 1888, only farther towards Jamaica Plain, I was unable to find their nest.

In 1889, April 24, I again found their nest in a tall pine, almost where I had found it in 1884. These eggs, which were four in number and almost fresh, were procured by Mr. N. A. Francis. They were, however, entirely different from those I had found in previous years, and of a more ordinary type: and the nest, too, was less surrounded by feathers, probably on account of the shortness of the time that the birds had been setting. Perhaps the old female Hawk had been shot. If she had not, she had entirely changed her views with regard to egg coloration.

In 1890 and 1891, I again observed these birds in the same locality, but was unable to find their nests, owing to the size of their territory, and the fact that they were apt to build in deciduous trees. One can easily examine all the evergreens in the vicinity, as there are comparatively few, but deciduous trees are often too numerous.¹

On April 24, 1892, I, however, found the nest again, near where I had found it in 1886. This time they had built in a pine, and about 75 feet from the ground. The eggs, four in number, and about one-fourth hatched, were similar to those procured in 1889; and as the female appeared to be much tamer than the one that built here in '84, '85, and '86, I concluded that perhaps I was right in inferring that she was new, and that her predecessor had perhaps been shot sometime during the year 1887.

During the winter of '92 and '93, most of the country through which this pair had been accustomed to hunt was denuded of trees, and it was not till late in June that I finally discovered that these Hawks had built in a large swamp, near to their nesting places of 1884 and 1889.

So it can be seen that this pair had a strict liking for one locality, even if that was an extended one. They invariably built in very large trees, three times in high and spindling pines, once in an enormous oak, and once in a tall chestnut. They are extremely shy and wary and very quiet.

¹Since writing the above, Mr. A. L. Reagh, who lives in West Roxbury, has written me that in 1890 and 1891 this pair built in what was probably the same enormous chestnut that they had built in in 1885. He knows that they raised the 1890 brood, and is quite positive that they also raised the 1891 brood, as he saw young Hawks around there in the summer. I did not visit this tree in these years, as a house had been built near by, and I thought that the Hawks would probably build farther off.

The West Roxbury Hawks showed a very different individuality from the above pair. They were quite tame and very noisy, much more local in their habitat, and though they often built in large trees, they never built far from the ground, and always in a tree very easy to climb.

I first became acquainted with this pair on April 22, 1885. I found their nest, which contained one fresh egg, about 40 feet or three-fourths of the way up a small pine, which grew at the edge of, and leaned out over a small pond.

The female was very tame, and so hard to get off of the nest that pounding had no visible effect, and I was finally compelled to throw sticks at her. She was very vociferous after I had dislodged her, and flew screaming high above my head.

I came back here on April 25, and procured two handsome eggs, while the female acted as she had three days before.¹

On April 17, 1886, I again found this bird's nest, this time in a small hemlock that grew on a ridge about 30 feet high, on the opposite side of this same pond. I procured three fresh eggs, similar to those of the previous year, and also trapped the female Hawk. I tried to get her down the tree alive, but she was too fierce, and I was compelled to shoot her before I could climb near her.

I did not visit this place either during 1887 or 1888, but know that the male had mated again, as I found the deserted nest of this pair both in 1889 and 1890, and saw and heard both birds often. Both times they had built in a dark swamp, about two hundred yards from where I had previously found the nest, and each time in such easy trees to climb and in such conspicuous places that somebody else had got ahead of me. On May 26, 1891, I found the nest of this same pair of birds in this same swamp, and I copy from my notes as follows: "A nest in a tall large pine, forty feet up, and containing two downy young. They cried just like the old ones, and the female sat around on the neighboring trees, and often flew quite close to me. She seemed

¹ The female of this pair was evidently an immature specimen, and the eggs were very small, and the date of their laying was rather late for this species. Having found other nests where similar conditions prevailed, I infer that there is a possibility that young Hawks may breed a little later than they do when older, and perhaps their first eggs may be smaller.

very much worried, particularly when I was wringing the neck of one of the young. His crop and stomach proved to be full of feathers from some small birds, not distinguishable, hair and bones; and besides all this, he had pieces of a frog, one whole mole, and a snake ten inches long,—a moderate lunch for a youngster, who could hardly have been a fortnight old! He, by the way, was much the larger of the two. May 31, 1891, I returned to this nest and took the remaining young one. He had grown much in five days."

In fact he who had been the smaller one on the 26th was now, five days later, as much bigger as the other one had been bigger than he. "His crop and stomach contained feathers, hair, bones, etc., besides parts of two frogs, and a mole. No wonder he grew! I wonder that the Partridge, whose nest I found near the foot of this tree, had been left unmolested!"

On April 28, 1892, Mr. N. A. Francis procured three eggs from a nest built by this same pair in the same small swamp in a very large, easily climbed tree, such as they always seemed to show such a preference for.

In 1893, though I saw this pair in the vicinity, I was for some reason entirely unable to find a trace of their nest. Perhaps they had taken to a deciduous tree in a very large and adjoining swamp, and were harder to find on this account.

Here is a pair of Hawks whose individualities are quite distinct from those of the previous pair. Instead of choosing several places distributed over an area of several square miles, they seem to have built almost invariably in a place not one-eighth of a mile square. While the previous pair were wild, shy, and seldom noisy, and built in high trees, either evergreen or deciduous, this pair were comparatively tame and confidential and very noisy, and so far as I know, always chose easily accessible evergreen trees for their nesting, and the female almost always waited till I pounded the tree before departing.

The Hammond Street Hawks first came to my immediate notice April 17, 1884, when I found a set of three fresh eggs in a nest built about 30 feet up a fair sized pine, by the side of a swamp, and in a very conspicuous place. There was nothing unusual about the nest, it being a bulky structure of twigs, leaves, etc., and lined with fresh hemlock boughs and strips of

long, stringy bark. The female has proved to be just an average Hawk not especially wild, and yet knowing how to keep her distance, always waiting till I have approached quite near the tree before flying off, and never waiting till I pounded on the trunk, as the West Roxbury birds did.

On April 23, 1885, I found the nest of this pair built near the top of an enormous hemlock nearly 60 feet from the ground, on a hillside beside a swamp, nearly a mile from the scene of last year's capture, and it was an exceptional case for this pair. I never knew them to go so far again, and I never knew them to build in any but small trees in very open woods, except on this one occasion.

On May 23, 1885, just one month later, I found the second nest of this bird in the top crotch of a small slender oak, about 40 feet from the ground, right beside the pine in which the nest had been built the previous year. There were three boys, each doing his best to climb up to the nest, without avail. I felt my honor at stake; and so, though I was clad in my Sunday best, I climbed that tree and got three fresh eggs for my pains.

April 15, 1886, I found this pair of Hawks apparently building a nest in a slender red maple in sight of the street, and not far from the scene of my last find. It proved, however, that they were obtaining sticks from an old nest, and were building three-fourths of a mile away, on the other side of the marsh, in a low pine tree. This nest was too near a Gypsy encampment, and I procured no eggs.

April 14, 1888, I went up to a Hawk's nest in this same locality, built in the crotch of a slender chestnut tree in a very conspicuous place, beside a path. It contained two Hawk's eggs, and one broken hen's egg. As the set was evidently imperfect, and as I did not care for the two remaining eggs on that account, I placed two steel traps in the bottom of the nest and waited around for three-quarters of an hour, with no result. I returned on the next day, however, and found both Hawks had been caught by their legs. I was unable to get them alive, and keep my own skin whole, and so was forced to shoot them.

I found out afterwards that Mr. J. A. Lowell of Chestnut Hill, Mass., had taken two eggs from this nest on April 7, and left two hen's eggs in their place, thus making the total number of the set four.

I have since ascertained that Mr. J. A. Lowell found what was probably this same pair breeding in the same locality, as follows: Last of May, 1882, three young in a chestnut tree; middle of April, 1883, three eggs from the *same* nest; May 13, 1884, two eggs in a hemlock tree (probably second brood); April 7, 1887, three eggs in a white pine; thus filling out my list, and accounting for this pair for every year.

This pair seems to have shown a marked liking for a certain not very large area, and they never but once strayed beyond it. They never but once chose a large tree, and did not seem to like evergreen trees any more than deciduous trees, and were, on that account, harder to find than the West Roxbury pair. They built three times in pines, twice in hemlocks, three times in chestnuts, and once in an oak: only once more than forty feet above the ground, and generally less, and almost always in conspicuous places. I have never known of their crossing Hammond Street, though their territory bordered it for half a mile, for on the other side of this street, and in a parallel area, is the abode of the Putterham Hawks. I have but seldom seen the Putterham birds cross Hammond Street, and I have never known of their building on any but their own side. Their territory is more compact than that of the Hammond Street pair, and contains thicker woods and more evergreen trees. As they are bounded on the west by the territory of the Hammond Street pair, and on the south by that of the Weld Farm pair, I have noticed that when not in their very particular haunts, they may be found to the north and east, which is pretty well civilized. Thus it is that each pair of these birds seems to hunt over its own area exclusively, and by a tacit understanding, never seems to trespass upon that of its neighbor. I have often been in a position to hear and see both the Hammond Street and Putterham pairs at once, and I have never seen them even so much as shake hands over their boundary line.

Though I had known of the Putterham Hawks for several years, and had known of others finding their nests, and in 1884 had found a nest myself in a pine, that had just been robbed of three eggs, it was not until 1885, on April 19, that I got my real introduction to them. This nest, containing three fresh eggs, was placed about 35 feet up in a large pine, in some wet woods about 150 yards from last year's nest.

On March 29, 1886, I found a nest with two fresh eggs, within 50 yards of where the nest had been built in 1884. I set traps in the nest, and on April 1, I found the female caught. She had also laid a soft-shelled egg, which showed that my set of two eggs was incomplete. The male mourned the loss of his mate only until he could get another, which he did during the following spring; and they built again in a pine tree near this same place in 1887. This nest was found and robbed by a friend of mine.

On April 20, 1888, I got two eggs out of a nest in the crotch of a chestnut tree beside a path about a half of a mile away. It was a full set, as I watched it several days before taking it. The male bird, which I caught but let go again, did some of the setting, and was so small that I was puzzled till I caught him as to his identity.

On April 9, 1889, I saw feathers in the above nest, and on this account shinned up to it, only to find the nest empty. About 100 yards off, however, I found in a slender oak the bird's real nest with two fresh eggs, and was forced to infer that they had been using nest number one for a resting and feeding place only. As I did not want to 'get left' this way again, I knocked the nest, from which I had just taken the eggs, out of the tree, of which more anon.

On April 13, 1890, I found one egg in a nest in a low pine in a dark swamp, about 100 yards from the last nest. I shot the male Hawk as he flew off, taking him for an instant for a Cooper's Hawk which I knew was breeding somewhere near; so I was compelled to take the egg, as I doubted whether the female would go on any further with the duties of maternity.

This nest, by the way, was an old nest, and one in which I had seen feathers two years before. I had then climbed the tree and found some of the feathers and bones of a Partridge, on which one of these Hawks had probably been feeding.

April 16, 1891, the female had evidently got a new mate, for I found a set of three eggs in an old nest placed perhaps forty feet up in the crotch of a tall chestnut, and within 50 feet of the place where I had found their nest in 1884. This nest had, I think, been built for a second set, in May, 1889. It was not there in April of that year, and I found it there that autumn. In 1890 I had come very near climbing up to it because of

feathers around it, but I was fortunately prevented by the timely finding of the real nest in a pine tree near by, as told above.

In 1892 this pair built in the same slender oak from which I had knocked their nest in 1889, and in identically the same crotch. Somebody, however, had robbed it before I found it. Still these birds were not discouraged, for on June 22 of the same year Mr. Francis took three fresh eggs from a nest which I feel sure belonged to this pair, built about a half a mile off on the other side of a swamp.

On June 10, 1893, after searching for the nest of this pair intermittently, though carefully, for two months, I finally located them about 50 feet up in an enormous pine, about a half a mile from their usual location. I had always wondered why these Hawks did not build in this pine, or in one of the group to which it belonged, for they are all nearly 150 feet high, and about four to five feet in diameter at the base; but, nevertheless, I became, to put it mildly, a trifle chagrined when I found where the nest really was.

On June 12 I returned, and by the aid of ropes, strings, climbing irons, and two other people, I managed to get up the tree, though it took me twenty minutes to do so, and less than twenty seconds to come down.

There were three young birds, which I will describe later; and while their parents flew screaming around my head, I lowered them down in a basket and took them home alive, leaving their persevering parents to start anew, if they cared to.

This pair seem to have shown no particular preference in their choice of trees, as they built five times in evergreens and five times in deciduous trees. They evidently preferred one small locality for their nesting, though their hunting grounds were quite extensive.

Summing up, and comparing the histories of these birds, so far as I can judge from my limited experience, I should say that they almost invariably choose as a place for nesting, a tree, either evergreen or deciduous, beside some swamp, brook, or wet meadow; and if they once learn to feel at home in a certain locality, provided that that locality does not become too open and civilized, they will almost invariably return to it, even when repeatedly disturbed.

If they are both killed, and their hunting grounds are good, these are soon occupied by others; or if one is killed, the other soon returns with a new mate. After I had killed the Hammond Street Hawks in 1888, Mr. Lowell writes me that in May, 1891, he found a nest containing two young birds in this same territory; and on April 8, 1892, he procured two fresh eggs from the same nest. This would go to show that if there is good hunting territory, whose owners vacate for some reason, it is immediately taken possession of by the young of some of their neighbors.

Once laying claim to any territory they are exclusive to a degree. This exclusiveness, however, seems to apply to their own species merely, for other Hawks are allowed to hunt in their territories at will. I have known of a Sharp-shinned Hawk's nest being almost within a stone's throw of a Marsh Hawk's nest, and both these nests to be on the borders of a meadow, beside which a pair of Red-shouldered Hawks nested each year. Four times in my life I have known of Cooper's Hawks building either in sight of, or almost beside the nest of a Red-shouldered Hawk.

In their choice of trees in which to build they show a wide diversity and often a strict individuality, and in most cases, a marked love of locality which may be more or less modified by the individuality of the bird.

In their habits, too, each pair seems to show its own characteristics, some being shy and quiet, others very noisy and easily approached. I noticed, too, that those Hawks whose hunting grounds are thickest and contain the best timber and the most evergreen trees are most apt to winter with us; for instance, the Putterham pair are almost always to be found and heard winter as well as summer, while the Hammond Street pair, whose grounds are bleak, are almost never to be found during the winter. While many of these Hawks stay with us all the year round, I believe there is a certain migratory movement among them, for I know they become less in number in winter, and the only reasonable inference is that some of them go South. During the past winter, 1893-'94, until Feb. 22, when I again saw one of the Putterham birds, I have failed to see any of these Hawks, though often in the field. Even the Putterham birds seem to

have been scared away by the severe weather of December, to return only when warmer weather was promised.

That they may return in consecutive years to the same nest, if not disturbed, and sometimes even when they have been disturbed, I have no doubt. I personally have never found them laying in the same nest two years in succession, though I have known of their using the same nest twice, with an interval between. They seem very apt to use their old nests for roosting and feeding places, as feathers from them, as well as from birds they have killed, would seem to indicate.

Although the Report on 'Hawks and Owls,' issued by the Agricultural Department, seems to show that this bird is not only harmless, but truly beneficial, I must say that Hawks differ, and Red-shouldered Hawks certainly.

If it were not for this personal equation, this individual characteristic, as it were, where would the teachings of Darwin and Spencer be?

In each of the Hawks of this species that I have examined, I have invariably found feathers and birds' bones, and lots of them. The frogs alone, of which they eat great numbers, would seem to more than balance the injurious rodents of which they are also fond; and as for insects, I do not believe that the Brookline Red-shouldered Hawks eat as many in a year as an ordinary frog could in a day. They must differ in their habits, and accommodate themselves to their surroundings. Perhaps they are, as a species, beneficial, particularly where they hunt in open country; but in such country as we have around Brookline, I am sure they do more harm than good. Both birds help build their nest, a more or less clumsy structure of twigs, dried leaves, etc., and almost invariably lined with fresh hemlock or pine boughs and the long stringy inner bark of the hemlock tree or the outer bark of the wild grape vine. The male also assists in the incubation. When their nest is disturbed they are more or less officious according to their individuality, and according to the length of time they have been setting. They are particularly worried if their young are disturbed, though I have never known of their really attacking a man. They may do so in the far West; but they know us too well in the East.

Their eggs, so far as I can judge, are generally laid at intervals of about two days, and I have often noticed that if there is any

material difference in the quantity of markings, that the egg that is first laid has the most, while the last is most free from spots.

With regard to their second laying when disturbed, it is necessarily hard to get accurate data, and I am not at all certain that they always do lay again. I do know, however, that they are extremely erratic, both as to time and place, when they do lay again. If you have learned to know a pair, you can tell pretty well about where their first nest will be; but their second nest hardly ever, for they are very apt to go off to some unexpected place in some swamp or elsewhere, where you have never known of their breeding before.¹

NOTES ON THE GENUS *HELEODYTES*, WITH A DESCRIPTION OF A NEW SUBSPECIES.

BY A. W. ANTHONY.

IN HIS catalogue of the 'Birds of Lower California' Mr. Bryant makes mention of the unusually heavy markings on the lower parts of all of the *Heleodytes affinis* taken by him on the overland trip from Magdalena Bay to San Quintin. It was these notes on the species that suggested the investigation that led to the present paper.

During my first season in Lower California (1887) collections were made from Ensenada — sixty miles south of San Diego — to San Anderes, about Lat. 28° 30', covering a distance of about two hundred miles in latitude. A fair series of Cactus Wrens were taken, but these, unfortunately, were stolen, together with my entire season's collection. Later a series was secured from about San Quintin and San Telmo — fifty miles north — but the gap of about one hundred and fifty miles that intervenes between Mr. Bryant's northernmost specimens and mine from San Quintin remains unrepresented. However, a sufficient series of Peninsula and Southern California skins has been brought together to change, somewhat, the status of both the Cape species as well as

¹ The 1894 nests, found since this paper was written, have been added on the accompanying map.

the birds from the northern part of the Peninsula and adjacent region of San Diego County, California. Unfortunately no specimens are obtainable from the mouth of the Colorado River and Gulf coast of Lower California, though Mr. F. Stephens has kindly loaned me, among others, a specimen from the Colorado Desert and two from Sonora.

Beginning with a specimen from La Paz (No. 15,003, Coll. Wm. Brewster, April 4, 1887), which Mr. Brewster assures me is perfectly typical *H. affinis*, I find the entire lower parts well spotted with black, evenly distributed and of equal size on the breast and lower parts. Those on the lower tail-coverts are larger and on the chin slightly smaller; across the breast the spots are not quite so well defined and are a very little more abundant, suggesting somewhat the nebulous spotting of this region in typical *H. brunneicapillus*. On the flanks and belly there is the faintest possible suggestion of the rufous found in *brunneicapillus*. All but the central tail feathers are fully barred on the inner webs with quadrate white spots, reaching nearly or quite to the shaft.

Another specimen from La Paz, collected by L. Belding, bears upon the label, in Mr. Belding's handwriting, "Typical (B.)." This shows rather heavier marks upon the throat and upper breast but is otherwise the counterpart of the first described. A third skin (No. 216, California Acad. of Science) is labeled "La Paz, Lower California," but is without other data. This specimen represents fairly well the Wren met with much farther north, but differs from either of the others in a more heavily spotted throat and breast and smaller spots on the sides and belly. The latter feature is, however, not at all prominent in any of the Peninsula skins I have examined and is perhaps more pronounced in the present specimen than in any I have seen from Lower California.

Coming northward along the Peninsula a very heavily spotted race is met with, which reaches its highest development, as far as can be ascertained by the series now at hand, at San Telmo, about fifty miles north of San Quintin.

This subspecies I propose to name *Heleodytes brunneicapillus bryanti*, in honor of Mr. W. E. Bryant, whose name is too well known in connection with the ornithology of Lower California to make comment on my part necessary.

***Heleodytes brunneicapillus bryanti*, subsp. nov.**

Type, No. 3879, Coll. A. W. A., San Telmo, Lower California, April 30, 1893.

Subsp. char.—Differing from *affinis* in very much heavier spotting of lower parts, the black predominating, in extreme specimens, on the throat and upper breast, and in its perfectly barred tail and slight wash of rufous on belly and flanks; from *brunneicapillus* by heavier spotting, especially on sides and belly, in having intermediate rectrices more or less perfectly barred, and in much less rusty wash on lower parts.

The proposed subspecies is readily distinguished from either *H. affinis* or *H. brunneicapillus* by its much more heavily spotted lower parts; in other respects it is practically intermediate. In *brunneicapillus* the heavy band of semicircular or ovate black spots that covers the breast and throat abruptly gives place on the lower breast, sides and belly to a much less conspicuous spotting, elliptical or linear in shape. *H. affinis* is not more conspicuously spotted on the breast and jugulum than elsewhere, and the spots are rounded or ovate on the sides and belly as well as the breast. *H. b. bryanti*, on the other hand, while more heavily spotted than either, exhibits a conspicuously darker jugulum and breast, as in *brunneicapillus*, with the rounded or ovate spots of *affinis* on the sides and belly.

As a rule *bryanti* exhibits a fully barred tail as in *affinis*; occasionally, however, one or more of the intermediate feathers has light spots indenting the inner web in place of reaching the shaft. In the Lower California series there is but little variation in the markings of the rectrices, but when southern California is reached there is a confusion of markings that makes classification seem at first almost hopeless. In the series before me can be found birds with tails typical of *brunneicapillus*, *i. e.*, with first feather barred only on the inner web. Others have all the feathers barred except the two central ones, as in *affinis*; and, of course, there are all the intermediate changes between the two extremes. A closer examination, however, shows two general types with, of course, some few that are as easily referred to one as the other. Birds with heavily spotted breasts, and sides with large ovate spots, exhibit the well barred tails, and little, if any, rufous on the flanks, while linear spots on the lower parts, which

in such cases are less conspicuously spotted below than on breast and jugulum, are as sure to have a heavier wash of rufous and only the first rectrix barred with, perhaps, one or two more or less perfect bars on the lower fourth of the second, or white spots indenting the webs of some of the others.

The tails of specimens from western San Diego County are not always the same on both sides, several being found that are noticeably different. No. 127, Calif. Acad. Science, San Diego, Cal., Mar. 15, 1884, which is referable to *bryanti*, has the right side fully barred to the sixth feather, the left equally well marked to the third inclusive, the fourth and fifth showing small white spots where the bars should be. East of the Cuyamaca Mts., I am unable to find any indication of either *bryanti* or *affinis*, but my specimens from that region are unfortunately very few. A specimen from Walters, Colorado Desert, Coll. F. Stephens, Jan. 1890, exhibits a heavily marked throat and breast with abruptly smaller, linear spots on the sides and belly—in all respects indistinguishable from Arizona and New Mexico skins.

In connection with the foregoing notes on the series from San Diego County, I would call attention to Prof. Baird's remarks in 'Review of American Birds' on Lafresnaye's description of *brunneicapillus*: "I find it quite impossible to reconcile Lafresnaye's description of *C. brunneicapillus*, much less his figures, with the North American bird. This is described as having five white spots on the outer web of the lateral tail feather, and three on the inner, the next with two on the outer and three on the inner (perhaps three on the outer and two inner), the third and fourth with marginal points instead of spots." The specimen is said to have come from California and I think that it would be very easy to match the above description with a bird from the immediate vicinity of San Diego, though in nearly all of those before me the number of bars, ranging from five to seven, are the same on both webs, but are occasionally one less on the inner. The marginal points on the third and fourth feathers is a common feature. Lafresnaye, however, describes the under parts of his bird as pale rufous from the upper part of the breast to the tail. In all specimens I have examined the rufous is confined to the flanks and abdomen alone and is not so

pronounced in western San Diego County skins as those from San Bernardino County (Cal.), Arizona, and New Mexico. As far as the description of the rectrices is concerned it would seem as if the type might very possibly have been one of the intermediate birds I have described, in which case the bird of the interior would be eligible to a new name. Owing, however, to very reasonable doubts as to its origin, it is probably better for the present, at least, to recognize the name as it has stood. It will be necessary, as has been proven by the series before me, to reduce the heretofore species *affinis* to the rank of a subspecies of *brunneicapillus*.

Since the preceding was written a further series of Peninsula specimens has been taken from San Quintin to San Fernando, thus making an almost complete chain from San Diego to Cape St. Lucas. The more southern skins, from San Fernando, are rather nearer *affinis* than *bryanti* but are typical of neither. Owing to lack of material I am unable to make a satisfactory disposition of the Cactus Wrens from north of the boundary. The series at hand points toward a race inhabiting the southwestern part of California, differing from the bird of Arizona, New Mexico and Texas. It would be unwise, however, to attempt to assign definite characters or habitat without much more material than is at present accessible.

Mr. Ridgway writes me that a series of skins from Guymas, Sonora, exhibit exactly the characters of my San Diego County skins as regards tail markings—a more or less complete barring on the inner webs—pointing toward an intergradation with the Lower Californian forms along the Gulf Coast and border of the United States.

I am greatly indebted to Messrs. W. E. Bryant, F. Stephens and William Brewster for the loan of valuable specimens used in this connection, and also to Mr. R. Ridgway for notes on the specimens in the National Museum Collection.

ORNITHOLOGICAL NOTES ON A FLYING TRIP
THROUGH KANSAS, NEW MEXICO,
ARIZONA AND TEXAS.

BY HENRY K. COALE.

HAVING occasion to visit a number of United States Army Posts in the Southwest, I left Chicago March 15, 1890, taking along a collecting outfit, although the trip was made with another object in view. The present paper does not pretend to be a list of the birds inhabiting the localities visited, being simply a record of such observations as came under the writer's notice during the few hours spent in collecting specimens in the vicinity of the Military Posts.

It was with pleasant anticipations that the trip was begun, which was to carry me into new fields and among the many (to me) rare birds that I had only before read of in books, or seen in collections. The day I left Chicago Canada Geese and Herring Gulls were flying over in a northwesterly direction. In passing through Missouri flocks of Blackbirds, Juncos, Horned Larks and other early spring migrants were seen in the fields along the road. The weather was perfect, except where otherwise noted.

Fort Leavenworth, Kan., March 16, 1892. On a bluff overlooking the Missouri River. In the great elms that surround the parade ground numbers of Bluebirds, Baltimore Orioles and Robins were singing their glad songs to the awakening of spring. Meadowlarks, Goldfinches and Downy Woodpeckers were plentiful about the Post.

Fort Riley, Kan., March 18. On the U. P. R. R., northeast of the center of the State, on the Smokey River. Spent a few hours in the bottomlands across the river, where a luxuriant growth of trees and bushes afforded shelter for troops of Cardinal Grosbeaks, Slate-colored Juncos, Fox and Song Sparrows, Black-capped Titmice, Vireos and other familiar birds. A small flock of *Zonotrichia querula* was feeding in the tops of some bushes. A shot brought down a male and female; the rest flew away and were not again met with.

Fort Logan, Colo., March 20. Seven miles from Denver. A barren sand desert, with a scant growth of trees along Clear Creek. Birds were exceedingly scarce, a ride of ten miles with Mr. H. G. Smith, Jr., a local collector, revealing less than a dozen birds, except Black-billed Magpies, which were common. *Melospiza fasciata montana*, *Junco annectens* and *Merula migratoria propinqua* were the only species secured. The English Sparrow of the eastern cities is replaced in Denver by the House Finch, which builds its nest under cornices of the big down town stores. It perches on the office window sills and sings prettily. It was found to be common at nearly all the frontier posts, building under the low roofs of the verandas, on any suitable projection.

Fort Union, N. M., March 22. On a level plain ten miles from Watrous. About a mile back of the post is the old abandoned Arsenal which was Kit Carson's headquarters during the war. His house and garden are now in a very dilapidated condition. *Pipilo fuscus mesoleucus* was hopping about on the roof; *Sayornis saya* flew in and out of the vacant parlors; *Junco annectens* rambled among the weeds in the garden; while *Sialia arctica* warbled its pleasing notes in the trees surrounding the house. Among the rocks behind the Arsenal, Juncos, Pipilos and Western Robins were seen. The Cañon Towhee frequents the back yards of the officers' quarters, and may be seen perched on the shed or fence, allowing one to pass within a few feet without taking flight. In the post garden I noticed a curious trick of the Mountain Bluebird. Toward dusk they repaired to a piece of plowed ground in search of their evening meal, hopping among the overturned sods in pursuit of insects or worms. Every few minutes some male would utter his spring song, then rising in the air would flutter in one spot about ten feet above the ground, moving its wings with great rapidity for a minute or two, when it would join its companions on the ground. In a bush near the garden I shot a beautiful male *Pipilo maculatus megalonyx*, and on the open plain a pair of *Rhynchophanes mccowni*. A few birds were foraging among the refuse back of the corral. A number of flocks passing over saw them and alighted on the ground. These were joined by others until a space of several hundred feet was literally covered with them.

They all headed in one direction, feeding and constantly moving forward. A shot at long range brought down six or seven *Otocoris alpestris arenicola*, and only disturbed a few of those nearest. The vast army of hundreds of Horned Larks paid little attention to me as I picked up the dead ones. They moved on, surrounding me on all sides, the nearest being not more than a hundred feet off. They were twittering merrily, and now and then some bright plumaged male would indulge in a song, or engage in a set-to with some rival. Suddenly four strange birds, attracted by the moving troops of Larks, dropped among them, their black breasts easily distinguishing them from the others. They proved to be Chestnut-collared Buntings (*Calcarius ornatus*), and as each fell a number of the Larks shared its fate. No others were met with.

Fort Marcy, N. M., March 25. The post is surrounded by the old Mexican town of Santa Fé. Near the fort is a deep cañon with plenty of trees, and a tiny brook trickling among the rocks. A Horned Owl that I had not noticed sailed out of a big tree as I passed and was soon out of sight over the hill. Several *Myadestes townsendi* were perched on the tops of tall bushes at the entrance to the cañon. Three species of Junco were secured: *J. hyemalis*, *caniceps* and *annectens*. The only other birds observed were the Mountain Bluebird and Long-crested Jay (*Cyanocitta stelleri macrolopha*).

Whipple Barracks, Ariz., March 31. Elevation 6500 feet. One mile from Prescott. My host was Captain W. L. Carpenter, an ardent student of nature. This was the only point where inclement weather made collecting disagreeable. The snow was an inch deep and still falling when we went out among the rocky, pine-clad hills along the creek. Very few birds were seen. In a small tree a tiny bird was hopping among the branches, which proved to be Lucy's Warbler (*Helminthophila luciae*), an adult male. *Junco hyemalis thurberi* sought shelter from the storm in a scrub evergreen.

Fort Verde, Ariz., April 2. Elevation 4500 feet; forty-five miles from Whipple Barracks. Winter there, summer here. The clean sandy bottomland of the Verde River, with its abundant growth of huge cottonwood trees in full leaf, formed a paradise for birds, situated as it is among the moun-

tains at the mouth of the grand Copper Cañon. Numerous low sand-hills covered with bushes offered convenient shelter for little parties of Gambel's Quail, which were constantly flushed and ran ahead as I walked along the river bank. In the cottonwoods birds were as plentiful as in the woods of Illinois during the migration. *Dendroica aestiva sonorana* and *D. auduboni* were abundant. Several of the delicate little Lucy's Warblers were taken. Their peculiar song is easily recognized when once heard. Crimson-fronted House Finches, Vesper Sparrows, Western Chipping and Brewer's Sparrows, Lincoln's Finches and Cañon Towhees were on every hand. Black Pewees, Rough-winged Swallows, and White-throated Wrens were also secured. There being no grass, every bird shot fell on the clean sand and was easily found. The most striking bird of the Verde Valley is the Vermilion Flycatcher (*Pyrocephalus rubineus mexicanus*), its brilliant plumage and flaring crest being seen at quite a distance among the green foliage. A specimen of the Rock Wren was shot in the brush. *Pipilo aberti* lurked in the darkest bush clumps, his loud *chuck* leading to the capture of several specimens. *Amphispiza bilineata* frequented the weeds about the fences, as did the Arizona Goldfinches and Western White-crowned Sparrows. An hour or two in the morning would furnish all the birds I could prepare by midnight, and it was with great reluctance that I left this beautiful spot on the Verde.

On the way back to Whipple I found the nest and eggs of the Lead-colored Bush-Tit (*Psaltriparus plumbeus*) and shot the male bird. The nest, shaped like a purse, is eight inches long and three and three-quarters inches in diameter (a large structure for such a tiny bird), and was suspended from a bush four feet from the ground, close to the road. There is an opening about the size of a silver quarter on one side near the top. The walls of the nest are nearly an inch thick and very soft, covered with a wonderful collection of fine leaves, catkins, feathers, and tufted seeds, besides other materials difficult to describe, the whole presenting a beautiful example of bird architecture. The bottom is lined with a soft bed of downy feathers, on which reposed five pure white eggs, averaging $.52 \times .37$ inches, and perfectly fresh. I believe this is the second description of the nesting of *Psaltri-*

parus plumbeus. (See Proc. U. S. Nat. Mus., 1887, p. 557, for first record.)

Fort Mojave, Ariz., April 6. Situated on the Colorado River, seventeen miles north of The Needles, in a desert with its thorn bearing mesquit and other bushes. The Mojave Apaches are camped about two miles above the post in the river bottom. They are peaceable and some of the officers hire them to act as 'strikers' or servants in their houses. They wear no clothes except a piece of cloth around the loins. The women and older girls wear a short calico dress. Birds were not very plentiful. The place is one of the hottest in the United States, the thermometer ranging from 100° to 120° F. in the shade. *Auriparus flaviceps* had just completed its nest in a mesquit. Troops of *Zonotrichia leucophrys intermedia* were everywhere, and *Troglodytes aëdon aztecus* was not uncommon. A Curved-billed Thrasher (*Harporhynchus palmeri*?) was seen. Here again Lucy's Warblers, Brewer's Sparrows, and Cañon Towhees were taken, and on the road to The Needles I saw several of the black-crested *Phainopepla nitens*.

San Diego Barracks, Cal., April 12. In the southwestern corner of the United States, in the city of San Diego. A few birds were collected—*Amphispiza belli*, *Otocoris alpestris rubea*, *Zonotrichia leucophrys gambeli*, and *Tyrannus vociferus*. None of these were met with elsewhere.

Fort Lowell, Ariz., April 14. Nine miles from Tucson, where I had the pleasure of meeting Mr. Herbert Brown and inspecting his fine collection of Arizona birds. On the mesa, a barren waste between Fort Lowell and Tucson, is the favorite breeding place of Palmer's and Bendire's Thrashers. Their nests are placed in a cactus, each species seeming to select a different kind to build in. Specimens of each were taken: adults, half grown young of first brood, and fresh laid eggs. The full complement is three.

Dr. Elliott Coues gives an interesting account of the habits of the Thrashers inhabiting this particular locality in his 'Birds of the Colorado Valley.' The most abundant species noted was the Lark Bunting (*Calamospiza melanocorys*). These birds were on the ground in immense flocks, thousands I should judge, and were quite hard to approach. They kept running and flying

over each other, always keeping well ahead of me. Several were collected, but only a few in black plumage. At Fort Lowell the verandas of the officers' quarters are screened by rows of tall, thin cactus stalks which put out leaves in summer, making a compact wall. It is the custom to sleep out doors during most of the summer on the wide verandas, protected by this natural barrier.

Fort Huachuca, Ariz., April 18. The fort is at the mouth of a great cañon. Live oaks are growing everywhere in the post, and cottonwoods along the creek. The California Woodpecker is the familiar bird about the trees in the officers' gardens. Brewer's Blackbirds, California Jays and White-necked Ravens are common. Found a Road-runner's nest and five eggs nearly ready to hatch in a live oak, about six feet from the ground. Along the creek I secured a pair of Green Towhees (*Pipilo chlorurus*), not elsewhere met with. Also several Vermilion Flycatchers, White-rumped Shrikes, Western Bewick's Wrens and Black-capped Flycatching Warblers, Cañon Towhees, House Finches, one *Ceryle alcyon*, and a number of Arizona Jays (*Aphelocoma sieberii arizonæ*), the last two in Tanner's Cañon. Huachuca is the only place where I saw the 'sand whirls,' a solid column of sand which is lifted from the earth to the sky by the wind, having the appearance of a water-spout, which the reader may remember seeing pictured in his old geography.

Fort Grant, Ariz., April 22. Grant is twenty-seven miles from Willcox, Ariz. A creek with cottonwoods and underbrush affords an inviting place for collecting specimens. A hundred feet either side was the desert, with its cacti extending as far as the eye could reach. The first bird shot was *Mimus polyglottos*. No others seen. The most abundant species is the Mourning Dove. This bird flew up at every step. Another common species, not seen elsewhere, was *Icterus cucullatus nelsoni*. It frequented the tops of the cottonwoods and came about the officers' quarters, showing very little fear of man. *Helminthophila celata lutescens*, one female taken; also *Vireo solitarius cassini*. In a low bush I found a nest of *Pipilo fuscus mesoleucus* containing three fresh eggs. Also in a cactus, a nest and five eggs of the Cactus Wren, which was quite common on the mesa. One

nest contained five dried up little Wrens and the dead body of the parent resting upon them. This Wren has a habit of standing on top of the nest (which is a bulky affair usually in plain sight), and attracting one's attention by her notes. In another cactus was the nest and six fresh eggs of the White-rumped Shrike. The Western Yellow and Audubon's Warblers were quite common. A single *Peucea ruficeps boucardi* was shot.

Fort Thomas, Ariz., forty-five miles north of Grant, on the Gila River. I reached there after dark on the 25th of April. Early the next morning I was up and out. About half way across the parade ground was a solitary tree, which had the appearance of being loaded down with oranges. There was a tremendous chattering going on in that direction, sounding strangely familiar, but not until a dozen or more Yellow-headed Blackbirds dropped to the ground and began hopping about did I realize that the supposed oranges were the heads and throats of these handsome birds. Going into the house I got Lieut. R. D. Read to take a shot at them. He had to fire at long range. Thirteen were killed about the tree, and as the great flock rose and flew toward the corral several more were seen to drop; and the tree—it was a dead one, with not a single leaf on it. It was the custom of hundreds of these birds to perch in this tree every morning about sunrise and utter their loud notes. Around the corral the Brewer's Blackbirds were seen in large numbers and as tame as barn yard fowls. The same afternoon I went up the river thirty-three miles in a buckboard to

San Carlos, Ariz., one hundred and five miles from the railroad. On both sides of the river the San Carlos Apaches have their 'wickiups' or brush huts. There are thousands of these Indians and though generally peaceable, a number of renegades were out at this time, so that bird collecting was dangerous to attempt. At San Carlos the troops live in tents covered with brush (thermometer 100° to 120° in the shade). At sundown thousands of Yellow-headed Blackbirds came into camp and roosted on the brush on top of the tents. They were very tame here and seemed to know that no shooting was allowed. Saw many Road-runners in the brush along the road, and near Fort Grant shot a pair of Blue Quail (*Callipepla squamata*), a bird that frequented the desert where Cactus was the only vegetation.

Fort Davis, Texas, May 1. The fort is prettily located at the foot of some giant boulders that seem to have been thrown in a heap some two hundred feet high. Panthers, Mexicans, goats and Rock Wrens are about the only living things in the rocks. In hunting for one of the latter I got close enough to one of the former to see his glaring eyes in a dark cavern in the rocks. Here I was reminded that I was nearing my native hunting grounds by finding *Helmitherus vermivorus*, *Anthus pensilvanicus*, and *Chelidon erythrogaster*, and added to my collection specimens of *Speotyto cunicularia hypogaea*, *Passerina amoena*, *Sphyrapicus varius nuchalis*, *Pyrranga rubra cooperi*, and *Salpinctes obsoletus*.

Fort Clark, Texas, April 5. Ten miles north of Spofford Junction. Luxuriant growth of large and small trees, bushes and peculiar plants. One of the typical birds of this place is the Nonpareil (*Passerina ciris*). It sings from the top of a bush in the open woods. Cardinals, Lark Finches, Mockingbirds, Cooper's Tanager and other species were abundant. Capt. Vinton, of the post, told me of his seeing a flock of green Parrots with yellow heads at Fort Gibson, Ind. Terr., in 1886. They lit in a grove near the post and staid fully twenty minutes. No shot gun being handy they were not molested.

Stopped long enough in San Antonia, Texas, to see the principal streets. Noticed *Chondestes grammacus strigata* hopping about under the horses and wagons like 'our own' English Sparrow. A little out of the city saw several *Milvulus forficatus* on the telegraph wires, and at the rifle range ten miles out, they were flying about over the shooters' heads.

After a very pleasant trip, briefly outlined above, I reached Chicago May 10, to find it chilly and raining. The migration being late I had the pleasure of collecting a nice series of desirable birds during the month, among them *Turdus fuscescens salicicola* at Ravenia, Lake Co., Ill.

Here the writer would express his gratitude and appreciation of the many courtesies extended by the officers of the Army with whom he came in contact, having been taken into their homes and treated like a brother, although a comparative stranger to most of them.

NOTES ON CERTAIN WATER BIRDS IN MASSACHUSETTS.

BY GEORGE H. MACKAY.

THE entire month of March was unusually mild and warm, without storms, southwest and west winds generally prevailing. I do not remember ever having experienced a similar one. I passed through Vineyard Sound on my way to Nantucket Island, Mass., on March 9, 1894; also on my return on the 20th of the same month. On the 28th of April I again made the trip, returning on May 5. I saw but few sea fowl of any description. I was on Muskeget Island, Mass., March 11, remaining until the 18th. Prior to my arrival there had been about two hundred American Eiders (*Somateria dresseri*) living between Muskeget and Tuckernuck Islands, half of which had been killed, and a portion of the remainder driven away, before I arrived. Of these two hundred birds, three quarters were males. This number is less than were sojourning here last year and is undoubtedly owing to the scarcity of shell-fish food in this particular locality. The few birds which remained after my arrival apparently departed on the 16th of March.

During the latter part of February, 1894, about two thousand American Eiders had been living around Cape Poge, Martha's Vineyard, and what is new in my experience, large numbers of them frequented daily the Great Pond on Chappaquidic Island, M. V., to feed. They had undoubtedly observed the large numbers of Scoters which also frequented this pond to feed and followed their example. It may be interesting to know, in this connection, that those Eiders frequenting the north side of Nantucket, also for the first time in numbers, came into the harbor of Nantucket to feed. The cause in both instances was undoubtedly the better food supply. At Woods Holl, Mass., Mr. Vinal Edwards informed me that the American Eiders had again appeared in 1894, as in 1893, in very large numbers during the latter part of the winter, his estimate of their number being between four and five thousand birds, which daily frequented the

waters between Woods Holl and Naushon Island, Mass. On March 13, 1894, during a strong southwest wind, they all departed and were not observed afterwards. Mr. Edwards had saved the contents of the stomachs of some Eiders which were shot on February 11 and 15, which I saw; they consisted of sculpin spawn, in perfect condition, in small masses stuck together, and black mussels (*Modiola modiolus*) ground up to the consistency of fine sand and black in color. Four female King Eiders (*S. spectabilis*) were taken there on February 20, 1894, and the contents of the stomachs saved, which I also saw, consisted entirely of *Tritica trivittata* in good quantity and condition.

Such a very large collection of Eiders, in so restricted a locality as the one above mentioned, can only be explained by the great abundance of the black mussel which these birds first discovered in the winter of 1892-93. These beds of mussels had increased to such an enormous extent that some of them, which were attached one to another, are said to be five feet or more in thickness. Only such masses are able to survive under the peculiar conditions which exist there, due to the great pressure of water which rushes with great force through this narrow passage or strait, connecting Buzzards Bay with Vineyard Sound. When the birds were disturbed by the steamboats which passed daily they would fly out into the Sound, where they would remain awhile, returning later. Although considerably harassed, and many shot, it apparently produced little effect on them, for they refused to forsake so attractive a feeding ground, and continued to frequent it. I have little doubt that they will again appear in the same large numbers if the food supply continues in this locality next season.

No Brant (*Branta bernicla*) wintered around Muskeget Island during the winter of 1893-94. The first that were noted were five birds on February 15, 1894. In less than one week the number increased to fifty, and on March 12 there were between four and five hundred, the larger half of which had come in since March 8. I noticed considerable diminution in the food supply, many acres of the eel grass (*Zostera marina*) having been killed. There was still remaining large areas that was good.

Mr. Marcus W. Dunham of Tuckernuck Island informed me that on May 2, 1893, he saw a good many Red Phalaropes (*Crymophilus fulicarius*) between Muskeget and Tuckernuck Islands.

There have been a good many of the larger Scaup (*Aythya marila nearctica*) living about the waters between Muskeget Island, and Maddeket harbor, which is on the northern side of Nantucket Island. They also frequented the ponds at the western part of the latter island during the winter and spring of 1894, although there have been fewer there than there were last season during the same period. On March 11, 1894, some four hundred still frequented Maddeket harbor. I shot a male and female *A. affinis*, all I saw, on the 13th. They were in company with *A. m. nearctica*. There were still thirty of the larger variety in the Hummuck Pond, Nantucket Island, on April 29. They flew out at my approach, mounted to a very high altitude and went towards the west. I did not see them again.

Although I have shown by these notes that there have been very large bodies of wild fowl concentrated in restricted localities, I would add that I have rarely observed fewer in the localities they have heretofore been accustomed to haunt. I account for it by the scarcity in these localities of the shell-fish food, which they consume in enormous quantities.

I saw about twenty-five Red-breasted Mergansers (*Merganser serrator*) at Muskeget Island March 15, 1894. The height of their abundance in these waters is from April 1 to 10. Those birds which winter further south first make their appearance, a few, about the first of March; they are about all gone by the first week in May.

Six Sanderlings (*Calidris arenaria*) have been living in the vicinity of Muskeget Island, Mass., during the past winter.

Nantucket, winter of 1893-94. There have been about one thousand Scoters living in the upper harbor, coming in from the Sound in the morning to feed, and flying out again in the afternoon to roost. There have also been about one hundred and fifty Brant living in the harbor this spring. On May 1 there were about thirty Brant in Muskeget waters.

Mr. Marcus W. Dunham of Tuckernuck informs me that on May 2, 1893, he saw a flock of fifteen (*Charadrius squatarola*),

the first birds of the season, which were resting on Gravelly Island flats. On May 18 or 20 one hundred or more had collected on Tuckernuck Island and vicinity. They remained about one week. On April 18, 1894, at the westernmost part of Nantucket Island, seven birds were noted flying towards the west. On April 29 I saw two at the south head of the Hummuck Pond. One of them, a male, which I shot, was pretty evenly black and white on the breast; the other had apparently no black. On April 29, 1894, at Billingsgate Lighthouse, Welfleet, Cape Cod, Mass., the keeper, Mr. James P. Smith, saw two Black-bellied Plovers. These are *all* very *early* dates for spring birds in Massachusetts.

There were fewer Turnstones (*Arenaria interpres*) during the spring of 1893 than in 1892; they arrived at the same time as the Black-bellied Plovers, just as they did in the spring of 1892. They are close friends, and frequent the upland with the Plovers, as they do also by themselves.

Mr. H. G. Nutter of Boston, Mass., informs me that on April 15, 1894, he saw seven flocks of American Eiders off Welfleet, Cape Cod, Mass. There were five to seven in each flock. On the 20th he also saw three flocks, with three to five birds each. On April 18 he saw two flocks of Canada Geese (*Branta canadensis*), one had twelve birds, the other rather more; they were flying in a northwest direction. On the 21st he saw one flock containing eight birds, which appeared to be very tired. They settled down in Welfleet harbor to rest, it being late in the afternoon.

Seven Canada Geese (*Branta canadensis*) alighted in Ponkapog Pond, Mass., May 8, 1894. I am informed on good authority that more Canada Geese have passed over the eastern part of this State this spring than for many years. This is also the case for Nantucket Island.

There have been fewer Golden-eyes (*Glaucionetta clangula americana*) about Nantucket Island during the past winter than usual.

Through the courtesy of my friend Mr. J. R. Kendall of Jamaica Plain, Mass., I am able to contribute the following interesting data concerning the recent occurrence of the Red Phalarope (*Phalaropus lobatus*) off the coast of Massachusetts. On May 25, 1894, about ten thousand (as carefully estimated)

were observed resting on the water around the 'Pigs' (rocks, lying off Swampscott), occupying an area of about a mile radius. They were feeding on the red whale bait (brit) some of which was taken from them. I am informed that these birds follow the mackerel, which also feed on this brit, by their pursuit of which it is driven to the surface, and is then obtainable by the birds. I am also told that in the Bay of Fundy the Phalaropes so frighten the mackerel when they come to the surface in pursuit of the brit, that the fish sink themselves. To prevent this, the fishermen carry at times quantities of liver cut up, which they throw out to attract these birds and keep them away from the fish in order that they may be better able to capture the latter.

On the above date three hundred and eleven were shot off the 'Pigs,' fifty-six of which were obtained as the result of two discharges. Six of these birds were forwarded to Mr. Tufts, Lynn, Mass., and six others to Mr. Welch of Salem, Mass., both taxidermists. The remainder were not preserved. All of those sent to the above gentlemen proved to be Northern Phalaropes, and were all females. There is every reason for believing that this entire body of birds were of this species. This gathering of birds appears to have been the largest ever noted in this vicinity. I understand they were also observed in large numbers at Annisquam at about the same time.

On May 30, with the wind south and fresh, my friend Mr. J. R. Kendall observed two thousand (estimated) around the 'Pigs,' where they were still lingering, the others having departed. They kept up a continual twittering. He again visited the same locality on June 3, at my request, and sailed over the adjacent water, but failed to observe any birds, all having apparently departed. On that day the wind was west, a fresh breeze. The day before the wind was strong southwest.

I am inclined to the belief that *Phalaropus lobatus*, as also *Crymophilus fulicarius*, exist in enormous numbers, owing to the fact that they seldom approach the shores in numbers, or pass over the land to any extent, as far as I am aware, during their migrations. They consequently are not subject to the contingencies which affect other birds. It will be recalled that a very large flight of Red Phalaropes (see Auk, Vol. IX,

1892, pp. 294-298) occurred in 1892, greater in fact than had heretofore been recorded. None similar has taken place since, so far as I know. Yet one hundred miles north of Cape Hatteras, N. C., and fifty miles from land, Phalaropes abound in countless myriads in May.

STATEN ISLAND CROWS AND THEIR ROOSTS.

BY WILLIAM T. DAVIS.

ABLE-BODIED Crows do not roost on Staten Island in winter, but fly as night approaches to better protected retreats in New Jersey. In ordinary winters five or six hundred visit the island daily, and generally repair to the South Beach where they find a considerable store of food, in the fish, crabs, and other dead creatures that are cast ashore. As the afternoon wears away, the Crows fly westerly from the beach, and congregate on the salt meadows along Fresh Kill, on the opposite side of the island. If these meadows are covered with snow, they assemble in the trees, or in some upland field, which is more likely to be bare. Here, with additions to their number from other parts of the island, they hold a convention, and gradually, by twos and by threes, and in small flocks, fly either along the Kill out to the Sound, or diagonally across Long Neck to New Jersey, to a roost that lies north or northwest of Staten Island.

Many afternoons have been spent in watching the Crows at Long Neck and elsewhere on the island, and a few specific observations will be offered as evidence here, though a more detailed account is to be found in the Proceedings of the Natural Science Association of Staten Island, for May 12, 1894.

Sunday, December 24, and Christmas day, 1893, were both very mild; there was a warm wind and no snow on the ground. On these occasions several hundred Crows gathered on the salt meadows in the afternoon, near the head of the main branch of

the Fresh Kill. On the 24th it was cloudy and showered occasionally and the Crows commenced flying to New Jersey at 3 P. M. The 25th, on the contrary, was a bright sunny day, and the first Crows did not start until 3.30 P. M. On this last occasion I counted 303 Crows flying over at right angles to the Turnpike and thence over Chelsea and Dongan Island, like a long straggling caravan following an aerial highway.

They do not take exactly the same path always; occasionally some follow the Kill, as has been stated above, and those that fly across the Neck are governed considerably by the direction of the wind. One blustery day in February Mr. Walter Granger and I watched the first Crows fly over the Neck, drop close to the fields in order to avoid the force of the north wind, and finally fly along Chelsea Creek to New Jersey. The birds that followed flew by a more circuitous route, keeping among the scattered timber and thus avoiding the full strength of the gale.

Again, all of the Crows that fly westward from the beach do not cross Long Neck or follow the Kill to the roost situated north or northwest of the island, but a few continue along the high ground from Annadale to Kreischerville, and are apparently bound for a roost that lies beyond the Raritan. On calm days they may be watched for miles with a glass, as they fly sky high on their journey.

In the severe winter of 1892-93, Crows not only came from the New Jersey roosts already mentioned, but they also came to the South Beach from the roost at Sandy Hook. They went long distances for food and no doubt many died. Mr. Robert Ridgway, in 'Science' for February 10, 1893, tells of the sufferings of the Crows in a roost near Washington, D. C., stating that many had their eyes frozen, which was followed by the bursting of the organs and the death of the birds from starvation.

On the afternoon of the 22d of January, 1893, many Crows were noticed near the foot of New Drop lane. Some of these birds flew westward in the direction of Fresh Kill, while several hundred flew over the water to Sandy Hook. The chief departure was about 4 P. M. At fifteen minutes past four they had nearly all gone, but I observed a few belated individuals fly boldly from the Staten Island shore near the light house, without any rest previous to undertaking their long journey. Thus many

of the Crows that were walking together on the beach flew in opposite directions as the afternoon wore away, and roosted in widely separated parts of New Jersey.

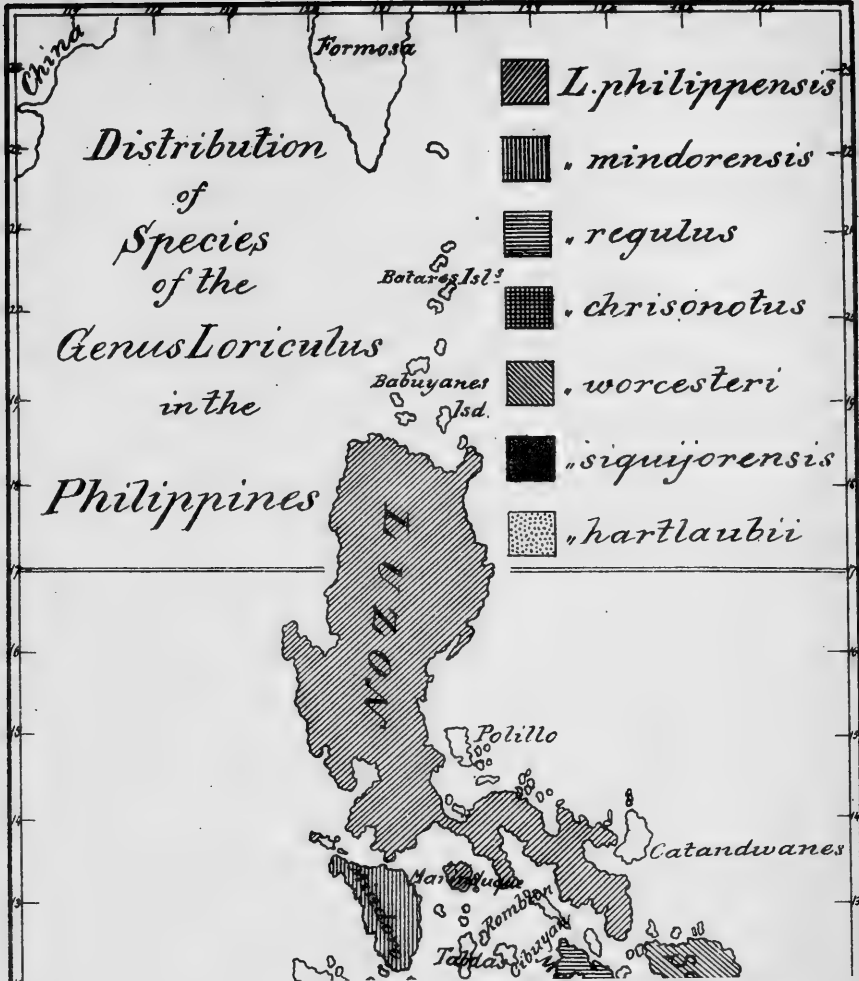
The Rev. Samuel Lockwood, writing of the evergreen groves on Sandy Hook, in the 'American Naturalist' for August, 1892, says: "Here are rookeries of crows which almost blacken the air as they return in the evening from their daily foraging." As far as my observation extends it is only in very cold weather that they continue their flight to Staten Island and its store of food on the South Beach.

In spring the Crows return to the island to roost, and mostly fly at evening in two directions, namely, toward Old Place on the North Shore, and toward the woods at Annadale. Of course many build nests and live for a time apart, but as early as April and May, flocks of Crows that have no family cares may be seen at evening about these warm weather roosts and as the season advances the numbers are greatly increased.

At Old Place there is a long ridge of slightly elevated land in the salt meadow, on which stands a thick growth of deciduous trees, and it is in these and in the immediate vicinity that the Crows have the smaller of their warm weather roosts. I have seen them congregate at this place in the late afternoons every summer since 1889, chiefly in a large, dead tree that towers above the surrounding growth, which tree is also used by the Bitterns that occupy the same woods during the day and sally forth on their nightly fishing excursions about the time the Crows come home to roost.

The majority of the Crows that frequent the island in warm weather may be seen flying in late afternoon toward the Annadale woods. They come from the beach, and from all directions, and congregate in the broad open fields near the woods where they have had a warm weather roost for many years. On August 6, 1893, a flock, by count, of over three hundred Crows had gathered in these fields, and many more were in the woods near by, and others constantly arriving. At dusk the Crows in the field flew to the woods. All of them did not roost in a few trees close together, but were scattered about the vicinity in small assemblages.

On the 27th of November, 1892, I found only a small flock of about forty Crows remaining in the Annadale roost. At dusk







they were making considerable noise, uttering a variety of strange notes, many of which were subdued and conversational. When it was quite dark I crept on hands and knees into the woods, which consisted mainly of young oaks, to within about forty feet of the Crows, when suddenly one sounded an alarm, and the others flew from the low trees without uttering a sound. They lit only a few yards away, but scattered in their flight, and the Crow who did the cawing lit in the next tree from that used as a roost.

The Annadale woods was visited on the 11th of December, 1892, and on the 23d of December, 1893, for the purpose of observing whether the Crows frequented them at that season, but though a few flew by, all were found to be on their way to New Jersey.

It will be seen from the above that Crows visit Staten Island in winter from two, and sometimes in severe seasons, from a third New Jersey roost, and that in summer they occupy principally two warm weather roosts on the island itself.

THE DISTRIBUTION OF GENERA AND SPECIES OF NON-MIGRATORY LAND BIRDS IN THE PHILIPPINES.¹

BY J. B. STEERE.

IN THE years 1887 and 1888 a party from the University of Michigan visited the Philippines for the purpose of scientific exploration. During this visit several important facts relating to the distribution of birds in these islands were noticed. As one island after another was explored, it was found, as was to be expected, that most of the genera of birds were continually recurring, thus giving a general similarity to the bird fauna of all the islands.

¹ Read before the American Association for the Advancement of Science at Indianapolis, August, 1890.

Each genus was ordinarily represented by but a single species in a place, so that the number of species and the number of genera in any one locality were nearly equal. This resulted from the fact that in a large number of genera the islands possessed but a single widely distributed species of each, and that in a large number of other genera, though each genus existed in the islands in several species, each of these species occupied a limited area of its own made up of one or more adjacent islands. In this limited area it existed by itself, sharply separated from the other species of the same genus.

This reappearance of genera in new specific forms in each distinct area was so frequent with a large number of them that the members of the party learned to expect and to look for local species of these whenever a new island was reached.

On making a study of the distribution of the genera and species of birds collected by the party in these islands on our return to the United States, the facts above noticed were found to be further reaching and of more importance than was at first supposed, and to point to a law of distribution which, if established, must have great influence upon the theories for the creation of species.

In this study only the collections made by the members of the party have been used. Great care was taken with these in noting the exact place of collection, sex, color of eyes, etc., while with many collections formerly made from the islands it was supposed sufficient to label them as from the Philippines.

About five thousand specimens of birds were collected by the party, belonging to nearly or quite four hundred species. These were collected on seventeen distinct islands of the group, which were chosen from their size and location as representative of the whole.

These collections, while not comprising all species known from the islands, are so nearly complete that any just conclusion drawn from their study must be accepted as truth, which further exploration will only strengthen.

The general arrangement followed has been that of Lord Walden and of Prof. R. B. Sharpe, in their published lists of Philippine birds. The names of genera and species have been made to agree generally with those given in the 'Catalogue of

the Birds of the British Museum,' as far as the volumes of that work had been issued when this paper was first prepared.

The land birds of the Philippines collected by the expedition, as far as identified, belong to one hundred and fifty-six genera, and number three hundred and twenty-four species.

Of these, six genera (List A), — *Lanius*, *Motacilla*, *Anthus*, *Lozustella*, *Acrocephalus*, and *Phylloscopus*, — with twelve species, are migratory as regards part or all of their species found in the Philippines, and have been left out of the study, though the non-migratory species of these seem to be distributed according to the same law governing the other resident birds.

There are left one hundred and fifty genera and three hundred and twelve species of resident land birds. Of these, seventy-five genera were found represented in the Philippines by single species each. These are as follows:—

LIST B.

Cacatua	Chrysococcyx	Copsychus
Accipiter	Hierococcyx	Clinacteris
Lophotriorchis	Dasylophus	Chalcostetha
Spizaëtus	Lepidogrammus	Corone
Pernis	Pyrrhocentor	Acriotheres
Butastur	Dryococcyx	Calornis
Haliaëtus	Anthracoceros	Sturnia
Haliastur	Artamus	Sarcops
Elanus	Lalage	Gracula
Microhierax	Buchanga	Padda
Pandion	Muscicapa	Mirafra
Polyoaëtus	Rhipidura	Passer
Bubo	Eumyas	Treron
Scops	Culicicapa	Carpophaga
Strix	Pratincola	Myristicivora
Tiga	Abrornis	Ptilocolpa
Harpactes	Cryptolopha	Hemiphaga
Eurystomus	Xanthopygia	Ianthænas
Alcedo	Dasyrotropha	Chalcophaps
Macropteryx	Dendrobiastes	Calœnas
Chætura	Ægithina	Geopelia
Batrachostomus	Micropus	Gallus
Lyncornis	Merula	Megapodius
Cacomantis	Monticola	Excalfactoria
Chalcococcyx	Geocichla	Turnix

These are, to a great extent, large and long-winged species of Hawks, Owls, Cuckoos, Starlings, Pigeons, etc., which may pass readily from island to island; a number being extended over the whole archipelago, and some species reaching the adjacent countries. A few of them are Bornean genera, apparently lately introduced into Paragua, which have not had time to become more widely distributed through the archipelago, and in some cases have hardly as yet formed distinct species. Examples of these are *Pernis*, *Tiga*, *Buchanga*, *Ægithina*, and *Gracula*. A few are Philippine genera, differentiated as yet into single species only, or having formerly existed in more species they have been reduced to their present state by the great changes of area and other conditions to which the islands are subject. Such are the genera of Cuckoos, *Lepidogrammus*, *Dasylophus*, and *Dryococcyx*, the Starling *Sarcops*, and the curious Timeline form *Dasycrotopha*. It is probable that a few genera of this list, among them *Scops*, *Batrachostomus*, and *Megapodius*, will be found to have more than one species in the islands. In this case they will fall into List C, and will in no sense weaken the conclusions of this paper.

In fifty-three genera, with one hundred and fifty-three species, each genus is represented in the Philippines by two or more species, each of which exists in a limited area of its own, sharply separated by sea channels from the similar areas occupied by the other species of the same genus.

These genera, with the number of species of each found occurring in the archipelago, are as follows:—

LIST C.

Prioniturus, 4.	Xantholama, 2.	Hyloterpe, 4.
Cyclopsitta, 2.	Caprimulgus, 2.	Pericrocotus, 2.
Loriculus, 7.	Surniculus, 2.	Dicurus, 4.
Spilornis, 3.	Eudynamis, 2.	Siphia, 2.
Falco, 2.	Centrocoocyx, 3.	Philentoma, 2.
Thriponax, 4.	Buceros, 3.	Zeocephus, 3.
Mulleripicus, 3.	Craniorrhinus, 2.	Setaria, 2.
Chrysocolaptes, 5.	Penelopides, 6.	Broderipus, 2.
Yungipicus, 4.	Artamides, 5.	Oriolus, 4.
Pelargopsis, 2.	Edoliisoma, 3.	Erythropitta, 2.
Atenoides, 3.	Pseudolalage, 2.	Macronus, 2.

Mixornis, 3.	Parus, 2.	Corvus, 2.
Ptilocichla, 3.	Sitta, 2.	Sarcophanops, 2.
Chloropsis, 2.	Zosterops, 4.	Oxyerca, 3.
Irena, 4.	Prionochilus, 3.	Munia, 2.
Poliolophus, 4.	Æthopyga, 4.	Macropygia, 2.
Pycnonotus, 2.	Arachnothera, 2.	Phlogœnas, 2.
Cittocinclla, 3.	Anthothreptes, 2.	

Future observations will probably remove *Falco* from this list to the one which follows. Professor Sharpe does not recognize the genus *Broderipus* in the Oriolidæ, nor the genus *Actenoides* among the Kingfishers. If these genera are thrown out the species placed under them will also fall into the following list. Several of these genera, among which are *Caprimulgus*, *Surniculus*, *Eudynamis*, *Erythropitta*, *Pycnonotus*, *Parus*, and *Sitta*, possess but two Philippine species each, one of which inhabits the islands of Paragua and Balabac on the west, while the other species is quite generally distributed over the remaining islands.

Perhaps one of the most characteristic genera of List C is *Loriculus*, the small, green, blue-winged and red-rumped Parrots. This genus exists in seven species, which have the following distribution: *L. philippensis* occupies the islands of Luzon and Marinduque; *L. regulus* the islands of Panay, Guimaras, Negros and Masbate; *L. mindorensis* the island of Mindoro; *L. chrisonotus* the island of Cebu; *L. worcesteri* the islands of Samar and Leyte; *L. siquijorensis* the little island of Siquijor; and *L. hartlaubii* the islands of Mindanao and Basilan. The western islands or Paragua and Balabac seem to lack the genus altogether. Though some hundred and fifty specimens of this genus were procured, in no case were individuals of two species found inhabiting the same island, though the straits separating islands were in some cases very narrow. This is notably so with the islands of Negros and Cebu, occupied respectively by *L. regulus* and *L. chrisonotus*. These islands approach each other so closely at the straits of Dumaguete that the outlines of houses and trees can be readily made out across them.

The genus of small Hornbills, *Penelopides*, with six species, is another good example of the method of distribution of species in this list. *Penelopides panini* inhabits Guimaras, Panay,

Negros, and Masbate; *P. manillæ*, Luzon and Marinduque; *P. affinis*, Mindanao; *P. basilanica*, Basilan; *P. samarensis*, Samar and Leyte; and *P. mindorensis* the island of Mindoro. The western islands seem to lack this genus also.

In seventeen genera, with seventy-four species, each genus is represented in the islands by several species: two or more of which may be found inhabiting the same island; but the species thus found together, with the same generic name, differ greatly in size or coloring or other structures and belong to different natural sections or subgenera.

These sections or subgenera themselves may each be represented in the archipelago by several species; but where this occurs each species is found isolated and separated from all the other species of the same subgenus, just as are the species of the genera given in List C. These genera, with the number of species of each, are the following:—

LIST D.

Astur, 2.	Hypothymis, 4.	Cinnyris, 7.
Ninox, 4.	Cyanomyias, 2.	Ptilopus, 3.
Merops, 2.	Hirundo, 3.	Phabotreron, 6.
Ceyx, 6.	Iole, 6.	Osmotreron, 2.
Halcyon, 5.	Orthotomus, 8.	Turtur, 2.
Collocalia, 2.	Dicæum, 10.	

Authors have already attempted in several cases to raise the natural sections of these genera to generic rank.

Whenever the birds of two sections of one of the genera named above differ greatly in size, the species of the section of larger, longer-winged birds will be more widely distributed than the smaller birds of the other; one of the larger species being able to extend itself over the areas of several of the smaller forms. The genus *Ninox* is an example of this. *Ninox lugubris*, a large, long-winged, long-tailed form, seems to be distributed over the whole archipelago, while the other section of smaller, short-tailed birds, of which *Ninox philippensis* is an example, contains at least three species, — one found in the south, one in the central islands and the other in Luzon. The genus of Ground Pigeons, *Phabotreron*, is another example of this method of dis-

tribution, the larger, *Phabotreron amethystina*, apparently extending over the areas of the other five smaller species.

The distinct conditions under which these subgenera exist together were frequently apparent even in our hurried visit. The species of Bee-birds, *Merops*, were quite closely observed. The two species, *M. bicolor* and *M. philippinus*, probably exist together on every island of the group. *M. bicolor* is social, hundreds sometimes feeding together, in groves and forests, at a height of fifty to a hundred or more feet from the ground. They appear to be closely limited to honey bees as food. They were found nesting semi-socially in dry, nearly level ground, into which they burrowed several feet. This was in the island of Marinduque in May, 1888. *M. philippinus* is solitary in habit and feeds near the ground in open country, where it perches on posts and on bushes. Its food, as far as observed, was wasps and dragon-flies. It was not observed nesting.

The species of the genus *Ceyx* were found to vary greatly in their habitat. There were the woodland Ceyxes, *Ceyx melanura* and its allies, always found away from the streams and in the forests, and the river Ceyxes, *C. cyanopectus* and *C. argentata*, as universally found along the streams.

Three species, of three subgenera, of so-called *Halcyon* were found generally distributed over the islands together. These were *H. gularis* (Entomobia); *H. coromanda* (Callialcyon); and *H. chloris* (Sauropatis). None of these frequented the water; *H. gularis* being found in open plains feeding from the ground, or perched in low trees; *H. coromanda* in low, thick undergrowth in forests, and *H. chloris* quite generally near the sea beach and often in open coco groves about the coast villages.

The maroon-backed *Osmotreron* is arboreal, feeding in the high trees in flocks. *Osmotreron vernans*, on the other hand, inhabits thickets, where it feeds from the bushes or the ground, and is found singly or in pairs.

There remain five genera and ten species in which two species of the same genus were found existing together in the same islands, these not differing enough to appear to warrant placing them in distinct sections of the genus.

These genera, with the number of species of each found in the islands, are the following:—

LIST E.

Melanopitta, 2.
Criniger, 2.

Megalurus, 2.
Cisticola, 2.

Tanygnathus, 2.

Even here there seems to be no case in which the two species of the same genus found existing together are so closely allied that they may be supposed to have been derived from a common form in the area in which they now occur. They usually differ considerably in size or coloring, and in the case of *Cisticola* and *Megalurus*, the only genera in which both of a pair of species were observed, there was a sharp distinction of habitat noticed. *Cisticola exilis* inhabited the low, open, level rice fields of Luzon, and *Cisticola cisticola* the wooded hills. *Megalurus ruficeps*, where it occurred with *M. palustris*, was found in the waste places inland, which had grown up to high, coarse grass, while *M. palustris* was found close along the beach in open grassy places.

The relative abundance of the two species is worth noting in the case of *Melanopitta* and *Tanygnathus*. *Melanopitta sordida* is the common form found everywhere and always abundant, while of *M. steerii* our party found but one specimen in Mindanao in a six weeks' stay, and another in Samar. *Tanygnathus luconensis* again is the common form found everywhere abundantly, while but a single specimen of *T. everettii* was ever seen. Our collections seem to show that *Melanopitta sordida* occurs alone through most of the islands, but with *M. steerii* in Mindanao and Samar; also that the large *Megalurus palustris* alone occupies the northern and western islands, the smaller species, *M. ruficeps*, the central islands, while the two species inhabit Marinduque together.

It seems probable that *Melanopitta* and *Tanygnathus* are examples where two species of a genus, after having arisen in different areas, have then been thrown together after they have just come to differ too much to fuse, while they still remain almost identical in habits and foods, and so are brought into such conflict that the weaker species is disappearing.

Putting Lists B and C together, there are one hundred and twenty-eight genera out of one hundred and fifty, and two hundred and twenty-eight species out of three hundred and

twelve, in which each genus is represented by but a single species in a place. This is about thirteen-fifteenths of the whole number of genera and five-sevenths of the whole number of species; altogether too great a proportion of both to have no significance.

If we add to Lists B and C List D, there results one hundred and forty-five genera out of one hundred and fifty, and three hundred and two species out of three hundred and twelve, or twenty-nine from every thirty of the genera and over thirty from every thirty-one of the species so distributed in the islands that no two species nearly enough allied to be put in the same section or subgenus are found existing in the same island. These three lists teach the same law of distribution, and the difficulty in formulating it is not in the facts but in the necessary imperfection of the terms used in measuring the values of the various natural groups of animals. The fact that these natural groups vary in value indefinitely makes it forever impossible to so measure them by the fixed rule of species and genus that all men shall be agreed.

The law of distribution of non-migratory land birds of the Philippines may be stated as follows:—

The genus is represented by but a single species in a place.

Or, in more general terms, as follows:—

No two species near enough alike structurally to be adapted to the same conditions will occupy the same area.

The varieties or subspecies of birds in the Philippines, wherever observed, follow the same law of distribution as the species; the varieties of a species, if any, each existing in neighboring but distinct areas. The great Bronzed Pigeon, *Carpophaga anca*, has the bronzed shading of the back much deeper in the specimens from Basilan than in those from the central and northern islands, while those from Paragua have the wings much bluer in color. The Red Woodpecker, *Chrysocolaptes xanthocephalus*, from the central islands, has more red on the throat in the bird from Masbate than in the one from Panay and Negros. The Cockatoo and Racquet-tailed Parrot of Mindanao are decidedly smaller than the same species in the other islands. Other examples of the same kind are numerous, and there appears to be a tendency in every species to form as many varieties as it

inhabits distinct islands with separating sea channels broad enough to make the passage over difficult and infrequent.

The above facts make Philippine species and varieties geographical or local groups depending upon local causes for their existence. They show *isolation* to be the first and the necessary step in the formation of species.

The foregoing facts make the belief in the fusion of closely allied species, when thrown together, almost necessary. The volcanic character of the islands and the shallow seas separating them, with the observed marks of frequent changes of sea level, make it necessary to believe that the land areas of the Philippines have been continually varying and that, in multitudes of cases, closely allied species have been thrown together by the connection of islands formerly distinct. These closely allied species now no longer existing together, they must have disappeared either by the destruction of one or by their fusion. To one who has observed the likeness in size and coloring and notes and food of these allied forms, the latter is the only reasonable hypothesis for the greater number of cases.

A satisfactory explanation of many or most of the phenomena of distribution of genera and species in larger and continental areas may be found in giving the same prominence to isolation and fusion in the formation of the species occupying them.

RECENT LITERATURE.

McIlwraith's Birds of Ontario.¹—The first edition of Mr. McIlwraith's excellent manual, 'The Birds of Ontario,' published in 1886 (see Auk, IV, 1887, p. 245), was speedily exhausted, so that for some years past the

¹ The | Birds of Ontario | being a concise account of every Species of Bird | known to have been found in Ontario | with a | Description of their Nests and Eggs | and Instructions for collecting Birds and preparing | and preserving Skins, also Directions how | to form a Collection of Eggs | By Thomas McIlwraith | Member of the American Ornithologists' Union | — | Second Edition—Enlarged and Revised to Date | With Illustrations | — | Toronto | William Briggs, Wesley Buildings | Montreal: C. W. Coates Halifax: S. F. Huestis | MDCCCXCIV—8vo., pp. i-x, 11-426.

work has been unobtainable to many who desire to consult its pages. It is therefore with great pleasure that we welcome this valuable handbook, revised to date, much enlarged, and in a dress more befitting its scientific importance and popular interest. In place of the introductory essay 'On Birds and Bird Matters' of the first edition, we have here a few pages on the general subject, with special reference to migration, followed by a dozen pages of directions as to how to collect and prepare specimens for the cabinet.

The species treated number 317 as against 302 in the first edition, to which nearly 400 pages of the work are formally devoted, giving about a page and a quarter to each species. The technical, descriptive portion of the text is printed in small type, the biographical in much larger type. The whole has evidently been carefully revised, and much new matter added to the biographies, which in many instances have been to a large extent rewritten, the recent literature of the subject having been placed under contribution. As the author himself says: "In the present edition, it has been my object to place on record, as far as possible, the name of every bird that has been observed in Ontario; to show how the different species are distributed throughout the Province; and especially, to tell where they spend the breeding season. To do this, I have had to refer to the notes of those who have visited the remote homes of the birds, at points often far apart and not easy of access, and to use their observations, published or otherwise, when they tend to throw light on the history of the birds observed in Ontario." Credit is of course duly given for the information thus obtained.

As ornithologists well know, the author of the 'Birds of Ontario' is well equipped for his task, and, as would be expected, has done his work well, the second edition being fully abreast of the subject, the few faults of the first edition having been corrected, and the more important recent discoveries in the field here covered being duly incorporated. The text is illustrated with numerous cuts, though none of them appear to be here for the first time published. An excellent portrait of the author forms a fitting frontispiece to the volume, which will doubtless prove a boon to the bird lovers of Ontario and adjoining Provinces and States.

We notice that the last bird given — inserted as an addendum — is the Black-capped Petrel (*Estrelata hasitata*), the record being based on a specimen found dead near Toronto, Oct. 30, 1893. This is of interest as making the third inland record for this species during the autumn of 1893, one having been taken at Blacksburg, Va., Aug. 30, 1893 (see Auk, X, p. 361), and another at Oneida Lake, N. Y., Aug. 28, 1893 (Auk, XI, p. 162). We have private information of the capture also of a specimen in Vermont at about the same time. Doubtless these occurrences of this little known sea-bird so far inland have some relation to the great cyclone of August 26-27, which proved so disastrous to property as well as bird life on the coast of South Carolina (cf. Wayne, Auk, XI, p. 85).—J. A. A.

Sharpe's Catalogue of the Fulicariæ and Alektorides.¹—In volume XXIII of the British Museum 'Catalogue of Birds,' embracing the two orders Fulicariæ and Alektorides, Dr. Sharpe has given us a most welcome contribution to systematic ornithology. The subject is treated with his usual ability and care, and of course after the stereotyped method of former volumes of this invaluable series. The family Rallidæ is considered as consisting of 187 species, distributed among 61 genera (the latter including several now extinct). The other families are comparatively small, numbering collectively 65 species, of which 30 belong to the family of the Bustards (Ottidæ) and 19 to the Cranes (Gruidæ).

A feature of the volume is the large number of recently new generic names introduced, proposed and first published mainly within the year 1893 by Mr. Sharpe in the Bulletin of the British Ornithologists' Club. In addition to these (10 in the family Rallidæ alone) various groups usually treated as subgenera are here raised to full generic rank. Among the latter, as regards North American birds, are *Coturnicops* Bon. (recently 'emended' into *Ortygops*), and *Creciscus* Cab. *Limnogeranus* appears as a new generic name for our Whooping Crane, while *Ionornis* Reichen. is treated as a synonym of *Porphyryla* Blyth, our Purple Gallinule thus standing as *Porphyryla martinica*. As regards species and subspecies, *Rallus heldingi* is considered as a subspecies of *R. elegans*; *R. scottii* is made a synonym of *R. saturatus*, the latter, together with *crepitans* and *obsoletus*, being treated as subspecies of *R. longirostris*. Of forms extra-limital to the A. O. U. Check-List, *R. coryi* is made a synonym of *caribæus*, the latter also standing as a subspecies of the *longirostris* group. We infer from this that Mr. Sharpe has never seen *R. coryi* (his three specimens of *caribæus* are recorded as from Jamaica). *R. longirostris cubanus* Chapman is entered in the 'Addenda,' and in the 'Systematic Index,' as a subspecies of *longirostris*, as described. A closely related South American form of *R. virginianus* is separated specifically (and figured) as *R. æquatorialis*. All of the American forms of *Gallinula* being referred to *G. galeata*, the habitat of this species is given as "the greater part of the New World," while, following Stejneger, *G. sandwichensis* is also recorded as a subspecies of *galeata*. The Andean *G. garmani* is considered as "a fairly distinguishable race," but, it is added, "if the Chilian and Bolivian bird is recognized as a race, the West Indian bird will have to be admitted as a subspecies also." As a matter of fact, however, the differences presented by the latter are trivial in com-

¹ Catalogue of the Fulicariæ (Rallidæ and Heliornithidæ) and Alektorides (Aramidæ, Eurypygidæ, Mesitidæ, Rhinochetidæ, Gruidæ, Psophiidæ, and Ottidæ) in the Collection of the British Museum. By R. Bowdler Sharpe. London: Printed by order of the Trustees. Sold by Longmans & Co., 39 Paternoster Row; B. Quaritch, 15 Piccadilly; Dulau & Co., 37 Soho Square, W.; Kegan Paul & Co., Paternoster House, Charing Cross Road; and at the British Museum (Natural History), Cromwell Road, S. W. | 1894. = Catalogue of the Birds in the British Museum, Vol. XXIII. 8vo., pp. i-xiii, 1-353, pll. i-ix.

parison with those which separate *garmani*, in which, in Lake Titicaca specimens, the length of the wing runs up to 9.10 inches, with an average of 8.50, — a difference one-fourth to one-third of the total length of the wing in average *galeata*, combined with much darker coloration and a great reduction in the amount of white. In West Indian and Bogota specimens there is very little reduction in size from average *galeata*, but the frontal shield is larger, the back darker and less olive, and the front of the tarsus more or less strongly tinged with red—the latter a feature sometimes seen in Florida specimens. While we should not deem it advisable to name the West Indian form, the case is very different with the Andean form, although it may grade into *galeata*.

According to the characters given for the separation of the subspecies of the *Aramides cayanae* group, of six Trinidad specimens (all females), collected by Mr. Chapman, two would be referable to *A. cayanae* and four to *A. cayanae chiricote*, in these last the hinder part of the crown and nape being strong rufous brown, instead of gray. This feature is thus shown to be variable in specimens from the same locality, independently of either sex or season. The species and subspecies described apparently for the first time in the present work are: *Rallus aquatorialis* (figured, pl. ii); "*Limnopardalus rytirhynchus*, subsp. β . *Limnopardalus vigilantis*" (figured, pl. iv); *Aramides gutturalis* (figured, pl. v); *Porzana galapagoensis*; "*Corethura elegans*, subsp. α . *Corethura reichenovi*"; *Grus liflordi*.—J. A. A.

Elliot's Monograph of the Pittidæ.—Part III, dated February, 1894¹, contains the following species: *Eucichla guiana*, *Pitta lorix*, *P. steerii*, *P. concinna*, *P. rubrinucha*, *P. nepalensis*, *P. kocki*, and *P. celebensis*. Figures are given of the young birds in first plumage, as well as of the adult male and female, in two of the species (Blue-tailed Pitta, *Eucichla guiana*, and the Nepal Pitta, *P. nepalensis*), and there is also some account of the habits of these species. While the sexes are alike in coloration when adult, the young in first plumage are almost as different as possible from the adults. The Blue-tailed Pitta's nest is built in bushes six or eight feet above the ground, and is ball-shaped; the Nepal Pitta nests on the ground, while the Celebes Pitta (*P. celebensis*) nests "in a hole dug in the slope of a river bank." The eggs are in each case white, spotted and streaked with dark markings.—J. A. A.

A Bird-Lover in the West.²—A desire to widen the circle of her feathered friends has led Mrs. Miller further afield and in 'A Bird-Lover in the West' she gives us the results of her studies in Ohio, Colorado, and Utah.

¹ For notice of Parts I and II, see Auk, XI, pp. 62 and 173.

² A Bird-Lover in the West. By Olive Thorne Miller. Boston and New York. Houghton, Mifflin & Company. The Riverside Press, Cambridge, 1894. 12mo., pp. i-vii, 1-278.

This volume shows no diminution of the enthusiasm so characteristic of the previous works of this author and, giving evidence of increased descriptive powers, possesses an interest which must appeal not alone to the ornithologist but also to those who cannot claim even a passing acquaintance with birds.

Indeed the reviewer can instance the case of a reader who, though unable to recognize three species of birds in the field, on chancing to pick up this little volume, was so fascinated that he eagerly read to the end.

As accurate records of painstaking, conscientious work, Mrs. Miller's observations have permanent scientific worth, but it is as a voice teaching the beauties of bird-life that her words have their chief value. She does not tell us what she has read or heard of, but what she has seen, and she does this so attractively that it will be strange indeed if among her readers there be not some who will be induced to go afield and find for themselves that nature is one great inexhaustible volume whose charms no writer can adequately portray.

That Mrs. Miller appreciates the necessity of accuracy is evident, and we regret to see, therefore, that her careful work should be marred by obvious errors in identification. Thus the Towhee found breeding at Colorado Springs was probably *Pipilo maculatus megalonyx*, not *P. erythrophthalmus*; the Horned Lark seen there in June was doubtless *Otocoris alpestris arenicola*, not the more boreal *Otocoris alpestris lucolama*, while the Hummingbird recorded from the same locality as *Trochilus colubris* may have been *Selasphorus platycercus*. Again, the Grackle of Ohio is the Bronzed, not the Purple, variety.—F. M. C.

The Birds of Kentucky.¹—This is an unfortunate addition to the number of faunal lists by compilers who have a very limited knowledge of birds and less of the literature of ornithology. The author states that it is based on observations and collections made in various parts of the State "since July, 1889," and adds that "the original list, as thus prepared, has been extended by including species observed by Audubon [and] by Beckham in Spencer [*lege* Nelson] County." It appears that about one-half of the 253 species given have been included on the authority of these ornithologists.

The author ignores trinomials and thus commits the error of giving such European species as *Certhia familiaris*, *Loxia curvirostra*, *Corvus corax*, etc., a place in the Kentucky fauna, while *Turdus aonalaschkw*, *T. ustulatus*, *Peucaea aestivalis* and others are introduced in the same way. "*Sylvania* (?) *microcephala* Ridgway" and *Dendroica carbonata* Audubon are evidently admitted as species which may have claims to recognition, and *Aphelocoma floridana* is given on the basis of its having "said to have been taken in Kentucky."

¹A Preliminary List of the Vertebrate Animals of Kentucky. By H. Garman, Lexington, Ky. Bull. Essex Inst., XXVI, 1894, pp. 1-63. Birds, pp. 7-33.

The author is apparently not familiar with Pindar's 'List of the Birds of Fulton County, Kentucky,'¹ which contains some twenty-one species not mentioned in the present list. In the present state of ornithological knowledge there is no excuse for work of this kind, and it would have been better, not alone for the reputation of the author, but for the cause of science, had he submitted his manuscript to a competent reviser. The author's conservatism in excluding species for which he had not at least some record and placing them in a separate list of 'Additional Species which may occur in Kentucky,' is the only thing to be said in his favor.—F. M. C.

Cherrie on Costarican Birds.²—This paper is based on collections and observations made in southern Costa Rica from November, 1891, until April, 1892. It enumerates 199 species, 14 of which are new to the apparently inexhaustible avifauna of Costa Rica. Of this number four species are considered as new to science; three of these have been characterized in previous papers, while one, *Henicorhina pittieri*, is here described for the first time.

The annotations under each species consist of a statement of the number of individuals collected at the various localities visited, remarks upon variations in plumage, and brief notes on habits and comparative abundance or rarity.—F. M. C.

Jouy on Central Mexican Birds.³—The late Mr. Jouy landed at Tampico, October 13, 1891, and proceeded to St. Luis Potosi, where he remained until the following January. He then continued his journey to Guadalajara where he was resident for seven months. From these two points he made numerous more or less extended excursions into the surrounding country, making collections and observations on which the present paper is largely based, though several species are included "which were collected at Guaymas, on the Gulf of California, and also a few from the mountains in Sonora, 32 miles south of the border town of Nogales."

This list numbers 111 species of which 11 are water-birds. *Catharus melpomene clarus* (Barranca Ibarra, Jalisco), *Psaltriparus melanotis iulus* (Hacienda El Molino, Jalisco), and *Spinus psaltria croceus* (Panama) are described as new forms, while *Basiluterus rufifrons jouyi* has been previously described by Mr. Ridgway.

¹ The Auk, VI, 1889, pp. 310-316.

² Exploraciones zoológicas efectuadas en la parte meridional de Costa Rica por los años de 1891-1892. I. Aves, por Geo. K. Cherrie. Taxidermista del Museo Nacional. 1893. San José de Costa Rica. Tip. Nacional. 12mo. pp. 1-59.

³ Notes on Birds of Central Mexico, with Descriptions of Forms Believed to be New. By P. L. Jouy. Proc. U. S. Nat. Mus., XVI, 1894, pp. 771-791.

The annotations are brief but interesting and are supplemented by detailed notes on the colors of the irides, bill, feet, etc., based on comparison of the fresh specimen with the plates in Mr. Ridgway's 'Nomenclature of Colors.' Though sadly handicapped by failing health Mr. Jouy's love of his favorite pursuit showed no diminution, and the material for this, his last paper, was gathered under conditions to which most naturalists would have succumbed.—F. M. C.

Verrill on the Birds of Dominica.¹—Mr. A. H. Verrill collected in Dominica during March, April, and May, 1890, and was joined by his brother, the author of this paper, "the latter part of April." As a result of their combined ornithological researches in several parts of this wild and rugged island he presents a well-annotated list containing 54 species, including 5 species not given by previous writers, thus raising the number of Dominican birds to 64. *Geotrygon mystacea*, of which no specimens were preserved, has since been procured by the writer of this review from a local collector.

Several other species are included on the descriptions of natives or as observed but not collected, and although it is quite probable these species actually occur, a little more conservatism in this direction would have been advisable. *Vireo calidris*, given as "very likely" a summer visitor only, was found by the reviewer to be a common bird during the past February.

Interesting notes on habits and local distribution are presented, but by far the most valuable part of this paper consists in observations, many of them entirely new, on the nesting of twenty species of Dominican birds, among which *Falco columbarius* is included. Half-tone figures of the nests of seven and eggs of three of these are given. It appears that in Dominica the breeding season is nearly over by the latter part of April, at which time it is approaching its height in Trinidad. The difference in time, however, is apparently not a real one but is due to the limitations of the Dominican avifauna. In Trinidad the nearest representatives of the twenty species found breeding by the Messrs. Verrill, so far as known, also breed before May 1, but many others have not then begun to nest.

Mr. Verrill does not seem to be familiar with Colonel Feilden's important paper on 'The Deserted Domicile of the Diablotin in Dominica.'²—F. M. C.

¹ Notes on the Fauna of the Island of Dominica. With lists of the species obtained and observed by A. H. and G. E. Verrill. By G. E. Verrill. Trans. Conn. Acad., VIII, 1892, pp. 315-359, pl. i-iii. List of Birds obtained and observed, with Notes on their Habits, Nests, and Eggs, pp. 319-351.

² Trans. Norfolk and Norwich Naturalists' Society, V, 1889, pp. 24-39.

Raine's Bird-Nesting in North-West Canada.¹—From what we can gather this work has not as yet come into the hands of many of our professional ornithologists, nor has it up to the present time been reviewed in the pages of 'The Auk.' It is an octavo volume of about two hundred pages, and its illustrations consist in the main of six colored plates of eggs of birds (61 species), together with numerous lithographs of birds, scenery, and heads of mammals, and a variety of text-cuts. Both the colored and uncolored lithographs were drawn upon stone by the author himself, so he is wholly responsible for them. Apparently Mr. Raine spent the month of June, 1891, in the Manitoban region, and the present book is a running narrative of his doings there during that time. From the 'Preface' we learn that though "the title of the book would lead readers to expect the work to be purely Oölogical, it will be found to treat on matter not strictly Ornithological. I have branched off and given descriptions of the habits of the more important animals inhabiting the region traversed, and have also given a description of the scenery between Toronto and Vancouver. . . . I have given accurate descriptions of the birds' eggs, and also given their measurements. . . . The book does not describe all the species which inhabit the Northwest, for many common species known to be summer residents were not even observed, and the songs of many warblers, vireos, sparrows, and other small birds were heard in the bluffs and along the wooded streams, but I could not recognize the species."

It is evident from all this that Mr. Raine claims for his book, first, a popular descriptive part; and secondly, a scientifically accurate oölogical part. We propose only to concern ourself with the latter, and that as briefly as possible. We would hardly even be expected here to take our author's ludicrous figures of birds and their nests into consideration, for both space and our time are altogether too valuable to be squandered in any such manner. Judging from its unfeathered tarsi, his figure of a Golden Eagle, for example, evidently does not represent that bird, and it may be cited as an average specimen of the work of this thoroughly unreliable artist.

We turn first then to the six colored plates of the eggs. None of these are numbered *on the plate*, and as the figures *on each plate* run 1, 2, 3 and so on, it renders it impossible to refer to any particular specimen either by number or plate. Personally, I have compared many of these colored drawings with large series of eggs of the species they are supposed to represent, and we may say, as a rule, they are, in the matters of outline, coloring, and measurements, highly inaccurate, and can in no way be depended upon.

Lastly, this work is so pregnant with statements in regard to nests and eggs of birds which Mr. Raine alleges to have either seen or taken in

¹ Bird-Nesting in North-West Canada. Walter Raine. Illustrated. Hunter, Rose & Co., Toronto: 1892.

the region visited, that one stands quite aghast as he reads them. These statements in no way agree with the experiences of other naturalists who have gone carefully over the same ground, nor do they agree with what has been published in the premises. We very much question the statement that "The Rusty Grackle is common between Winnipeg and Portage-la-Prairie, usually making its nest on the ground like a song sparrow" (p. 112). I am inclined to think that our author has confused the Rusty Grackle with Brewer's Blackbird. In a similar manner he has probably confused the Northern Shrike with the White-rumped Shrike, and the statement that the "great Northern Shrike breeds plentifully around Crescent Lake, Assiniboia," would appear to be vouched for by the author of this book alone.

What Mr. Raine says about the breeding of the Evening Grosbeak is also characterized by a certain amount of looseness and conjecture. We are told "This species breeds in the Northern Rocky Mountains, but its eggs are almost unknown in collections and consequently very valuable. It is reported as a common resident in the forests of Washington Territory. A nest of four eggs, on the point of hatching, was found in Yolo County, California, May 10, 1886, but could not be preserved. These eggs are said to be similar to those of the Black-headed Grosbeak."

Finally, it will be interesting to oölogists to know that Mr. Raine, on two or three occasions, collected the eggs of the Little Brown Crane in this region. We wonder if they were not the nests and eggs of the Sand-hill Crane that Mr. Raine met with? This surmise would appear to present the true facts in the case, in as much as, so far as our author's account of his next visit to this region has been given us (*The Nidologist*, Jan. and Feb. 1894), he says never a word about finding any more nests and eggs of the Little Brown Crane, but speaks with confidence about Sand-hill and Whooping Cranes breeding throughout many parts of the country he explored.

In addition to his own personal collecting, we understand Mr. Raine is a very extensive purchaser of eggs from collectors in many other parts of the world; and he also keeps out a corps of his own paid collectors. Such practices require great caution, as there are collectors and collectors, and birds' eggs and birds' eggs. From a scientific point of view, a bird's egg is valueless unless its identification is absolutely sure. Published oölogical works are likewise scientifically valueless if the statements they contain are rested upon accounts that cannot be verified beyond all peradventure of a doubt. If Mr. Raine hopes to build up a solid reputation as a perfectly reliable avian oölogist, he should constantly keep before his mind the hints we have, with all kindness, endeavored to give him in this brief review of his 'Bird-Nesting in North-West Canada.' Let him apply these hints to the next volume he has already promised us, and not only will the lay reader look with interest for the coming out of his books, but they will also be welcome additions to the library of the scientist.

—R. W. S.

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GENERAL NOTES.

Northern Phalaropes off the New Hampshire Coast.—While taking my new boat the 'Phalarope' from Rockaway, Long Island, N. Y., to Casco Bay, Maine, I met with numerous flocks of Northern Phalaropes, twenty miles off the New Hampshire Coast, August 9, 1893. I was running my course for Cape Elizabeth and found on coming within sight of land that they disappeared.—REGINALD I. BRASHER (*in letter to WILLIAM DUTCHER*).

Turkey Vulture in Eastern Massachusetts.—Mr. H. W. Page of Boston called my attention some time ago to a Turkey Buzzard (*Cathartes aura*) which was taken in Weston, Massachusetts, early in April, 1893, and I visited the bird April 5, 1894. Mr. Samuel Smith, who has a farm in the western part of the town of Weston (about fourteen miles west of Boston), shot the bird there, merely breaking its wing. He has kept the bird ever since out of doors in a netting cage about five feet square with a box to retire to, having one side open; he has fed the Vulture on raw fish, raw beef, muskrats, etc., and the bird appeared to me to be in very good condition, except for the general condition of its plumage and the fact that the broken wing set in such a way that it is held at an unnatural angle, slightly elevated.—FRANCIS BEACH WHITE, *Cambridge, Mass.*

Obliteration of the Tarsal Scutella in *Accipiter cooperi* in Texas.—The daring sallies of this species often costs it its own life, but I have never known it to chase a barnyard fowl through an open window and under a bed, as is recorded¹ of the Goshawk.

December 5, 1893, sitting by my window I heard a scream from my child outside and on looking through the window saw her sitting on a hen-coop with a Cooper's Hawk making repeated swoops at the young chickens in the coop. The child was feeding the fowls through an opening and some of the food had fallen outside; at this the weaklings were picking when the assault was made. The chickens took shelter in the coop and the marauder perched in a lone tree in a field some two hundred yards away. Calling to my son, whose horse was standing saddled at the gate, he rode out and brought down the Hawk as it sought safety in flight.

On taking the bird in hand I at once saw that I had a specimen with *fused tarsal scales*. Having noted Dr. Coues' record² that such a state had not been observed in *A. cooperi*, I at once began an investigation by writing to sundry ornithologists in position to have information upon this subject. The result of this investigation goes to show that the word *fusion* is rather out of place when applied to certain Texan examples, as the scales are not only fused but so much obliterated as to be indistinguishable under a hand lens. After I had learned that the lines of the individual scutella were obsolete in at least two specimens I had collected in Cooke County, Texas, I became more pointed in my interrogations, in some instances questioning my correspondents a second time (no doubt to their annoyance) on the subject.

Following are some of the replies as to *fusion* in northern and eastern specimens:—

"None of my other specimens (I have large series) show complete fusion, but in several the divisions between the scales are not at all distinctly marked."—W. B., Dec. 23, 1893.

"I would say that to the best of my recollection I have never seen nor heard of a specimen of *Accipiter cooperi* in which the tarsal scutella were fused."—R. R., Dec. 11, 1893.

"Replying to your inquiry of the 16th the tarsal scutella of adults of *A. cooperi* and *A. velox* are normally fused."—F. M. C., Dec. 22, 1893.

Below I quote some replies relative to the obliteration of the lines marking the divisions between the individual scales:—

"Most of my adult Massachusetts Cooper's Hawks show distinct scales on the tarsus. In one or two they are somewhat indistinct, but in no case quite obsolete."—W. B., Cambridge, Mass., Jan. 24, 1894.

"As I wrote you previously in answer to the same question *Accipiter*

¹ Hatch, Birds of Minnesota, p. 184.

² Birds of the Northwest, p. 335.

cooperi NEVER (as far as my observation goes and I have examined many) has "the lines separating the tarsal scutella obliterated."—R. R., Smith. Inst., Feb. 5, 1894.

"We have quite a number of adult *Accipiter cooperi* in the Museum, but none show the fusion of the tarsi so complete as to have the lines of the individual scales *obliterated*."—H. Nehrling, Milwaukee, Wisc., April 28, 1894.

"*Accipiter cooperi*, No. 756, Collection University of Minn., ♂ ad., Minneapolis, Minn. Scutella of tarsi completely fused but showing distinct transverse markings or furrows where the scales come together. Not fused near the tarso-metatarsal joint."—T. S. R., March 10, 1894.

It will thus be seen that incomplete *fusion* occurs in Massachusetts, *complete fusion* in Minnesota, and *obliteration* in Texas. Mr. Wm. Brewster *implies* obliteration in a specimen I sent him from this region. In my earlier notes my records do not discriminate between *fusion* and *obliteration*, and the specimens (if preserved) have passed from my hands. The following entries are from my notes:—

"Nov. 5, 1885. One shot from my front gate post. Scales of tarsi *fused*.

"March 2, 1887. D. F. Ragsdale shot one with scales of tarsi *fused*.

"Feb. 28, 1889. ♀ ad., Gainesville, Tex., Coll. Wm. Brewster, state of fusion complete; obliteration implied in epistle.

"Dec. 5, 1893. Ad. ♀ shot with tarsal scutella obliterated; moulting rectrices. Coll. G. H. R."

I should state that the *obliteration* in the specimen now in my collection does not extend to the tarso-metatarsal scales.

It would be interesting to know what per cent. of adult specimens from Texas have the transverse lines obliterated. It would be still more interesting to know the *cause* of such disappearance.—GEORGE H. RAGSDALE, *Gainesville, Texas*.

[The variance in the views expressed by Mr. Ragsdale's correspondents seems to depend upon the definition of the term 'fused.' Mr. Ragsdale himself clearly appreciates the difference between 'fusion' and 'obliteration' of the tarsal scales but he evidently did not emphasize this difference in making his inquiries.

In quite young specimens of *Accipiter cooperi* the tarsus is distinctly scutellate, the scales, especially those at the distal extremity of the tarsus, being more or less imbricated.

In adults the scutella are fused on partially ankylosed and the tarsal envelope then becomes entire. In none of our sixteen adult specimens, however, have I observed the complete obliteration of the lines of fusion, or change from a scutellate to a booted tarsus which Mr. Ragsdale reports, though in several examples, notably one from New Jersey, the outlines of the scales are nearly obsolete.—FRANK M. CHAPMAN, *American Museum of Natural History, New York City*.]

The Barn Owl (*Strix pratincola*) in Northern Vermont.—A male Barn Owl was killed in a barn in Lyndon, Vt., June 4, 1894, and bought by a gentleman in St. Johnsbury. The measurements of the bird were as follows: Length, 16.50; extent, 45.00; wing, 14.00; tail, 5.50; bill, 1.00; tarsus, 3.75. Its plumage was light in color and upon skinning, it was found to be very thin and muscular as though it had led a hard life.

The first known occurrence of a Whip-poor-will (*Aurostomus vociferus*) in this town was noted on May 5. They are frequent ten miles south but have not been known here before.—MARTHA G. TYLER, *Curator of the Fairbanks Museum, St. Johnsbury, Vt.*

Observations on the Ruby-throated Hummingbird.—One 27th of May my son discovered a Hummingbird at work upon her nest, and drew for me a map of the locality by which I had no difficulty in finding the spot. It was well in the depths of an eighty acre forest. I watched my opportunity and while the bird was away for material succeeded in obtaining a desirable seat for observation. The saddle was already formed and the nest evened up to a platform level with the upper surface of the limb. It was placed beyond the middle of a long, slender maple branch about fifteen feet above the ground. The bird always followed the same direction whenever she went for material. Oftener than otherwise she returned laden to her nest in thirty-nine seconds after she left it—now and then more; once ninety seconds. I also spent much time there the 28th and 29th, and find the history of those days very similar to that of the 27th. Occasionally she took a vacation for food and rest; but those vacations were short. On May 30, at two P. M., the cup was complete and the bird was carrying silk and lining it. For this material she would be gone about as long again as for that of the outside. The next day, May 31, she was sitting. During incubation she sat lightly on her nest a few minutes, then off as many, and looked brightly about her while on her eggs.

On June 8 I found my bird in trouble; another female Hummingbird was trespassing. The aggressor would hover over the nest, swoop back and forth above it like a pendulum, alight with a tantalizing gesture on a twig close beside it, or, with a squeal, dart under it, and each time she came near would get driven away by the sitting bird. Twice I saw her rob the nest, once of lichens from the outside and once a good bill-full of silk from the lining. The poor mother came back to her eggs as often as she was disturbed. After watching the constant conflict for more than two hours, I left them still battling. The next day the nest was unoccupied. During all these thirteen days—I had spent much time in close observation—I did not once see a male Hummingbird in the vicinity of the nest. It was the female who did all the labor of nest-making and of incubation and who, as long as she could, valiantly defended her eggs and property. In my chosen seat I was not more than twenty feet from

the nest and entirely unhidden; yet the bird paid no more attention to me than she might had I been a part of the tree I very quietly leaned against.

I once saw a female Hummingbird gather lichens from the body of a beech tree. She held herself poised before it, darting upon it again and again, until she had in her bill all she wished to carry.

About nine o'clock one spring morning, when lilacs were in bloom, we discovered that the old lilac bush by the well was 'swarming' with Hummingbirds—just come; we knew they were not there a few minutes before. There are five large lilacs on our premises and those of a near neighbor. On investigation I found four of these bushes alive, as it were, with Hummers—all females. The fifth bush, a Persian, they did not favor. The Persian lilac, with its slender, lithe branches and great, drooping clusters, is very beautiful when in bloom, but its flowers lack the sweetness of the common species. Then, all the time, there were birds in the air constantly coming and going from bush to bush. They remained the greater part of the day. I spent much time standing within one of those bushes. The birds seemed not in the least disturbed by my presence. There were seldom less than ten and often fifteen of them about the particular bush I was occupying. Every now and then one would alight and sometimes would pass her long tongue back and forth through her bill to free it from pollen. In the afternoon a male Hummingbird occasionally came to the flowers but was invariably driven away by the females. Towards evening the flock, apparently undiminished in numbers, disappeared as abruptly as it had appeared in the morning. On the following day the Persian lilac was still in its native purple, but the beauty was gone from the other four bushes; the flowers were a dull copperas color.

Once again I fell in with a wave of migrating Hummingbirds. These were in the eighty-acre forest and this time all males. These were not in a close flock as before, but were very plentifully spiced throughout the forest.

In a neighbor's orchard a Hummingbird sucked juice from an apple while a young girl was in the act of paring it.

Once, on one of my rambles, I stopped to talk with a friend in her garden. A stalk of double velvet marigolds, broken over the day before, drooped upon the ground. I suppose decay had set in, yet, as the flowers were still tolerably bright, I carried them with me when I resumed my walk. While pausing at a cornfield a Hummingbird, leaving the corn blossoms, came and leisurely fed from the marigolds in my hand, inserting its bill between the outer petals of the flowers.

I (and others also, no doubt) have found it a very common thing for Hummingbirds to be hovering and apparently feeding in the vicinity of dead branches—branches checking in the summer sun. Are they not feeding upon something attracted by decaying limbs,—insects invisible to our eyes?—JANE L. HINE, *Sedan, Ind.*

The Bobolink on the Coast of South Carolina.—I regret the misapprehension of my meaning that led to the criticism in the last number of 'The Auk,' p. 179, and the possible inference that I am careless as to my statement of facts. I intended simply to say that the Bobolink in the interior of the State (Chester County) was abundant only in the spring. It did not occur to me that the expression would be interpreted differently, as abundance on the South Carolina coast, in the northward as well as the southward migration, belongs to the common stock of ornithological knowledge of which I could hardly be supposed to be ignorant.—
LEVERETT M. LOOMIS, *Tryon, N. C.*

An Ingenious Pair of House Finches (*Carpodacus frontalis*)—It is generally believed that birds construct their nests year after year and generation after generation after the same plan. There are few observers, however, whose experience does not furnish illustrations of the fact that individual birds are capable of departing from the nest building methods acquired by inheritance, and of resorting to new and ingenious expedients. The following is a case in point, and I am much mistaken if the reader does not conclude that the nest-builders in question possessed a considerable degree of reasoning power as well as of ingenuity.

A pair of California House Finches (*Carpodacus frontalis*) built a nest in the corner of the piazza of a country store. So tame and confiding have these pretty Finches become that I am persuaded that the larger proportion of their nests are built, not in trees and bushes as formerly, but in all sorts of odd nooks and crannies about the house and barn; and even when they are compelled by the lack of facilities to resort to bushes and shrubbery, they choose those as close to the house as possible.

The pertinacity with which the House Finch clings to a chosen nook about a house when their nests are destroyed is amazing, and is equalled only by the English Sparrow. I have known five nests with their contents to be destroyed one after another, and each time the same pair set to work with apparent unconcern to build anew.

But to return to my nest. The proprietor of the store called attention to it, suggesting that if it was of any use to me I had better take it as he was about to destroy it for the reason that the finches were an unmitigated pest in the orchard. This statement, I grieve to say, there is too much reason to believe is true. And great is the pity, for its beautiful song, domestic habits, and pretty plumage give it a place occupied by no other American bird.

Viewed from below, the nest was seen to be balanced rather than firmly placed upon a narrow joist, and I was at a loss to comprehend how it was maintained there even in calm weather, to say nothing of the high winds that prevail in this locality. By means of a step-ladder I was soon able to solve the problem. Having about one-half finished the structure, the birds evidently recognized the insecurity of its position, and the location being in every other respect eligible they hit upon the following remedy.

Procuring a long piece of white string they carried one end well into the body of the nest and twined it around several sticks. Thence it was carried out like a guy rope to a nail that chanced to have been only half driven home, about six inches beyond the outer rim. Two turns were taken about the nail and the string then passed back to the nest and firmly interlaced with the twigs. The nest was then completed.

The string thus attached protected the nest from pitching forward—though the wind rocked it continually—while the wall protected it behind.

The work was not so deftly done as not to betray the novice in the weaving art, and a yearling Oriole might have smiled at the crude effort to steal its trade by its thick-billed relative. However, the evident purpose of *Carpodacus* was to tie down its nest so that it would stay, and appearances were but a secondary consideration. That the nest was securely anchored was evidenced by the fact that it contained five eggs upon which the female was peacefully setting quite regardless of the fact that it was within three feet of the head of every passer by.—H. W. HENSHAW, *Witch Creek, San Diego Co., Cal.*

Leconte's Sparrow (*Ammodramus leconteii*) in large numbers near Charleston, South Carolina.—Since the capture of this bird on January 26, 1886, and again on February 9, 1888, I have failed to detect the presence of this erratic Sparrow until December 6, 1893, when I shot an example in fall moult near Mount Pleasant. The next day I secured six specimens which were all in different stages of moulting. The moult was a slow one and it was not completed until January 15.

From December 6, 1893, to January 24, 1894, I secured forty individuals and could have obtained many more if I had had more time. They were to be found directly on the coast in 'broom grass' fields, which were quite boggy owing to long spells of rainy weather. The majority were shot on wing, but several were shot from the tops of live oak trees where they sought refuge after being repeatedly flushed from the ground. From the whole series only seven males were taken, the remainder being females.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Taming a Chipping Sparrow (*Spizella socialis*).—In the spring of 1891 a Chipping Sparrow built its nest in a honeysuckle vine which covers a stairway and balcony to my studio. It was begun while I was absent from home for a few days, and was on the railing just at the head of the stairs. I therefore avoided the balcony as much as possible until one egg was laid, using an inside entrance from the house.

I then began the experiment of taming the birds, standing for long periods in the doorway until the mother bird would at last go back and forth quite freely to the nest, and would sit upon it while I was there, at a distance of perhaps four feet.

Soon I tried sitting upon the top steps of the narrow stairs, which brought my head on a level with the nest, and it was not long before she also tolerated my presence there. I was so near that we sat and looked into each other's eyes.

I kept crumbs scattered about the balcony, which both birds ate, and then put them on my outstretched hand, and accustomed her to seeing that, held first from the doorway, and daily nearer to the nest, till at last I could hold it close beside her, and she would venture to take a crumb or two. And then one day, out came the tiny creature on to my hand! She did so frequently after that, and was also quite ready to take the crumbs from between my lips, while she sat upon the nest, and would let me stroke and cover her with my hand. But after the eggs were hatched, of which there were only two, she was not so tame.

During all this time the male bird never became very familiar, only hovering occasionally about the nest while I was near, and eating the crumbs from the balcony.

I anticipated when the young birds flew having the whole family return daily to at least breakfast there, but a week passed without my being able to identify one of them, though I made advances to every 'Chipping-bird' I came upon, hoping to receive some sign of recognition.

At the end of that time we had a succession of rainy days, and in one of them hearing a chattering going on outside my door, I looked out, and on the balcony, in the pouring rain, sat side by side two fat ragged young Chippies, while the mother bird went busily from one to the other, feeding them with dry crumbs, which were not three feet away in the shelter of the door, where they could easily have helped themselves.

That was the last I ever saw of them. But the nest remained and was still there the following February. There had been warm days which brought a few Bluebirds, but then followed a snow and ice storm which kept the trees and shrubs coated with ice for several days. We had watched a small flock of Bluebirds, in apparent distress, hovering about the house on one of the coldest of these days, and as night came on a number of them tried to find shelter under the eaves of my studio door, but flew away again. Just at sunset, however, one of them came back, and flew straight into the deserted nest! I watched until dark and he was still there, and I concluded that he spent the night.

Last spring we noted an interesting instance of devotion in a mother bird to her young. A Least Flycatcher built its nest in a half dead apple tree in our dooryard. We had a very hot day when the birds were only a few days old, and there being no leaves to shelter them, they evidently suffered from the heat, their heads hanging from the nest. We noticed later that the mother bird had taken a position just above them, and with outstretched wings was trying to shield them from the sun. She remained there for fully two hours, not even leaving them to bring food. When we saw that she also was panting with the heat, we decided to come to the rescue, and hoisted with a rake a grain bag over the nest for an awning. Immediately the male bird appeared, and both of them seemed to understand that all was well, and went busily to work catching insects for the young birds, who rapidly revived.—AMELIA M. WATSON, *East Windsor Hill, Ct.*

Kirtland's Warbler in Northeastern Illinois.—As a very welcome addition to the birds of this State, I am pleased to announce the capture here by myself on the 7th of May, 1894, of a *Dendroica kirtlandi*. The specimen, an adult male in slightly worn plumage, was taken among hazel bushes on the edge of a clearing. Beyond this, and the bird's excessive tameness, allowing an approach to within a few feet, nothing can be said that will increase our very meagre knowledge of the habits of this rare bird. While in the bushes it impressed me as being a straggler and away from more congenial surroundings.—B. T. GAULT, *Glen Ellyn, Ills.*

The Water Ouzel in the Coast Range south of Monterey, California.—In March, 1894, several pairs of Water Ouzels (*Cinclus mexicanus*) were found by Mr. J. Ellis McLellan, a field agent of the Division of Ornithology and Mammalogy, U. S. Department of Agriculture, in a deep, cool cañon about 20 miles south of Monterey, near a place called Sur. The shaded slopes of this cañon are still studded with the majestic redwoods (*Sequoia sempervirens*), while the western alder (*Alnus rhombifolia*) is common along the banks of the creek. The Ouzels were singing boisterously. The commonest bird at this season (March) was the Varied Thrush (*Hesperocichla nevada*).—C. HART MERRIAM, *Washington, D. C.*

The Mockingbird in Wyoming.—During the afternoon of May 10, I was collecting birds among the stunted cottonwoods and willow brush of Crow Creek about two miles east of Cheyenne, when I drove out a large gray bird which appeared from a distance to be an entire stranger to me. I chased it down creek a quarter of a mile, when it doubled on me and went back to the place from which I at first flushed it. I was unable to get near enough to kill with No. 12 shot, but was compelled to use a charge of No. 6, and at a distance of sixty-five yards, while on the wing, brought down my specimen. The bird proved to be *Mimus polyglottos* in fine plumage. Continuing down creek another Mockingbird was flushed from the willow brush but was too wild for me to capture it that evening, although I devoted a full hour to the chase, following the bird for a mile or more. The next morning, the 11th of May, I visited the same locality and found my bird again, but only succeeded in shooting it after stalking it, antelope fashion, by crawling prone upon the ground for sixty yards through stunted rose bushes. I succeeded in getting near enough, however, to shoot the bird with No. 12 shot. I have mounted both birds and placed them in the Cheyenne High School collection.

On May 23 while collecting about a half mile below where these two birds were shot, I heard a singer which I at first thought was a Brown Thrasher, but on listening I heard strange notes and at once concluded it was another Mockingbird. The singer was located in a clump of willows about forty yards from the creek, and an equal distance from the nearest

willow brush. I tried a charge of the small shot but did not reach him. He flew out and I killed him with No. 6 shot on the wing, the bird falling about seventy yards from where I stood. The individual killed on the evening of the 10th was a female and the other two were males. All were fat and their stomachs were well filled with worms and water grubs, larvæ, etc. Their feet were perfect in every way, the claws being sharp and showing not the slightest indication of having grasped the perch of a bird cage; and besides, the birds were exceedingly wild and shy. Then again cage birds as rare as the Mockingbird is in this latitude, and especially locality, do not go about in flocks, so, on the whole, I am satisfied that the birds came north with a flock of Brown Thrashers with which they were associating at the time I found them. I am not at all familiar with *Mimus polyglottos*, but one feature presented by the specimens captured appeared a little odd. The iris of the female was brown while that of both males was greenish yellow, much like the iris of *Oroscoptes montanus*, but not quite so yellow.—FRANK BOND, *Cheyenne, Wyoming*.

Bird Notes from Virginia.—The writer, in company with Messrs. C. W. Richmond and E. M. Hasbrouck, spent from May 14 to May 28, 1894, on Smith's Island, Northampton Co., Virginia, observing the bird life of that place. During our stay we identified sixty-two species of birds on the island, and noted a number on the adjacent mainland which were not seen on the island. The writer shot two females and one male *Tringa fuscicollis*, the first recorded instance of its occurrence in Virginia.

Terns, especially *Sterna antillarum* and *Gelochelidon nilotica*, seem to be rapidly diminishing in numbers, being far less common than I observed them on two previous trips in 1891 and 1892, when I was collecting in the vicinity of Smith's Island.

Tringa canutus was quite numerous, occurring in large flocks. May 25 hundreds of these birds were seen feeding along the extensive mud flats on the outer sea beach; some were in very highly colored plumage.

Ammodramus maritimus was breeding, and quite numerous; we secured forty-three specimens of this bird, and several sets of eggs.—EDWARD J. BROWN, *Washington, D. C.*

Connecticut Notes.—While collecting in a piece of thick woods near Greenwich, Fairfield Co., Conn., on the 25th of June, 1893, I found what at first appeared to be a nest of the Red-eyed Vireo, but which on closer inspection proved to be that of the Acadian Flycatcher (*Empidonax acadicus*). The nest contained three young several days old. The parent kept to the nest until I was within a yard of her, thus giving a good chance for identification. I think there are but two or three records of this species occurring in Connecticut.

On the 12th of July, while looking for *Helminthophila*, I took an adult female *H. lawrencii*. The bird is in every way like the female *H. pinus* excepting that the throat patch and stripe through the eye, which in the

male *H. lawrencii* are black, are in this specimen dusky olive-green. The specimen is quite similar to the one taken by Mr. H. W. Flint in New Haven several years ago.

The young in first plumage which this bird was attending when shot were in every respect typical *H. pinus*. The male parent was not found but I feel confident that it was *H. pinus*, as the young were well feathered and showed clearly the well defined black lores of the latter.—CLARK GREENWOOD VOORHEES, *New York City*.

Notes on Kansas Birds.—Mr. H. W. Menke, of Finney County, Kansas, at present a student in the University of Kansas, has noted in the county of his home four birds new to the bird fauna of Kansas. Finney County lies in the western and dryer portion of the State, and comprises chiefly high, dry plains. It is traversed by the Arkansas River flowing east from Colorado, but there is practically no timbered land in the county. The additions to the Kansas bird list are as follows:—

Carpodacus frontalis. HOUSE FINCH.—Five were taken by Mr. Menke out of a flock of fifteen on Jan. 5, 1892. The remnant of the flock was seen on the following day and again on the 7th. The birds were found about some stacks of alfalfa in a field of this western forage plant.

Piranga ludoviciana. LOUISIANA TANAGER.—A male was shot on May 20, 1893. On June 1, 1893, several pairs were seen in a small cottonwood grove in Kearney County (a county adjoining Finney).

Dendroica cærulescens. BLACK-THROATED BLUE WARBLER.—A male was taken in a deserted farm-house Oct. 17, 1891.

Hesperocichla nævia. VARIED THRUSH.—A single specimen was taken Oct. 17, 1891.

Mr. Menke has also taken in Finney County the Cinnamon Teal, the Red-breasted Merganser and the American Golden-eye, all rare Ducks in Kansas. A brother of Mr. Menke (Mr. G. G. Menke) took a set of nine eggs of the Black Rail (*Porzana jamaicensis*) on June 6, 1889. The Black Rail is a rare summer resident in Kansas. On April 23, 1893, Mr. Menke shot a Lewis's Woodpecker (*Melanerpes torquatus*), the second reported occurrence of this bird in the State. He also records the second occurrence of Clarke's Nutcracker (*Picicorvus columbianus*). Three birds were seen on Oct. 10, 1891. Mr. Menke also reports that the Pinon Jay (*Cyanocephalus cyanocephalus*) which Col. Goss in his 'Birds of Kansas' (1891) calls a rare visitant, with but one authentic record of occurrence, was a common winter resident up to 1891, appearing in large flocks in the autumns of 1889, 1890 and 1891.—V. L. KELLOGG, *University of Kansas, Lawrence, Kans.*

Temperature and Nest-building.—On or about March 1, 1894, I saw a Blue Jay pressing its breast upon a few twigs in the crotch of a large post-oak limb. This tree, standing almost directly in the path of my daily walks, was watched for some two weeks and no birds being seen nor any

material added to the nest, I supposed it was abandoned, and neglected to give it more attention. My surprise can be well imagined when on April 6 I saw both parents at the nest, and a good foundation for the nest laid. The first part of March was warm, the temperature rising at one time to 91° F. in the shade. Later in the month seven inches of rain fell, with much cloudy and some freezing weather. Twice the temperature fell to 25° and the leaves were killed. Up to date, April 6, it has not risen to 80° in this month.

That temperature may affect the time of nesting seems almost proven in this case, and yet a set of Crow's eggs taken April 2 was so far advanced in incubation that it was difficult to extract the embryo. A set of Plumbeous Chickadee's (*Parus carolinensis agilis*) eggs of same date were in advanced incubation; but as these birds build in holes and line with fur, they are well able to endure a sixty-six degree change of temperature. Will some one tell us what is the accepted opinion of oölogist concerning temperature affecting nidification?—G. H. RAGSDALE, *Gainesville, Texas.*

Change of Habits in our Native Birds.—It would be as interesting, from an evolutionary point of view, to note any change in the habits of an animal, any change in the way it adjusted itself to its environment, as to note the change in its bodily form or structure. It seems to me that such a change is taking place with the English Sparrow. A dozen or more years ago when these aliens first became a feature in our fauna it seemed probable that our native birds would soon be entirely driven from the neighborhood of our cities and villages. Our Robins, Bluebirds, Catbirds, Grossbeaks, Sparrows, Martins and the like were mobbed, driven from their food and nests and generally taught to believe, with Charles Sumner, that "life is a serious business." In this section, at any rate, a change has gradually taken place. Either our native birds have unexpectedly developed powers of resistance at first unsuspected or the pugnacity of the English Sparrows has diminished, for certainly our own songsters have not been driven away but on the contrary seem as numerous as they were twenty years ago. For the past two or three years, since my attention was first called to the matter, I have seen but little if any persecution of our native birds by the foreign Sparrows; on the contrary, our own birds are now often the aggressors, and if they do not indulge in persecution themselves, are adepts at defence. Very commonly a Jay, Robin, or Catbird will from pure mischief hustle a flock of Sparrows into desperate flight. In and about Rockford, Ill., a place of 30,000 inhabitants, the native birds have not been so numerous in twenty years as in the two or three years just passed. The conditions of the adjustment between the Sparrows and our commoner birds have changed to some extent, it seems. As has been noted before, the abundance of the Sparrows may serve to explain the increase in the numbers of the smaller birds of prey, — with us notably the Screech Owl.—F. H. KIMCOLL, *Rockford, Ill.*

NOTES AND NEWS.

PIERRE LOUIS JOUY, born in New York City February 8, 1856, died in Tucson, Arizona, on March 22, 1894, of consumption of the lungs.

It is with sincere grief that we make the announcement, for we can but illy spare from our ranks men of his stamp, men who devote their lives to the study of Nature from pure and unselfish love of her, men whose first aim is truth and the beautiful, and whose own self comes in only for second place. He was, moreover, a man of keen observation and of sound judgment, qualities which under more favorable circumstances would have insured him a prominent rank among his fellow-workers. Finally, he was a gentleman to the core, honest to a fault, conscientious as few, in brief, a man to be trusted and relied upon. And as he felt, so he spoke; indignant at injustice and sham pretensions, he was often severe in his condemnation of what he considered a wrong, sometimes to his own detriment, though that had no influence with him, for he was above simulating. It is needless to add that being of such a character he was a delightful companion and a faithful friend to those who were fortunate enough to possess his confidence.

Although his interests and work were scattered over a wide field, ornithology was, from an early day, his favorite study, and naturally enough his first interest centered around the birds of Washington, D. C., where most of his life was spent, an interest which gradually extended to those of our entire continent. But Professor S. F. Baird, one of whose devoted pupils he was, had use for him in other fields, and as an opportunity offered itself in 1881 he went out to China and Japan, where he made extensive zoölogical and ethnological collections for the Smithsonian Institution. His ornithological collections from Central Japan were particularly valuable, both on account of their richness and quality, and especially because of the full notes and important observations which accompanied them. The ornithological results were embodied in a paper published in the 'Proceedings' of the U. S. National Museum, VI, 1883, pp. 273-318, one of the most important contributions to our knowledge of the Japanese avifauna. From Japan he went to Korea temporarily attached to the United States Legation. At the capital he at once set to work to bring together one of the largest and most valuable collections of natural history ever made in that distant country, then nearly entirely unknown, collections which were afterwards enriched and completed during a sojourn of several years at Fusan while holding a position in the Chinese custom service of Korea. These collections, after his return to this country, were acquired for the greater part by the U. S. National Museum, and it was always his intention and fondest hope to be able to work up the splendid material which he had gathered, but the museum at first needed his services in other branches, and afterwards failing health, which

exhausted his strength and made it desirable to seek other climates, prevented the accomplishment of this desire. He went out again collecting, this time to Southern Arizona and Mexico, where, in spite of adverse circumstances, he continued his work and observations, helped by his faithful wife who shared the hardships and privations of these expeditions, till she finally closed his eyes in Tucson. The notes made during their stay in Mexico he was enabled to work up into a paper entitled 'Notes on Birds of Central Mexico, with Descriptions of Forms believed to be New' [see *antea*, p. 245], but he did not have the satisfaction of seeing it published, as it was not issued until shortly after his death (Proc. U. S. Nat. Mus., XVI, 1894, pp. 771-791).

Aside from the external circumstances which prevented him from publishing often, or voluminously, there were internal causes which impaired his literary productivity, viz., his artistic temperament and his varied interests in so many branches of science and art, which conspired against his becoming a narrow specialist. But this very thing made him so valuable a collector for others. He was not of the kind that gathers the stuff in by the bushel, or the ton, and to whom quantity is the first consideration, quality the second. He collected with discrimination; his preparation, particularly of the birds, was unexcelled; and his notes were full, to the point, and above all, reliable. Not until all the vast and varied material he gathered in so many lands has been worked up will it be fully appreciated how much science owes to the unpretentious, but honest work of Pierre Louis Jouy.—L. S.

WILLIAM C. AVERY, M. D., an Associate Member of the American Ornithologists' Union, died at Greensboro', Hall County, Alabama, March 11, 1894, at the age of sixty-two years. Dr. Avery was a graduate of Burlington College, Burlington, New Jersey, and later pursued his medical studies in both Philadelphia and Paris. He studied ornithology purely for the love of it, and his contributions to the science were by no means commensurate with his knowledge of it. His principal paper, published under the initials "W. C. A.", was entitled 'Birds Observed in Alabama,' and appeared in the 'American Field,' Vol. XXXIV, 1890, pp. 584, 607, 608; Vol. XXXV, 1891, pp. 8, 32, 55. It contains the results of many years' close observation and is the most important paper relating to the region of which it treats.

Dr. Avery's services to science, however, are to be reckoned by the assistance he gave fellow-workers rather than by his published writings. An appeal for information or specimens always met with a ready and enthusiastic response, and he sometimes made special trips to distant parts of the State to procure specimens requested by some correspondent.

Dr. Avery was a man of high classical and philological attainments and our journals attest his aid in solving some of the etymological problems which arise in zoölogical nomenclature.

DR. ALEXANDER THEODOR VON MIDDENDORFF, a Corresponding Member of the American Ornithologists' Union, died at his estate in Hellenorm, Liveland, Russia, Jan. 28, 1894, at the age of nearly 79 years. He was born at St. Petersburg, Aug. 18, 1815, and studied at Dorpat, taking his University degree in 1837. He afterward pursued his studies at the Universities of Berlin, Erlangen and Breslau, and later at the University of Kiew.

Dr. Middendorf is well known to naturalists everywhere for his great work, 'Reise in den äufßersten Norden und Osten Sibiriens' (four volumes, quarto, 1847-59), as remarkable for the erudition displayed as for the breadth of the field covered by his investigations. His other principal ornithological publication is his well-known 'Die Isepiptesen Russlands. Grundlagen zur Erforschung der zugzeiten und zugrichtungen der Vogel Russlands' (1855). He wrote also extensively on mammals and on mollusks.

DR. LEOPOLD VON SCHRENCK, a Corresponding member of the American Ornithologists' Union, died Jan. 20, 1894, aged 68 years. Dr. Schrenck is perhaps best known to ornithologists for his work entitled 'Reisen und Forschungen im Amur-Lande in den Jahren 1854-56,' in two quarto volumes, 1858-60, over 350 pages of volume I being devoted to birds. He was born at Dorpat, April 24, 1826, and at the time of his death was Director of the Ethnological Museum of the Royal Academy of Sciences at St. Petersburg. His name is naturally associated with those of two other celebrated Russian explorers and naturalists—Dr. von Middendorff and Dr. Gustav Radde—who at nearly the same time were exploring Asiatic Russia, and whose works may be well termed 'epoch-making' as regards the ornithology of this previously little known region.

'FOREIGN FINCHES IN CAPTIVITY,' by Arthur G. Butler, Ph.D., etc., is announced for publication in ten parts, royal quarto, with between 300 and 400 pages of text and sixty beautifully colored plates, the first part to be issued June 15, and the remaining parts at intervals of six weeks. The edition will be limited to 300 copies. The publishers are L. Reeve & Co., 6 Henrietta St., Covent Garden, London.

READERS of 'The Auk' will be interested to know that Mr. Charles B. Cory has recently sold his large collection of birds and his ornithological library to the Field Columbian Museum of Chicago, in which institution he has also accepted the Curatorship of the Department of Ornithology, which is to be entirely under his direction.

It may also be noted that Mr. William Brewster and Mr. Frank M. Chapman returned about May 1 from their trip to the Island of Trinidad, and the publication of the ornithological results of their work may soon be expected.



POINT PINOS JUNCO (JUNCO HYEMALIS PINOSUS).

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XI.

OCTOBER, 1894.

NO. 4.

POINT PINOS JUNCO (*JUNCO HYEMALIS PINOSUS*).

BY LEVERETT M. LOOMIS.

Plate VII.

POINT PINOS, the locality from which the type series of the Point Pinos Junco was secured, forms the southern headland of Monterey Bay, California. Its outer extremity is guarded by a number of rocky, bastion-like islets, against which the sea is continually battling. Passing crafts are warned from these dangerous rocks by a whistle buoy set far out in the deep water, and by a light situated some distance back from the shore on gently rising ground, which is largely overgrown with 'lupine.' The white light-house is a conspicuous object at sea, standing out in bold relief against the dark green background of Monterey pines that clothe a portion of the mountainous ridge that separates Monterey Bay from Carmelo Bay.

It was among these pines, June 21, 1892, on the light-house reservation that I first saw this Junco—a little company of old and young. They were feeding on the ground, but as I approached they flew into the pines. Their manner and notes

were suggestive of the Slate-colored Junco. During the two following months similar companies were found commonly distributed in the more open places throughout the pine woods. Though late in the season, I heard a number sing, and their songs recalled to my mind the eastern bird as I have heard it at the opening of the first song season during the early northward migrations in upper South Carolina.

The presence of the Point Pinos Junco in this region has long been a matter of record, but as comparison had never been made with specimens from the northwest coast and from the Sierras, its strongly marked characters remained unrecognized in nomenclature until January, 1893, when the writer set them forth in 'The Auk', under the name *Junco pinosus*. Since, the A. O. U. Committee of Nomenclature has ranked it as a subspecies, its name now standing as *Junco hyemalis pinosus*.

That a representative of the *Junco hyemalis* group and other birds of the Cold Temperate Subregion, as the Blue-fronted Jay, should be found breeding on this coast so far south at sea level is not surprising, owing to the peculiar climatic conditions prevailing. The mean temperature (according to local information) is about 60° F. during each of the summer months. Heavy fogs, that almost amount to rain, are also frequent during summer.

The Juncos reported as breeding at Santa Cruz on the opposite side of Monterey Bay and in the mountains of Santa Clara County probably belong to this race. It will be interesting to learn how far south along the coast and how far north in the mountains, in the typical form, its range extends.

A LIST OF THE BIRDS OF THE WET MOUNTAINS, HUERFANO COUNTY, COLORADO.

BY WILLOUGHBY P. LOWE.

TO ORNITHOLOGISTS, the avifauna of high altitudes may be said to always possess a peculiar interest on account of the light it throws on problems of geographical distribution. The following

is a list of all species known to me to inhabit the Wet Mountains, Huerfano County, Colorado, and is part of the result of visits of either long or short duration extending over a period of six years. The observations were made on the western slope, and extend for the distance of about eight miles along the range. The list, though probably incomplete, may be of some service as a furtherance of our knowledge of Colorado birds, and for comparison with Arctic and Alpine avifaunæ in general. All altitudes given are from sea level.

1. *Dendragapus obscurus*. DUSKY GROUSE.—This, the only Grouse found in the above named mountains, is quite common between the altitudes of 8,000 and 11,000 feet. They subsist largely on berries of *Arctostaphylos uva-ursi*.

2. *Columba fasciata*. BAND-TAILED PIGEON.—Abundant between 7,800 and 10,000 feet. The adults feed principally on acorns, whilst the young seem more partial to seeds.

3. *Zenaidura macroura*. MOURNING DOVE.—Common at 7,000; rare at 8,000; in one instance only have I observed it at 10,000 feet.

4. *Cathartes aura*. TURKEY VULTURE.—Frequently seen at 12,000 feet.

5. *Circus hudsonius*. MARSH HAWK.—Most abundant on the plains. I have, however, taken a specimen at 10,000 feet.

6. *Accipiter velox*. SHARP-SHINNED HAWK.—Quite common at 10,000 feet.

7. *Accipiter cooperi*. COOPER'S HAWK.—Not nearly so plentiful as the last. One was shot at 8,800 feet.

8. *Accipiter atricapillus*. AMERICAN GOSHAWK.—Fortunately for *Dendragapus obscurus*, this species is of rather rare occurrence. My highest record is only 9,000 feet.

9. *Buteo borealis*. RED-TAILED HAWK.—I once shot an adult male at 11,000 feet.

10. *Buteo borealis calurus*. WESTERN RED-TAIL.—More abundant than the last. Several specimens taken at 10,000 feet.

11. *Buteo swainsoni*. SWAINSON'S HAWK.—Not a common mountain bird. Breeds, however, as high as 10,000 feet.

12. *Aquila chrysaëtos*. GOLDEN EAGLE.—Not of infrequent occurrence at 11,000 feet.

13. *Falco mexicanus*. PRAIRIE FALCON.—Rare. One was shot at 10,000 feet.

14. *Falco columbarius*. PIGEON HAWK.—Several specimens were taken at 8,500 feet.

15. *Falco richardsonii*. RICHARDSON'S MERLIN.—I once shot an adult male at 8,000 feet.

16. *Falco sparverius*. SPARROW HAWK.—Common. Breeds at 10,000 feet.
17. *Bubo virginianus subarcticus*. WESTERN HORNED OWL.—Not very plentiful. One was shot at 10,000 feet.
18. *Megascops asio maxwelliæ*. ROCKY MOUNTAIN SCREECH OWL.—I once came across a family of the birds in some thick piñon trees at the altitude of 7,800 feet. They are quite common in the foothills.
19. *Glaucidium gnoma*. PYGMY OWL.—Common between the altitudes of 7,800 and 10,000 feet.
20. *Geococcyx californianus*. ROAD-RUNNER.—A rare mountain bird. One, however, was observed at 8,000 feet.
21. *Dryobates villosus hyloscopus*. CABANIS'S WOODPECKER.—Quite common at 10,000 feet.
22. *Dryobates pubescens orocæcus*. BATCHELDER'S WOODPECKER.—Found sparingly at 10,000 feet.
23. *Picoides americanus dorsalis*. ALPINE THREE-TOED WOODPECKER.—Several shot at 9,000 feet. Never observed below 7,500 feet.
24. *Sphyrapicus varius nuchalis*. RED-NAPE SAPSUCKER.—Breeds sparingly at 8,500 feet.
25. *Sphyrapicus thyroideus*. WILLIAMSON'S SAPSUCKER.—Abundant at 10,000 feet, and upwards.
26. *Melanerpes torquatus*. LEWIS'S WOODPECKER.—Breeds at 8,000, and frequently seen at 10,000 feet.
27. *Colaptes cafer*. RED-SHAFTED FLICKER.—Nidificates at 10,000 feet.
28. *Phalænoptilus nuttalli*. POORWILL.—Frequently heard and seen at 10,000 feet.
29. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.—Found throughout the summer at 10,000 feet.
30. *Micropus melanoleucus*. WHITE-THROATED SWIFT.—Tolerably common at 10,000 feet.
31. *Trochilus platycercus*. BROAD-TAILED HUMMINGBIRD.—Abundant. Breeds at 10,000 feet. Feeds chiefly on insects, especially small spiders.
32. *Contopus borealis*. OLIVE-SIDED FLYCATCHER.—Nests at 9,500 feet.
33. *Contopus richardsonii*. WESTERN WOOD PEWEE.—Occurs sparingly at 10,000 feet.
34. *Empidonax obscurus*. WRIGHT'S FLYCATCHER.—Tolerably common between the altitudes of 7,500 and 9,000 feet.
35. *Pica pica hudsonica*. AMERICAN MAGPIE.—Abundant in the fall. I have never shot specimens above 10,000 feet.
36. *Cyanocitta stelleri macrolopha*. LONG-CRESTED JAY.—Abundant at 10,000 feet and upwards.
37. *Aphelocoma woodhousei*. WOODHOUSE'S JAY.—Common at 6,000, scarce at 7,000, and never ascends over 8,000 feet.
38. *Perisoreus canadensis capitalis*. ROCKY MOUNTAIN JAY.—Several specimens were procured at 10,500 feet.

39. *Corvus corax sinuatus*. RAVEN.—Of frequent occurrence at 10,000 feet.
40. *Picicorvus columbianus*. CLARKE'S CROW.—Abundant at 10,000 feet.
41. *Cyanocephalus cyanocephalus*. PIÑON JAY.—This destructive bird is found at 9,000 feet, though I have no higher record.
42. *Coccothraustes vespertinus montanus*. WESTERN EVENING GROSBEAK.—I have observed these birds in the early fall at 10,000 feet.
43. *Carpodacus cassini*. CASSIN'S PURPLE FINCH.—I have shot specimens in the fall at 8,500 feet.
44. *Spinus pinus*. PINE FINCH.—Occurs at 10,000 feet.
45. *Junco caniceps*. GRAY-HEADED JUNCO.—Frequently taken at 11,000 feet, at which altitude it breeds yearly.
46. *Junco hyemalis shufeldti*. SHUFELDT'S JUNCO.—A common winter bird at 9,000 feet.
47. *Junco annectens*. PINK-SIDED JUNCO.—Abundant at 8,500 feet.
48. *Pipilo chlorurus*. GREEN-TAILED TOWHEE.—Breeds at 10,000 feet.
49. *Pipilo fuscus mesoleucus*. CAÑON TOWHEE.—Occurs sparingly at 10,000 feet.
50. *Habia melanocephala*. BLACK-HEADED GROSBEAK.—Several were seen at 10,000 feet.
51. *Piranga ludoviciana*. CRIMSON-HEADED TANAGER.—Breeds up to 10,000 feet.
52. *Tachycineta thalassina*. VIOLET-GREEN SWALLOW.—Tolerably common. Breeds at 9,500 feet.
54. *Vireo solitarius plumbeus*. PLUMBEOUS VIREO.—Several specimens were shot at 8,000 feet.
55. *Helminthophila celata*. ORANGE-CROWNED WARBLER.—Tolerably common. Rarely found above 8,000 feet.
56. *Dendroica auduboni*. AUDUBON'S WARBLER.—Common. Breeds at 9,500 feet.
57. *Dendroica townsendi*. TOWNSEND'S WARBLER.—Abundant during the fall migrations between the altitudes of 7,400 and 10,000 feet.
58. *Geothlypis macgillivrayi*. MACGILLIVRAY'S WARBLER.—Tolerably common. Very shy and difficult to procure. I have never found it above 9,000 feet.
59. *Sylvania pusilla*. WILSON'S WARBLER.—Abundant up to 10,000 feet.
60. *Cinclus mexicanus*. AMERICAN DIPPER.—Rare. A pair of the birds were taken by myself at 8,000 feet.
61. *Salpinctes obsoletus*. ROCK WREN.—Not very plentiful. Never observed above 9,000 feet.
62. *Catherpes mexicanus conspersus*. CAÑON WREN.—Occurs sparingly at 8,000 feet.
63. *Troglodytes aëdon aztecus*. WESTERN HOUSE WREN.—Common at 10,000 feet.

64. *Certhia familiaris montana*. ROCKY MOUNTAIN CREEPER.—Common at 10,000 feet.
65. *Sitta carolinensis aculeata*. SLENDER-BILLED NUTHATCH.—Very common at 10,000 feet.
66. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Common at 10,000 feet.
67. *Sitta pygmæa*. PYGMY NUTHATCH.—Very abundant between 7,000 and 10,000 feet.
68. *Parus inornatus griseus*. GRAY TITMOUSE.—Found sparingly at 8,000 feet.
69. *Parus gambeli*. MOUNTAIN CHICKADEE.—This, the most abundant of our Tits, is found at 10,000 feet and upwards.
70. *Parus atricapillus septentrionalis*. LONG-TAILED CHICKADEE.—Does not appear to be found above 8,500 feet.
71. *Psaltriparus plumbeus*. LEAD-COLORED BUSH-TIT.—Occurs only up to 7,800 feet.
72. *Myadestes townsendii*. TOWNSEND'S SOLITAIRE.—Common. Breeds at 9,500 feet.
73. *Turdus aonalaschkæ auduboni*. AUDUBON'S HERMIT THRUSH.—Tolerably common, breeding up to 10,000 feet.
74. *Merula migratoria propinqua*. WESTERN ROBIN.—Common at 8,000 feet.
75. *Sialia mexicana*. WESTERN BLUEBIRD.—Abundant. Breeds as high as 9,500 feet.
76. *Sialia arctica*. MOUNTAIN BLUEBIRD.—Common up to 10,000 feet.

THE YOUNG OF THE RED-SHOULDERED HAWK (*BUTEO LINEATUS*).

BY FRED. H. KENNARD.¹

ON MAY 26, 1889, I found two young birds of this species in a nest in a pine in West Roxbury, Mass. They were covered with down, and I judged them to be somewhere between two and three weeks old. I took one of them, the larger one, and on May 31, just five days later, I returned and took the other. The first one had his primaries, secondaries, tertiaries and

scapulars beginning to grow, and the quills of his wing-coverts, as well as those of his tail-feathers, were just beginning to appear.

The second bird, which I took to be a couple of days the younger, had, when I left him in his nest, barely a quill to be seen; when, however, I returned five days later, all the above mentioned feathers had become well started, and the wing-quills and scapulars were well along; while a few feathers had appeared in the interscapular region.

On June 12, 1893, I procured three young birds alive from another nest in Brookline, Mass. These birds by their subsequent growth proved to be about two days apart in age, and the youngest and smallest of them, which I took to be a male, and which I called 'Pete,' was but two or three days older than the larger specimen I procured in 1889. On this ground I calculated that these three birds must be between three and four weeks old, and probably hatched about the 15th of May; somewhat later than my 1889 birds were hatched.

The subjoined diagram, showing the chronology of the growth of the Hawk's feathers, is the result of the above data, my deductions and notes and measurements taken at the times stated. From June 12 I can guarantee them as accurate, while on the days previous to that they may be only approximate, owing to the uncertain data at hand. From June 12 I show what progress the oldest Hawk made, while previous to that, the lines and dates are made up from the observations on the other two younger Hawks, and from data referring to the two 1889 Hawks.

I called the 1893 Hawks 'Bute' (short for *Buteo*), 'Topsy' and 'Pete.' The first two were older than Pete, and I supposed them then, and from their growth later, to be females. Bute, when I got her, had all the feathers that I have spoken of with regard to the 1889 Hawks, well developed. Her back feathers were also well along and had spread upwards and downwards, and there were, too, quite a lot of feathers on her breast. During the week June 12-18, inclusive, all the rest of her feathers either got well under way, or appeared, as shown by the diagram.

Topsy proved at first, by accurate observation, to be exactly two days behind Bute in the growth of her feathers, though she

caught up with her and even went ahead of her later. Pete was about two days behind Topsy when I found him; and though at one time he started to catch up, he finally dropped farther and farther behind.

As they grew, their feathers spread from the interscapular region upwards over the hind neck, nape, and back of the head, and at the same time backwards over the rump, towards the upper tail-coverts, which were already well grown. Their breasts, too, became more and more feathered, and these feathers spread upwards over their throats and chins, and the sides of their heads, as well as downwards over their bellies and sides, to meet their under tail-coverts, which had become well grown in the meantime. Almost the last parts to be covered were their thighs, which only became so when the growth on their bellies reached and extended down them. The growth under their wings, which came last, started at their finger tips and worked backwards towards their shoulders, finally meeting the growth on their sides.

The figures in the subsequent pages were calculated from measurements taken at certain intervals upon each Hawk. I measured their length from bill to tail; their extent from tip to tip; the length of the fourth primary, and of the middle tail-feather. From these measurements I could easily compute the growth of each Hawk per day, as well as the average growth of the three, which is also shown.

TABLES SHOWING GROWTH IN THREE YOUNG RED-SHOULDERED
HAWKS.¹

<i>Name.</i>	<i>Date.</i>	<i>Length.</i>	<i>Extent.</i>	<i>4th Primary.</i>	<i>Tail-feathers.</i>
Bute,	June 12, 1893,	12.00	26.00	4.00	2.50
Topsy,	" " " "	12.00	26.00	4.00	2.25
Pete,	" " " "	12.00	22.00	3.00	1.75
Bute,	" 14, " "	12.75	27.00	4.75	3.00
Topsy,	" " " "	12.75	26.50	4.37	2.87
Pete,	" " " "	11.75	23.50	4.00	2.25
Bute,	" 16, " 1 P.M.	13.50	28.50	5.50	3.50
Topsy,	" " " "	13.75	28.50	4.75	3.25
Pete,	" " " "	12.75	25.50	4.25	2.75
Bute,	" 19, " 6 P.M.	14.50	30.50	6.00	4.25
Topsy,	" " " "	14.75	31.00	6.00	4.13
Pete,	" " " "	13.75	29.00	5.00	3.50

Name.	Date.	Length.	Extent.	4th Primary.	Tail-feathers.	
Bute,	June 25, 1893	3 P.M.	16.00	34.50	7.50	5.25
Topsy,	" " "	" "	16.50	35.50	7.50	5.25
Pete,	" " "	" "	15.25	32.50	6.75	5.00
Bute,	July 1, "	5 P.M.	17.00	36.00	8.00	6.25
Topsy,	" " "	" "	17.50	36.25	8.25	6.57
Pete,	" " "	" "	16.25	34.75	8.00	6.25
Bute,	July 9, "	7 P.M.	18.00	38.00	9.25	7.50
Topsy,	" " "	" "	18.00	38.50	9.25	7.50
Pete,	" " "	" "	17.00	35.50	9.00	7.00
Bute,	July 16, "	5.30 P.M.	18.25	41.00	10.00	8.00
Topsy,	" " "	" "	18.50	41.00	10.00	8.00
Pete,	" " "	" "	Dead			

¹ Measurements in inches.—These measurements, made at intervals as above, are as nearly accurate as the temper and strength of the Hawks would allow.

GROWTH PER DAY IN INCHES.

	Number of days.	Length.	Extent.	4th Primary.	Tail-feathers.
Bute,	{ June 13-14.	.38	.50	.38	.25
	{ " 15-16.	.38	.75	.38	.25
	{ " 17-19.	.33	.67	.16	.25
	{ " 20-25.	.25	.67	.25	.16
	{ " 26-July 1.	.17	.25	.08	.16
	{ July 2-9.	.13	.25	.16	.16
	{ " 10-16.	.23	.43	.11	.07
Topsy,	{ June 13-14.	.38	.25	.19	.31
	{ " 15-16.	.50	1.00	.19	.19
	{ " 17-19.	.33	.83	.42	.28
	{ " 20-25.	.28	.75	.25	.19
	{ " 26-July 1.	.17	.12	.13	.25
	{ July 2-9.	.06	.13	.13	.29
	{ " 10-16.	.07	.08	.11	.07
Pete,	{ June 13-14.	.38	.50	.50	.25
	{ " 15-16.	.50	1.00	.12	.25
	{ " 17-19.	.33	1.06	.12	.12
	{ " 20-25.	.25	.58	.29	.25
	{ " 26-July 1.	.16	.58	.21	.21
	{ July 2-9. ¹	.09	.09	.12	.09
	{ " 10-16. ²				

¹ Sick.² Dead.

AVERAGE GROWTH PER DAY.¹

<i>Days.</i>	<i>Length.</i>	<i>Extent.</i>	<i>4th Primary.</i>	<i>Tail.</i>
June 13-14.	.38	.50—	.38—	.25+
“ 15-16.	.50—	1.00—	.62	.25+
“ 17-19.	.33	1.00—	.25+	.25—
“ 20-25.	.25+	.67	.25—	.20+
“ 26-July 1.	.16+	.25+	.16	.20—
July 2-9.	.12+	.25+	.12+	.12
“ 10-16.	.16+	.25+	.12+	.06+

Of course these figures ought not be taken as absolutely accurate, on account of the difficulty of obtaining anything approaching accuracy. It is hard even for two people to measure a biting, screaming, struggling, clawing Hawk, even under the most propitious of circumstances.

When I first disturbed my 1889 Hawks, they were very vociferous and screamed loudly, just as their parents often do; but when I first got my 1893 Hawks they were very quiet and retiring, only peeping occasionally, and keeping their heads down, and if possible under each other, or in the corner of their box. They did this for several days, until they had gotten used to me, and for some time later, if they were scared in any way, they would turn about with their heads low down and pointed away from me at the corner of their box.

The first day I procured them I put them in a soap box, perhaps half full of hay, and placed it on a shelf in front of an open window in a room in my barn. I was careful for some time about their temperature, and opened or shut the window or covered their box with a blanket, as the weather seemed to warrant. For the first twenty-four hours they absolutely refused to eat of their own accord, and I was forced to stuff their crops full of raw beef, cut up for the purpose, three times a day. However, on the 13th of June, the second day I had them, both Bute and Topsy seemed glad, occasionally, to pick pieces of meat out of my hand, though I still had to stuff Pete's crop.

¹ This table shows approximately the average growth per day of the three Hawks during the time given in the first column, the measurements being taken on the last day on each line.

Pete was not averaged into the last two lines, as he was at first sickly, and slow of growth, and then died.

The sign — means less than; and the sign + means more than.

Both Bute and Topsy were very quiet at first, Topsy particularly so, but Pete was both active and noisy, and gave me a fair idea of what he was going to turn out to be.

June 15 I was surprised in the afternoon to find Bute seated upon the edge of his box philosophically considering the landscape outside his window. How he managed to get there I do not know, for though the oldest and strongest of the three, he was still too weak to stand more than a minute at a time. I then concluded to take them out of the box, both because Bute could climb out of the box himself, and also because the box was fast becoming very dirty, on account of their copious evacuations which were kept about them by the high sides of their box. So instead of a box, I made them a nest of hay, on the shelf, which would allow of their getting up and walking around, and which was more cleanly and airy.

Their method of evacuating was most interesting, showing as it did, their manner of keeping their nest comparatively clean without aid from their parents.

They would invariably turn their heads towards the centre of their nest, and, elevating their tail ends, would project their droppings with a forcible and audible sound, several feet away from the nest. I measured the distance to several that had fallen on their shelf over four feet from their owner, and some on the floor, which was eighteen inches below the shelf, were over six feet from the edge of the nest.

As the birds grew older, and were able to sit upon their perches, their evacuations became less forcible, less frequent, and less copious.

On June 16 I concluded to feed them but twice a day, instead of three times, as they were often obstinate about taking their food and required stuffing, and I judged that a little wholesome hunger might do them good.

They had, in the last four days, not only grown feathers so fast that you could almost see them grow, but they had also become much stronger on their feet, and livelier generally. Bute, as may be seen by the diagram, was almost covered with feathers, and Topsy and Pete were following along just two days behind relatively as to their growth and plumage. It was at this time that Bute grew the fastest, while Topsy and Pete reached their

maximum rates of growth a little later, and from this period of maximum growth they all gradually fell back a little at a time, until I went away from them on the 16th of July.

On June 20 I made up my mind that Bute was getting to be quite a bird. She had on several occasions objected to being fed, thinking perhaps she was too old for such childishness, and on this day she utterly refused to eat at all, when I held out food for her to take; and bit and screamed and clawed frightfully when I attempted to force her to swallow. I finally had to give in and concluded to let her go hungry.

I built some perches, this day, and on placing Bute on one of them was surprised to see her flop off, down to her nest about fifteen inches away; she was evidently beginning to learn the use of her wings, and would also spread them when she ran up and down her shelf; she was also learning how to look angry, for upon my bothering her in any way, she would raise her head and back feathers and extend her wings in a drooping position, looking very fierce, even at that early age.

On June 21 I found that Bute had concluded to eat for herself, for several pieces of meat that I had left on her plate the day before had disappeared, and were only accounted for by a noticeable swelling in her crop. I caught her later in the same day, with a piece of meat under her foot tearing and eating it in a very ferocious and independent manner.

Topsy and Pete still ate as usual, and seemed little inclined to follow in Bute's footsteps. From this time Bute seldom would take anything from my hand and absolutely refused to be stuffed, and so either fed herself or went hungry.

On June 25 I noticed that Topsy was rather getting ahead of Bute in size, and I could not help inferring that this relative change might be directly referable to Bute's independence on the food question, and the result of consequent lack of nourishment on her part.

June 27 I took Topsy for an airing. I chose her because she was most tractable. Bute felt her oats too much and was too wild and lively, while poor little Pete, with his ugly, noisy disposition was still too weak on his legs to allow of much running about. At first I carried Topsy on my fore-arm, but finding that my sleeves were not impervious to her very sharp talons I con-

cluded to carry her on a short stick instead. I took her out on the lawn, and upon putting her down, she sat still for a few minutes, and then spreading her wings gave a series of long flopping hops; then she sat still for a time, apparently wrapt in thought. Her first appearance having been noted by several birds in the vicinity, she had by this time plenty of food for thought, and plenty to look at too. A very saucy Blue Jay had started the racket, and he had been backed up immediately by lots of Robins, English Sparrows and 'Chippies,' and by the time she had gotten through hopping, Orioles, Grosbeaks, and even one little Least Flycatcher had joined in the mob, and if Topsy moved in any way except to turn her head, she was immediately assailed by a dozen different birds from as many directions. She, however, except to watch them occasionally, appeared to pay but little attention to them. From this time on I took her out as regularly as possible, not only to exercise her but to watch her and the antics of the mob that invariably followed. She became a great pet, never behaving badly in any way, and was always ready to eat from my hand if I offered her anything, though she was perfectly well able to help herself to food whenever she cared to.

Bute continued to be independent and untamable, and both she and Topsy could fly around their room, from perch to perch, in very good style by the end of June.

Pete, however, remained incorrigible; he seldom if ever ate by himself, and would hardly ever eat from my hand, and invariably resented being stuffed. I remember particularly one tussel I had with him on the first of July. He was very ugly, and I tried what slapping his head would do, as discipline. He screamed fearfully, so much so that some of the neighbors came in to see what the matter was. He bit my finger and tried his best to claw me, striking at me with his feet. He erected his head, neck and interscapular feathers, and even ruffled his breast feathers and drooped his wings. This last was the sign of extreme rage, and his position for active defence.

I took Topsy out as usual, on July 1, and though she had all the usual mob of birds around her, there were also a couple of Vireos, a Golden-winged Woodpecker, and a couple of Blue Jays, that seemed particularly active in the assault. The Woodpecker approached very close to her, and the Blue Jays actually flew

against her head, trying seemingly to pick her eyes out. I noticed, too, that upon the appearance of the Blue Jays, the smaller birds seemed to pay much more attention to them than to Topsy. I gathered in one of the Jays, and wounded an English Sparrow which I took up to the Hawks' room and introduced to Bute. Bute had never in her life seen a live bird. Nevertheless, as soon as the Sparrow attempted to flutter across the room, it had not gotten two feet before Bute had swooped down upon it from a high perch, in the most approved Hawk fashion. She grabbed it with both feet, and upon my retiring to a distance, proceeded to tear the feathers from off its neck and eat that portion of its anatomy. While doing so, she showed up her importance to the best of her ability by erecting or extending each and every feather she had, even her tail being spread to its fullest breadth, and her wings drooping down on each side of her till they touched the shelf on which she stood.

Topsy had for some time been catching up with Bute in cleverness, as well as growth, and on July 2, when I gave her a piece of the meat that was too big for her to eat whole, she took it in her talons and tore it with her beak. Pete, too, had been caught lately feeding himself out of the plate in which I usually kept their food, so I now felt relieved of the responsibility of feeding any of them, except for pleasure.

On July 7, although Pete had been feeling pretty well all the week, and although he was still growing, though perhaps not so fast as his sisters, I decided to gather him to his fathers. He had been growing weaker and weaker, and was hardly able to stand, much less to walk. When he tried to stand it was pitiable to see him; a sort of creeping paralysis seemed to have seized him. So I put a pistol ball mercifully through him and ended his ugly, noisy, contrary existence.

On this same day I was compelled to clip one of Topsy's wings; she had caught the trick of late of flopping from branch to branch, up any tree that came handy, and it had become only a question of time until she should get up so far that I could not get her down, or until she should fly away entirely.

On July 16 I went away for the summer, and, I am sorry to say, bade good-bye to my Hawks forever. They had the best care that my family could give them, but in spite of this they both died

before I returned in the autumn, and apparently of the same disease which sickened Pete. Bute died about three weeks after my departure, and Topsy about three weeks later. I was sorry to lose Bute for I valued her, but I was really sad at Topsy's demise—she had been an admirable pet from beginning to end, always quiet and docile, with all the virtues and none of the vices of her brother and sister, and she had become quite a companion.

Of course their food (they lived entirely on raw beef except a very occasional sparrow) probably did not agree with them, but I lay the cause of their death more to their want of freedom, and consequent lack of exercise. Pete was too young perhaps when I took him, and on account of his contrariness did not get the advantages the others did. He got no exercise whatever, and sickened long before the others showed any unhealthy signs. Bute was intractable, and though she could fly around a room and get some exercise that way, she seldom did. Topsy, on the other hand, got more or less of open-air freedom, and I feel sure would have lived had I been home to take her out.

In ending I would suggest that if any one wants more accurate data obtained under more natural conditions than the above, they should find some Hawk's nest of easy access, and climb up to it each day for regular data. I leave this task to some one else, however, as I have neither the time nor the patience.



BREEDING HABITS OF THE KING PENGUIN (*APTENODYTES LONGIROSTRIS*).

BY R. G. HAZARD.

Plate VIII.

IN 'BULLETIN No. 2' of the United States National Museum (p. 41), Dr. J. H. Kidder mentions a curious habit of the King Penguin (*Aptenodytes longirostris*) upon the authority of Captain Joseph J. Fuller. He says: "Captain Fuller, of the schooner Roswell King, informs me . . . that they [the King



Penguins] build no nests whatever, carrying the egg about in a pouch between the legs, and only laying it down for the purpose of changing it from male to female."

This 'Bulletin No. 2' was printed in 1875. In 1891 I had the good fortune to meet this same Captain Joseph J. Fuller, then about to sail for the Antarctic as Master of the sealing schooner 'Francis Allyn.' After some experimenting with cameras to find one best suited to the bad conditions of the Antarctic, we found a camera combining the essential virtues and agreed that one principal point to settle should be this one as to the egg-carrying habits of the Penguins. If possible a King Penguin was to be photographed so as to show the egg in position in the sac. Captain Fuller told me he felt sure he could manage the camera, which was fitted with a roll holder and films, but greatly feared the dark and foggy weather prevailing would hinder the best results.

About ten months later I received four rolls of films by schooner from St. Helena, where the 'Francis Allyn' had transhipped her catch of skins. They were Eastman films and many were excellent, especially such as had been exposed in sunlight at Cape Town, St. Helena, and Tristan d'Acunha. But the special efforts made to photograph seals, sea elephants, Penguins of all degrees, Skuas (*Buphagus skua antarcticus*), Johnny Rooks (*Senex australis*), Sheath-bills (*Chionis minor*), and many another strange and interesting denizen of that comfortless Antarctic region were all failures, in part at least. The weather was no doubt largely responsible for this, and in many cases there was barely light enough to show a horizon line. The large percentage of failures was relieved by the fact that some of the best and most decipherable among them bore precisely upon the point stated by Dr. Kidder upon the authority of Captain Fuller. The photograph from which Mr. E. Whitney Blake has kindly made a careful scale drawing now reproduced, was one of the best of three, all meant to show the egg *in* the pouch. All three were taken on Kerguelen's Island, during January, 1894, at which time the whole 'rookery' of Penguins was incubating. While the sailors caught the birds, then not a hard task, Captain Fuller photographed them, and while very bad photographically, it is possible to decipher at least one of them, as I think the drawing

proves. A careful inspection of the original shows the larger end of the egg, which barely projects from the external sac, which holds it firmly between the thighs of the bird, a King Penguin. The bird reclines in its position in the sailor's arms, while his finger holds the egg securely, to prevent the bird dropping it. The soles of the Penguin's feet, if one may so speak, are turned up toward the camera, and are clearly defined against the breast. Mr. Blake's drawing shows all this and more.

The Penguins, as shown in the photograph, stand dismally in pessimistic attitudes, scornful and disgusted at the intrusion, highly disapproving and indignant over the outrage with the camera. They seem to be wondering over the strange times on which they have fallen.

Upon Captain Fuller's return, nearly eighteen months after his departure, he brought me a most interesting mass of material; including a fine series of the eggs of *Chionis minor*, with skins of this singular bird, which is neither Pigeon nor Gull, yet partakes of the nature of each. He also secured eggs of the Southern Skua (*Buphagus skua antarcticus*), Wandering Albatross (*Diomedea exulans*), and others, all of which I retain in my cabinet.

If the accompanying drawing should be held to have settled this question, I shall hope to be allowed to convey the information to Captain Fuller, who is at present pursuing his isolated, arduous life among the seals, and to whom the credit should belong. I myself am entirely convinced from the development of my plate, that the case is proved beyond any question.



PLUMAGES OF THE YOUNG HOODED WARBLER.

BY WILLIAM PALMER.

SEVERAL young male Hooded Warblers (*Sylvania mitrata*) collected by myself in Hanover County, Virginia, in July, 1892, differed so much from published descriptions that I called attention to them in a paper read at the Washington meeting of the A. O. U. of that year. Hoping to secure a better series,

publication was delayed, so that I have now before me a series of twenty-six specimens, illustrating the young of the year after leaving the nest, and all collected in Hanover and King William Counties, Virginia, besides a large series of adults from the same and other localities.

I quote below various statements that I have found in the literature of the species, having italicized the parts which differ from the facts as illustrated in my specimens.

Professor Baird, in the Pacific R. R. Report (Vol. IX, p. 292), says: "An immature *male* differs from that described above by having the black of the head restricted to a margin of the yellow on the top and sides, and a faint indication of the same on the throat."

In the Hist. N. Am. Birds (p. 314) he also says: "A young *male* in second year (2245, Carlisle, Penn., May) is similar to the female, but the hood is sharply defined anteriorly, though only bordered with black, the olive-green reaching forward almost to the yellow; there are very slight indications of black on the throat. Apparently the male of this species does not attain the full plumage until the third year."

Dr. J. M. Wheaton (Report on the Birds of Ohio, 1882, p. 279) describes a young *male* taken at Columbus, Ohio, August 25, 1874, as follows: "Above, yellow-olive, concealed yellow from bill to eyes; feathers of crown and occiput with dark plumbeous bases and centers, some of the feathers of sides of crown with scarcely concealed black tips, line from bill over and around eye bright lemon yellow, separated from the uniform yellow of throat, breast, and abdomen, by dusky lores and olive-yellow auriculars; under tail coverts very light yellow. Tail spots as in the adult. Bill very pale, dusky shaded."

This description agrees in some respects with Professor Baird's specimen mentioned above, obtained by him at Carlisle, Pa., May 7, 1845, and labeled as a male by the collector. I have no hesitation whatever in calling Dr. Wheaton's bird a young female of the year, and Professor Baird's specimen a female at least two years old: the error of sexing having been caused by the fact that the supra-renal capsules were mistaken for testes. Unfortunately this error is only too easily possible when birds are left for some time before skinning or when injured internally.

Dr. Merriam, in his 'Review of the Birds of Connecticut' (Trans. Conn. Academy, Vol. IV, 1877, p. 26), speaks of this species as follows: "From the limited amount of material I have been able to examine, and from the notes given me by Mr. Sage and Mr. Bicknell, I am inclined to believe that the female bird, *like the male, is several years — at least three — in attaining its full plumage; . . .*"

Dr. E. A. Mearns (Bull. Nutt. Orn. Club, Vol. III, p. 72) quotes the above from Dr. Merriam and adds: "With a large series of specimens before me, I can fully indorse Mr. Merriam's views. The females of the second summer *are entirely without any black upon the head*, and I have frequently found them sitting upon their eggs in this condition. Males of the same age show very evident *traces* of black."

Mr. Ridgway says (Manual, 1887, p. 527): "Young in first autumn: *similar to adult female, without black on head.*"

He also, in the 'Birds of Illinois' (p. 175) quotes Dr. Merriam and Dr. Mearns as above, and on page 173 says: "Young: *no black whatever about the head.*"

Dr. Coues (Key, 1892, p. 313) describes the young as follows: "♀, adult, and young ♂, with the *black restricted or interrupted, if not wholly wanting, as it is in the earlier stages, when the parts concerned are simply colored to correspond with the upper and under surfaces of the bird.* Hood said to be not perfected until the *third* year, and to be finally acquired, in the fulness of its extent if not in the purity of the black, by the female."

The only approximately correct statement that I have been able to find is that of Messrs. Samuel F. Rathbun and Frank S. Wright (Bull. Nutt. Orn. Club, Vol. IV, p. 117) as follows: "We secured female birds with the black gradating from a single spot to a full tracing of the hood. We also found young males of the year with the black as *dense and glossy* and the yellow as rich, as in the best adults; yet the little 'spike-tails' scarcely exceeded half an inch in length, and their peculiar plumage marked them as young."

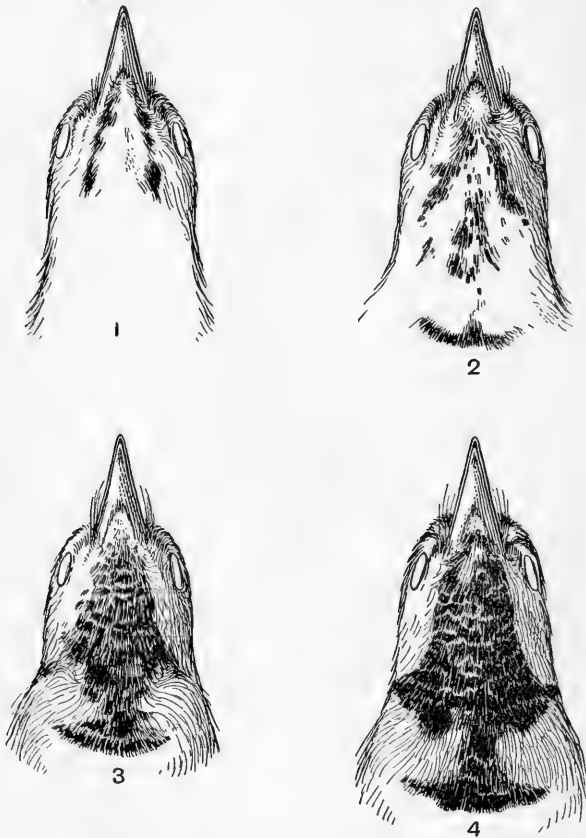
It seems most improbable that such a difference should exist between the specimens mentioned above and those described below, which were all collected by me in Virginia.

Young birds of both sexes are identical in coloration when they leave the nest, the body feathers being a pale slate color with more or less brownish drab tips, appearing darker where the feathers are thickest; such as across the chest, on the sides of the head over the eyes, in the center of the back and on the wings. The tips of the back feathers are decidedly reddish. Feathers of the underparts below the breast nearly white, tipped with yellowish. Ear-coverts slightly yellowish; edges of wing-coverts distinct and pale reddish. Rictal bristles very short. Tail-feathers in the female 1.13 inches, in the male 1.38 inches. Inner webs of three outer tail-feathers blotched with white. Upon lifting the breast feathers the yellow pin feathers of the new plumage are easily seen. No. 133223, male juv., and No. 133224, U. S. N. M. Coll., female juv., Studley, Hanover County, Virginia, June 25, 1894. Both of the above were from the same nest, the parents also being secured, the black on the female being confined to a spot on each side of the crown; evidently a bird of the previous year.

The first true body feathers to appear in both sexes are a line of yellow on each side of the breast, as seen in so many young birds, and at the same time a few appear as pin feathers within the area enclosed by the two branches of the lower mandible. A series of fifteen males and eleven females show well the various stages from the nestling to the fully fledged young.

No. 133225, male juv., June 25, 1894, Studley, Hanover County, Virginia, U. S. N. M. Coll., has considerable green on the back below the neck; the yellow of the abdomen is decided and exists as two stripes, separated by a broader division of the nestling plumage. A slight line of yellow appears extending backwards from the posterior corner of the eye. The area between the eye and bill is also yellow, the wiry tips of the feathers being black; rictal feathers longer but not yet fully grown. The yellow of the lores meets under the eyes a faint line of yellow extending from the edge of the feathering on the lower mandible to past the eye and almost encircling the ear-coverts. The first black appears in the form of two lines under the throat as shown in Fig. 1. Pin feathers are numerous on a line in the center of the crown, the posterior end of which shows the tips of new black feathers. Wing-coverts unchanged. Tail 1.88 inches long.

No. 133226, same sex and date as above, represents a step further, the under parts being yellow except for the center and abdomen. The increased area of the black of the throat is shown in Fig. 2, the black crescent on the breast being joined posteriorly to a crescent of yellow, both being separated from the yellow side stripes by the remaining nestling feathers. More



FIGS. 1-4. YOUNG HOODED WARBLER.

green feathers have appeared on the back and shoulders, the first plumage having mostly disappeared on those parts. The black hood has further developed and presents the general appearance of the cap as seen in an adult male Wilson's Black-

cap, though still showing some pin feathers, the anterior edge being more or less irregular in outline. When first collected the black feathers on the posterior portion of the crown patch of this specimen showed beautifully the continuous development of the feathers; several of the new black feathers being tipped with the pale nestling feathers, which also bore on their tips the long smoky-black down. These black feathers of the crown and throat are very dull in color, and are minutely tipped with yellow on the throat and with green on the crown. The tips of a few black feathers show behind the ears, between the hood and throat patches, but do not meet either. The stiff yellow feathers between the eye and bill are decidedly tipped with black, appearing much darker than in the same area in adult birds, this being due to the crowding of the new feathers. Yellow feathers have developed on the forehead but are obscured by the nestling plumage; the most advanced show black tips. Yellow feathers have also appeared nearly encircling the eye, while the posterior end of the supra-auricular region is also yellowish and meets the yellow feathers around the ear-coverts, thus giving the sides of the face an almost yellow appearance. The lower back is completely covered with the green feathers of the new plumage on which the tips of the nestling feathers remaining on the neck show quite reddish. Tail 2.19 inches long. The nestling wing-coverts have dropped out and new ones have not yet appeared.

No. 133227, male juv., same date as above, is still further advanced: the entire back except the neck is covered with the new plumage; the yellow of the underparts occupies a larger area and is almost connected across the chest with the breast patch, the yellow of the underparts thus appearing somewhat as an inverted U. The hood is better developed, the feathers being nearly half grown, smoky-black in color, each bordered with a narrow edge of green, the colored margin being distinctly discernible. The throat patch, as shown in Fig. 3, has increased in size and is connected with the hood by a partially developed line of black surrounding the auriculars. Yellow feathers have encircled the eye, the entire face has strengthened in color and now presents the same pattern as in the adult male, except that the center and anterior portion of the auriculars are still in the

nestling phase. The sides of the neck and the region between the hood and auriculars are still covered by the short persistent feathers of the nestling plumage. Tail 2.31 inches long, thus equaling the adult. Yellow under tail-coverts just beginning to appear.

No. 133228, male juv., June 29, 1894, Aylett's, King William County, Virginia, is still older, the throat patch is larger, as shown in Fig. 4, and a better defined black line connects it with the hood. Pale lemon-yellow under tail-coverts have now appeared, but the nestling phase still shows almost entirely around the neck, on the abdomen, down the center of the breast, on the central part of the ear-coverts, and along the sides of the hood.

My series of young females does not exactly correspond in age to the various stages of young males as above.

No. 133229, female juv., is a sister of No. 133227, but of course differs in the absence of black: the throat and breast are entirely of a pale lemon-yellow interrupted on the sides of the head, behind the eyes, by the remains of the nestling plumage. Top of head a duller green than the back, with the rump brighter than either; the sides of the breast are still divided in the center by the persistent remains of the nestling plumage, which also shows entirely around the neck, except on the throat. There is a break in the new feathers on each side of the breast, so that the yellow of the underparts appears in three nearly confluent patches — one on the throat and chin, and one on each side of the under body; yellowish under tail-coverts well developed.

It now remains to describe the full plumage of the young of both sexes, which so far as I am aware has never been done. A comparison with many specimens of adult birds show that the pattern of coloration of the young male in the first autumn is almost identical with that of the adult male, while in the young female it is identical with those specimens of adult females showing the least amount of black on the head; a mere spot, present in all specimens that I have examined.

Young male, fully fledged, No. 127313, U. S. N. M. Coll., Studley, Hanover County, Virginia, July 6, 1892. Entire plumage of same pattern as adult males; but black less intense, the ends of the feathers being

minutely tipped on the throat and chest with yellow, on the sides and crown with green; yellow of head minutely tipped with blackish, especially on the lores, where the black nearly obscures the yellow. Entire underparts pale lemon-yellow, greenish on sides; wings and tail as in adults, but lower wing-coverts slightly tipped with yellowish. Back and sides show less intense olive-green than the middle and lower back; three outer tail-feathers blotched on inner webs with white, that of the third being smaller and restricted to the end. Feet and tarsi paler than in adults, as is also the bill, especially the lower mandible, which has only a little black beneath near the tip.

Young female, fully fledged, No. 133230, U. S. N. M. Coll., Studley, Hanover County, Virginia, July, 1894. Entire plumage similar in pattern to those spring and summer females showing a least amount of black on head. Yellow of sides of face obscured by the greenish tips of the feathers, being especially darker on the ear-coverts. Green of head continuous in the center to the bill, completely obscuring the yellow bases of the forehead feathers. Lores lemon-yellow but densely tipped with black, appearing much darker than in adults. Yellow around eyes well defined and continuing backwards as a broad stripe over center of auriculars. Underparts uniform palish lemon-yellow; sides greenish; throat paler with a greenish darkening just below showing very faintly the outlines of a breast patch. A little above and behind the eyes are several nearly concealed black feathers with green tips. Bill and feet as in the young male; tail similar but with the inner blotch nearly surrounded with dark color.

A description of a bird is necessarily confined to its plumage conditions at the time of its being collected; hence I have attempted above to give some idea of the rapid change that this species undergoes from the nestling to an apparently full fledged bird.¹ Additional specimens kindly collected for me during July and August, by my young friend, Master P. Henry Aylett, of King William County, together with others collected by myself in Hanover and King William Counties, Virginia, during the latter part of August of this year, indicate that a further, but much slower change has taken place. Upon lifting the feathers of the last two specimens described above, a few pin feathers will be found which might casually be considered as the last feathers to complete the change from the nestling. A comparison of these and others of similar date with older young birds

¹ It was impossible to get the exact time. None in the nestling plumage were seen after June 25, or like Figs. 1 and 2 after June 30. None like Figs. 3 and 4 were seen after July 4, and no fully changed birds were seen before the same date.

collected during the latter part of July and in August in the same localities, shows how the change has been effected; the yellow and green parts have become much richer in color, while the black feathers are more abundant, with stronger and more regularly marked yellow and green tips. It is almost impossible to notice the change of color on comparing individual feathers, but taken collectively there is a decided change from the paler almost whitish yellow of the younger birds to an intensity of color nearly approaching orange in the last collected specimens. That the change is slow is shown by the presence of pin feathers even in the last specimens collected on the 26th of August, so that the later dated specimens all show a greater abundance of richer, deeper colored feathers all over the body as contrasted with the June and early July young birds. The moulting of the first flight feathers and the growth of new ones as indicated by the "spike-tails," mentioned by Messrs. Rathbun and Wright, as quoted above, has not taken place in any of my specimens.¹ If they really moult then the change must take place after the moult on the body is fully completed. No appreciable difference is found on comparing a number of these late young males, but in the females of corresponding ages there would seem to be some slight difference in the size and exact location of the black spots on the head. On the last female described above, the spots are decided, while on others they are much less so, hardly two being alike. On one they consist of a mere dusky darkening near the tips of a few feathers, while on two specimens I have been unable to find any, though, as the region of the spots is the last to complete the new plumage and pin feathers are still visible, it is possible that they have not yet appeared.

It would thus seem, in the light of my experience and specimens, that the changes in this species from the nestling to the adult plumage takes place in these counties of Tidewater Virginia, approximately between the 20th of June and the 6th of July, and that a further and more gradual change, requiring about six weeks, brings them to the same general plumage as

¹ I am now strongly inclined to the opinion that their birds were not young at all, but adults acquiring the fall plumage.

the adult, except for the colored tips to the black feathers. I am inclined to think, however, that eight, or at the most ten, days are sufficient for the change, instead of three years, as implied or stated in the quotations given above.

Immaturity in this species is therefore recognizable, especially by the presence of differently colored tips to the head feathers, which are more or less persistent until the birds moult again in July of the following year; there being, I have good reason to believe, but one moult a year in this species.



NOTES AND SONG-FLIGHT OF THE WOODCOCK (*PHILOHELA MINOR*).

BY WILLIAM BREWSTER.

IN 1891, Mr. Walter Faxon and I spent two evenings and one morning studying the notes and song-flight of the Woodcock, and the present article consists merely of a transcript of the memoranda made on these occasions,—viz., the evenings of April 7 and 13, and the morning of April 8, the locality being Lexington, Massachusetts.

Lexington, Mass., April 7, 1891.—Mr. Faxon found a Woodcock singing on the evenings of the 5th and 6th and the morning of the 7th on the top of a high hill near the village. I went there with him this evening, arriving at 6.25, when the bird was already peeping. There were seven song-flights and eight peeping spells in the next thirty-five minutes, the last peeping being unusually protracted and the bird, at its close, rising and flying off low down without singing, at precisely seven o'clock. At this time it was still rather light or, at least, not nearly so dark as the night afterwards became. The weather was cold with a strong northwest wind, the sky overcast. The *paaps* were uttered consecutively 31, 21, 37, 29, and 28 times, no counts being made during the first and last calling periods. The song proper (timed once only) lasted exactly ten seconds.

The song-flight (timed once) from start to finish, the bird being actually seen to leave the ground and to alight on his return, lasted just one minute. We watched the bird through several flights. He always sprang directly into the wind and flew nearly straight for about 100 yards, rising at a very slight angle with the ground. He then turned, sometimes to the right, sometimes to the left, and flew about 200 yards with the wind, curving slightly and mounting rapidly on this stretch especially near its end. The next stretch, a half spiral, carried him to the highest elevation, about 300 feet. He then described a rather large circle on a level plane and after this flew about irregularly in smaller, incomplete circles and broad spiral curves all of which inclined downward. Once he described a double curve nearly like the letter S. Although he was a strong and musical singer he did not pitch down on zigzag lines while singing like all the other birds that I have seen, but merely followed the gently sloping lines just described, his descent, during the song, being scarcely more steep than during the twittering which immediately preceded the song. He looked very bat-like, darting irresolutely about in the dusky sky. The song proper was interspersed with more or less twittering. At its close the bird shot down in the usual manner on set wings, flapping his wings a number of times to check his speed just before he reached the ground. Sometimes he would alight immediately after this flapping, sometimes skim close over the earth for several rods before finally settling.

By making a quick run while the bird was in the air I succeeded in reaching and crouching behind a small cedar on the edge of the opening where he usually alighted. He settled on the further edge of this within about fifty feet of me, and for a moment or two stood perfectly still. Then he uttered about twenty *paaps* without changing his position or taking a single step. Each *paap* was closely preceded by a *p't-ul*, so closely at times that the two sounds were nearly merged, suggesting that one of them might be mechanical! Sometimes two *p't-uls* preceded the *paap*.

The delivery of each *paap* was accompanied by an abrupt backward, followed by a forward and downward, jerk of the head and a slight opening of the wings. The bird did not turn about

as Mr. FAXON had seen him do on a former occasion, but after peeping about twenty times he made a crouching run of a few feet in a half circle. When he stopped he was lost to my sight behind a small bush. While under my observation I could not see him very distinctly, owing to the fact that the light was dim and on his further side, he being to the west of my position. After peeping a few times more he rose, flying off up wind, mounting at first very gently, in fact skimming close to the ground for the first twenty yards, but probably rising slightly during even this distance. During the remainder of the ascent he rose more and more steeply the further he proceeded. Mr. FAXON tells me that on the two preceding evenings, as on this, he closed by a long spell of peeping, and then flew off to cover or feeding ground.

Lexington, Mass., April 8, 1891.—Reached the hill-top at 4.25 this morning; sky overcast, wind northwest, moderate; cold, the ditches and shallow pools covered with ice as thick as window glass. The eastern sky was reddening but there seemed to be less daylight than when our bird ceased singing last night. Nevertheless he was already at his post, for we heard him rise and sing before we had climbed halfway up the hillside. During the next twenty-five minutes he sang nine times and at the close of the ninth song scaled directly over his peeping place down the hillside into a piece of birch cover where he doubtless spends the day. Mr. FAXON tells me that he ended in the same way yesterday morning, that is, by flying to cover without peeping. It was practically broad daylight during his last ascent and I saw this performance, as well as the two that preceded it, nearly or quite as distinctly as if it had been noonday. The bird rose and descended precisely as he did last evening, but once during the descent he made two rather steep pitches (while singing). His ascent was fairly regular but his descent decidedly irregular. He sang last evening and this morning over nearly the same spot. His total flight extended over a space of fully five acres. During his last descent this morning I followed him with my glass and made out *distinctly* that while singing he alternately flapped his wings (several times in succession) and held them extended and motionless. During one of the periods when they were not moving the song was at its height and the

bird was gliding down on a *very* gentle slope. Perhaps *floating* would be a more correct term than gliding, for the motion was comparatively slow. Towards the end of the song the descent was steeper and the bird slid down the sky like a meteor. The flight of this individual is evidently very erratic and subject to excessive variations. I ran to the peeping spot during the third ascent but the bird alighted where I could not see him, owing partly to the darkness, partly to intervening obstructions of brush or grass. The next two times he was equally unaccommodating although he chose different spots, both within thirty yards of me, on each return. I then made another run and crouched in the middle of a ground juniper. Fatal mistake! I could not move without making a loud rustle or crunching of dry twigs. It was too late to change again, however, for the next instant the bird shot close over my head and alighted directly behind me *not ten feet off*. I could hear his wings rustle as he closed them. An interval of silence, a *p't-ul*, and then the harsh *paap* smote on my ear with fairly painful effect. At this close range it had a strange, vibrating quality. It seemed to penetrate my brain as if some one had blown a blast on a fish horn within a foot of my head. Another and another *paap*, each preceded by the usual *p't-ul*. I now attempted to move, but a slight sound which I made caused the bird to cease peeping at once. Silence for several seconds; then the *p't-ul* repeated six or eight times doubtfully; then the peeping resumed. I did not move again and the bird finishing its peeping rose and sang, descending fifty yards away behind some bushes. The next song-flight was the last.

The *p't-ul* is, I believe (and Mr. Faxon confirms this), usually repeated many times in succession, *without* the alternating *paaps*, when the bird is slightly alarmed or suspicious. My old comparison of the *p't-ul* to the sound and its echo made by a drop of water falling into a cistern struck me again this evening. This note also somewhat resembles the remonstrance made by a brooding hen, when disturbed. It can be heard about eighty-five yards away under the most favorable conditions but ordinarily not beyond thirty or forty yards. The hill where this bird sings is one of the highest (340 feet) near Lexington (220 feet). Its summit is broken by alternating knolls and hollows

and is open pasture land with a few scattered red cedars and ground junipers and occasional patches of hazel bushes. The peeping ground is in a hollow on the edge of a hazel thicket. The bird usually alights in an opening where close-cropped turf (now of a bleached straw color) alternates with patches of gray reindeer moss or dark green pasture moss.

The entire space embraced in the peeping ground would not exceed half an acre. Mr. Faxon saw the bird alight several times, on the night of the 5th, in the same place, but last evening and this morning he chose a different spot each time. The entire peeping ground, as well as the whole top of the hill, is perfectly hard and dry. Three sides of the hill are covered with second growth oak and birch woods, which appear to be also dry beneath. At the base of the hill on two sides, however, the land is wet and swampy.

We searched the 'peeping ground' carefully for Woodcock droppings but could find no trace of them. On April 11, Mr. Faxon searched it again without discovering a single 'chalking.'

Lexington, Mass., April, 13, 1891.—To the hill with Mr. Faxon at 6.30 P. M. Evening clear and warm (thermometer 60° at sunset, 62° at noon) with light west wind changing to southwest just after sunset. The Woodcock began peeping at 6.44. ('Last night he began at 6.30 and night before last at 6.40, both of these evenings being cloudy.'—*Faxon.*) He continued peeping nine minutes before making his first ascent, and made in all six ascents. ('Fifteen ascents were noted one evening last week.'—*Faxon.*) Two flights, which I timed from the start to the finish, lasted respectively 57 and 59 seconds, the song 11 and 12 seconds respectively. During the first ascent I ran to the peeping-place and sat down on the ground behind a large rock. The bird alighted on a little knoll covered with reindeer moss just nine paces from me. There was absolutely nothing between us, the rock being in front of me and the Woodcock on my right. For a moment he stood motionless and silent, then began peeping. I turned so as to face him, at the same time raising my glass. He evidently saw me, for he stopped peeping and uttered the *p't-ul* a number of times in succession, but soon after I had settled myself in the new position, he began peeping again and showed no further signs of alarm or suspicion. For

some time he stood facing the south, his right side turned squarely towards me, giving me a profile view. The light was still good and thrown directly upon him (he was to the east of my position). Through the glass I could distinctly see his color and markings, the large dark eye, the bill, feet—in short, every detail of form and plumage. In the intervals between the notes, his position, outline and the relative proportions of the different parts presented nothing peculiar. The body was held a little more erect than usual, the back rounded, the head raised, the bill inclined well downward, the tail depressed and closed, its tip just showing below the ends of the closed wings. There was no inflation of the throat, jugulum or breast, no ruffling of the plumage. In short, the bird looked in every way precisely like the conventional stuffed Woodcock that one sees in taxidermists' shops.

At each utterance of the *paap* the neck was slightly lengthened, the head was thrown upward and backward (much in the manner of a Least Flycatcher's while singing), the bill was opened wide and raised to a horizontal position, the wings were jerked out from the body. All these movements were abrupt and convulsive, indicating considerable muscular effort on the part of the bird. There was perhaps also a slight twitching of the tail, but this member was not perceptibly raised or expanded. The return of the several parts to their respective normal positions was quite as sudden as were the initial movements. The forward 'recovery' of the head was well marked. The opening and shutting of the bill strongly suggested that of a pair of tongs. During the emission of the *paap* the throat swelled and its plumage was ruffled but neither effect was more marked than with any of our small birds while in the act of singing.

The *p't-ul* note when closely followed by the *paap*, as was usually the case, was not accompanied by any of the movements just described but when, as occasionally happened, the bird repeated it several times without peeping, he moved his head and bill just as when peeping, but to a much less degree.

After a minute or two the Woodcock suddenly turned and, without changing his ground, took a position directly facing me. Viewed from in front the motions just described produced a somewhat different impression. The backward toss of the head

was no longer apparent, while the lengthening and shortening of the neck became more conspicuous. In fact the head now seemed to be bobbed up and down, much in the manner of an Owl's. The movement of the wings was more strongly marked, and its character and extent could be definitely traced. The wings were not spread or opened, but merely jerked out from the body spasmodically. The shoulders showed distinctly for an instant, but the primaries were at all times covered by the long overlapping feathers of the flanks and sides. These loose feathers moved out and in with the wings, giving the body the appearance of being laterally inflated and then contracted. The mouth opened to such an extent that I could look directly down the bird's throat, which appeared large enough to admit the end of one's forefinger. The lateral distention of the mouth was especially striking.

Wilson Flagg says (*Birds and Seasons in New England*, p. 333) that the Woodcock while peeping "may be seen strutting about like a Turkey-cock, with fantastic jerkings of the tail and a frequent turning of the head." Neither Mr. Faxon nor I have ever seen anything of the kind. On the contrary, one of the most marked features of the performance is the fact that the bird, when not in the act of uttering the sound, stands perfectly still, and always in about the same attitude. Our subject to-night did not once vary his attitude nor turn his head ever so slightly to one or the other side. It was not uncommon, however, for him to change his position after peeping a few times by turning partly around and facing in a different direction; and Mr. Faxon has repeatedly seen him move from place to place, over a space of a few square yards by quick, short runs, stopping to peep a number of times in succession on the top of each little mound that lay in his track and facing in different directions. Once to-night he faced all four quarters of the compass in succession, making a quarter turn each time without changing his ground. Each change of position produced a marked change in the sound of his voice. When his back was turned towards me, the *paap* sounded muffled and much more distant, while I could hardly hear the *p't-ul* at all. Mr. Faxon has seen him descend from the air to exactly the same spot three or four times in succession, but to-night he alighted in a different place after each flight,

possibly because he had seen me the first time. I had only one good view of him on the ground.

Mr. Faxon devoted his entire attention this evening to studying the aerial flight. His conclusions are that during the production of each set of musical (water-whistle) notes, the bird holds his wings extended and *set*, whether he be sailing or pitching down sharply at the time; and further that the wings invariably move rapidly and continuously in a whirring manner during the intermittent periods of twittering.

This morning Mr. Faxon found the bird already peeping at 4.15. He watched him through one peeping spell at a distance of fifteen feet (measured) from behind a small leafless bush.

BIRDS OF SOUTH-CENTRAL MONTANA.

BY CHAS. W. RICHMOND AND F. H. KNOWLTON.

THE observations recorded in this paper were confined almost entirely to Gallatin County, with short visits into the western part of Park County north of the Yellowstone National Park, and into the eastern portions of Madison and Jefferson Counties. The area embraced is about 75 miles in north and south direction, and 30 miles in east and west, or approximately 2500 square miles. It lies along the eastern flank of the Rocky Mountains, in the south-central portion of this great State. It is very much diversified, including the broad, fertile Gallatin Valley on the north with an altitude of only 4600 feet, the long, narrow Madison Valley on the west, the elevation of which is about 5000 feet, and the Gallatin and Madison ranges of mountains in the southern portion, with a general elevation of from 6000 to 9000 feet, with many peaks rising above 10,000 feet, and a few to over 11,000 feet. In the extreme northern portion of the area under discussion the three rivers—Gallatin, Madison and Jefferson—unite to form the headwaters of the Missouri. These streams all rise in the mountains far to the south and southwest, and hence flow approximately north. In their courses through the mountains they have in many places

cut for themselves deep cañons, producing scenery of the wildest and grandest kind.

Bozeman (altitude 4754 feet), a town pleasantly situated on the eastern side of the Gallatin Valley, and on the East Gallatin River, was made the headquarters. Some collecting was done in this vicinity, especially near Fort Ellis, and, farther south, in and about Rocky Cañon and Bridger Cañon. During the latter part of July an excursion was made to Mystic Lake, a small body of crystal water at an elevation of about 7800 feet, in the Gallatin Range 20 miles southeast of Bozeman. Thence it was continued over the divide into the Yellowstone Valley as far as Coalpit Creek and returning by way of Traill Creek (altitude 7000 feet) and Bear Creek. A number of species were found breeding at that time, as well as young birds observed.

Another excursion, extending from August 1 to October 3, was made up the Gallatin, with stops at Bear Creek (5800 feet), Spanish Creek (5400 feet), Squaw Creek (5600 feet), Gallatin Cañon (the stream is about 6000 feet with abrupt walls and receding ridges rising to 7000 and 8000 feet), West Fork of the Gallatin (6500-9000 feet), Lower Basin (6000-8000 feet), Middle Basin (7000-9000 feet), Taylor's Fork, also called Dodge Creek (7000-9500 feet), and Big Horn Peak (10,000 feet).

Still another excursion, extending from August 5 to September 27, started from Bozeman, with stops at Reese Creek (5400 feet) in the northern portion of the Gallatin Valley, East Gallatin River near Hillsdale (4600 feet), Pass Creek near Flathead Pass in the Bridger Range (about 5000 feet), head of Dry Creek at north end of Bridger Range (5500 feet), Gallatin Station (4000 feet), Jefferson River near Three Forks (4000 feet), Madison River near Willow Creek (4600 feet), camp in the valley between the Madison and Gallatin Rivers (4600-5500 feet), Fort Ellis, and Mystic Lake. The first two trips, occupying the time from July to October 3, were made by Mr. Knowlton in 1890; the third, from August 5 to about the first of October, was made jointly in 1888.

From this hasty itinerary it appears that the area studied extended in elevation from a little over 4000 feet to over 10,000

feet. In the northern and western portions where the elevation was lowest, the land is largely under cultivation. On rising into the foothills thickets of quaking aspen (*Populus tremuloides*) are abundant, extending also into the open valleys as high as 8000 feet. In the southern and eastern more mountainous portion the prevailing forest tree is the black pine (*Pinus murrayana*), which reaches its greatest development on the dryer plateaus between 7000 and 8000 feet, although it is found from the lower altitudes (5500 feet) up to 9500 feet. The Douglas or red fir (*Pseudotsuga douglassii*) is found up to 9000 feet, generally scattered over the dryer grassy ridges and slopes where it forms loose groves. *Pinus flexilis* is also common on dry gravelly ridges from 6000 feet to about 8000 feet. Next to the black pine the balsam (*Abies subalpina*) is most abundant and widest in distribution, being found throughout in cool, moist situations, at low elevations on the northern slopes, and especially common on wet subalpine slopes above 8000 feet. Little less abundant and occupying approximately the same situations is the spruce (*Picea engelmanni*).

The observations recorded are far from exhaustive, for they were made in the midst of other engrossing duties which demanded first attention. They record simply what we were able to note in the time at our disposal. We had hoped that our observations might be supplemented by additional and more detailed work, but as there appears no prospect of this, we present the notes in the hope that they may be of assistance to future students of the bird life of this region.

Of the list of 111 species, specimens were obtained of 93 of them, represented by nearly 700 specimens.

In addition to these we saw several large Owls (*Bubo?*), not satisfactorily identified; some Hawks, and smaller birds, names not determined, and which are therefore not given a place in the list.

The following species mentioned by Mr. Geo. Bird Grinnell¹ were not met with by us:—

¹ War Department—Report of a Reconnaissance from Carroll, Montana Territory, on the Upper Missouri, to the Yellowstone National Park, and return, made in the Summer of 1875. By Wm. Ludlow. Washington, Government Printing Office, 1876. Zoölogy by Geo. Bird Grinnell. Birds, pp. 72-92.

Tachycineta thalassina. VIOLET-GREEN SWALLOW.—“Very numerous about Fort Ellis.”

Spizella monticola ochracea. TREE SPARROW.—“Three or four seen in Bridger Mountains early in September.”

Totanus flavipes. YELLOW-LEGS.—“A few seen near Fort Ellis.”

Tringa minutilla. LEAST SANDPIPER.—“Only observed near Fort Ellis, where it was abundant early in September.”

Tringa bairdii. BAIRD'S SANDPIPER.—“Flocks of 50 or 60 noticed at Fort Ellis and Gardiner's Springs.”

Gallinago delicata. WILSON'S SNIPE.—“One seen near Fort Ellis.”

From Dr. Merriam's report¹ we quote:—

Gallinago delicata.—“Shot at Fort Ellis July 9, 1872.”

Surnia ulula caparoch.—“Shot on Madison River, Montana, August 11, 1872.”

This last was, however, taken beyond the limits of the present paper.

Attention should also be called to the notes on Montana birds by Mr. Robert S. Williams in former numbers of ‘The Auk’,² and to those of Capt. P. M. Thorne.³ These papers refer to localities somewhat beyond the limits set in the present paper, but may be consulted with profit by the student of the birds of this region.

In conclusion we desire to acknowledge the greatest assistance from Dr. A. C. Peale, then of the U. S. Geological Survey, by whose kindness the observations here presented were made possible.

1. *Larus californicus*. WESTERN GULL.—One was seen on the Jefferson River, about September 15.

2. *Merganser serrator*. RED-BREASTED MERGANSER.—Noted several times during August and September in flocks of from four to twenty.

3. *Anas boschas*. MALLARD.—Very common.

4. *Anas carolinensis*. GREEN-WINGED TEAL.—Frequently seen in small numbers on the tributaries of the rivers.

¹ Sixth Annual Report of the United States Geological Survey of the Territories, for 1872. Washington, Government Printing Office, 1873. Reports on Mammals and Birds by C. Hart Merriam. Birds, pp. 670-715.

² The Auk, III, 1886, p. 274; V, 1888, pp. 14-18; VII, 1890, pp. 292, 293, etc.

³ Ibid., VI, 1889, p. 336.

5. *Branta canadensis*. CANADA GOOSE.—One small flock of six seen on the Madison River late in September. During our stay in the vicinity, this flock was noticed each morning as it passed by to some feeding grounds up the river, and again on its return at night.

6. *Botaurus lentiginosus*. AMERICAN BITTERN.—Several seen.

7. *Ardea herodias*. GREAT BLUE HERON.—Rather common.

8. *Porzana carolina*? SORA.—A small Rail was seen in a marshy tract on the East Gallatin, about the middle of August, that we refer with little doubt to this species.

9. *Phalaropus lobatus*. NORTHERN PHALAROPE.—Four specimens were shot at a mountain pool, in September.

10. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—Rather common in September. Several specimens obtained in this region appear to be somewhat paler than eastern examples, accompanied by slight differences in size.

11. *Totanus solitarius cinnamomeus*. WESTERN SOLITARY SANDPIPER.—Found in September along the smaller streams, usually in pairs.

12. *Symphemia semipalmata inornata*. WESTERN WILLET.—One pair observed, near Moreland, August 19, along a shallow, pebbly stream.

13. *Actitis macularia*. SPOTTED SANDPIPER.—Quite common.

14. *Numenius longirostris*. LONG-BILLED CURLEW.—One individual seen late in August, on the foothills north of the Gallatin Valley.

15. *Ægialitis vocifera*. KILLDEER.—Very common. We frequently came upon them crouching close to the ground, as if to escape detection, and on such occasions were almost in the midst of a flock of twenty or so before aware of their presence.

16. *Dendragapus obscurus*. DUSKY GROUSE.—Very common in the mountains and in well-wooded ravines in the foothills. A single specimen preserved is not quite typical.

17. *Bonasa umbellus*, SUBSP.—A Ruffed Grouse was shot on Taylor's Fork, but not preserved.

18. *Pediocætes phasianellus campestris*? PRAIRIE SHARP-TAILED GROUSE.—Very common in the valleys. A head and wing saved for identification are doubtfully referred to this subspecies.

19. *Centrocercus urophasianus*. SAGE GROUSE.—Abundant throughout the valleys, in the patches of sage brush (*Artemisia*).

20. *Zenaidura macroura*. MOURNING DOVE.—Very common. An unfledged young bird was found on a hillside August 31.

21. *Cathartes aura*. TURKEY VULTURE.—Common.

22. *Circus hudsonius*. MARSH HAWK.—Common.

23. *Accipiter atricapillus*. AMERICAN GOSHAWK.—Three seen, one of which was shot but not preserved.

24. *Accipiter velox*. SHARP-SHINNED HAWK.—One specimen secured.

25. *Buteo borealis calurus*. WESTERN RED-TAIL.—Quite common.

26. *Buteo swainsoni*. SWAINSON'S HAWK.—About as numerous as the preceding.

27. *Aquila chrysaetos*. GOLDEN EAGLE.—Quite common. Parties of three or four, apparently old birds with their offspring, were often seen circling about high overhead.

28. *Falco richardsonii*. RICHARDSON'S MERLIN.—One shot September 23, on the Madison River, was the only one identified. Its stomach contained the remains of a Lincoln's Sparrow.

29. *Falco sparverius*. SPARROW HAWK.—Abundant. Its food here is mainly grasshoppers.

30. *Pandion haliaëtus carolinensis*. AMERICAN OSPREY.—Rather common.

31. *Asio wilsonianus*. AMERICAN LONG-EARED OWL.—Frequently noted along the Jefferson River in heavy thickets. A specimen shot here was found to have a long, slender, thread-like worm under its tongue, similar to those found infesting the fish of the Jefferson River. The presence of one of these parasites in the Owl would indicate an occasional fish diet for that bird.

32. *Ceryle alcyon*. BELTED KINGFISHER.—Very common along all the streams. Several were noted at Mystic Lake. At our camp on the Jefferson River we found the fish infested with long, slender white worms, which were coiled up in the flesh on the sides of the back. A Kingfisher shot at this camp was also found to be infested with these worms, seven of which (some of them nearly a foot in length) were found among (not *in*) its intestines.

33. *Dryobates villosus hyloscopus*. CABANIS'S WOODPECKER.—One specimen secured.

34. *Dryobates pubescens oreæcus*. MOUNTAIN DOWNY WOODPECKER.—Two specimens taken.

35. *Picoides arcticus*. ARCTIC THREE-TOED WOODPECKER.—Rare; one taken in the Gallatin Basin, August 29.

36. *Picoides americanus dorsalis*. ALPINE THREE-TOED WOODPECKER.—Two specimens secured on the Gallatin River, August 24, altitude about 7200 feet.

37. *Sphyrapicus varius nuchalis*. RED-NAPED SAPSUCKER.—Several collected from July to September. Breeds.

38. *Sphyrapicus thyroideus*. WILLIAMSON'S SAPSUCKER.—Rather uncommon at Traill Creek and Gallatin Basin, where three immature birds, evidently raised in the vicinity, were secured August 28–September 3.

39. *Melanerpes torquatus*. LEWIS'S WOODPECKER.—Common in the mountains and foothills, in tracts of dead timber.

40. *Colaptes cafer*. RED-SHAFTED FLICKER.—Common. Regardless of its color it is known to some of the residents as "Yellowhammer."

41. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.—Very common. These birds were often seen on foraging expeditions during midday, in flocks of twenty or more. Most abundant in the valleys.

42. *Stellula calliope*. CALLIOPE HUMMINGBIRD.—Two individuals were noted, one of which, an immature bird, was obtained August 12, at Bear Creek.

43. *Tyrannus tyrannus*. KINGBIRD.—Common.

44. *Sayornis saya*. SAY'S PHOENIX.—Two specimens secured, and these were the only ones seen.

45. *Contopus borealis*. OLIVE-SIDED FLYCATCHER.—One shot on Traill Creek, July 28.

46. *Contopus richardsonii*. WESTERN WOOD PEWEE.—Taken on Spanish Creek about the middle of August.

47. *Empidonax minimus*. LEAST FLYCATCHER.—One specimen secured on Bear Creek, August 13; this is an adult female, and is clearly referable to the above species.

48. *Empidonax hammondi*. HAMMOND'S FLYCATCHER.—Three immature birds were secured on Squaw Creek, August 19-20.

49. *Empidonax wrightii*. WRIGHT'S FLYCATCHER.—Quite common; found usually in wooded ravines in the foothills. Fully fledged young birds were found throughout the month of August.

50. *Otocoris alpestris arenicola*. DESERT HORNED LARK.—Very abundant everywhere in the valleys and on the foothills. Many young in the nestling plumage were found during August. The old birds at this time were in worn and faded plumage, and moulting. About September 20 large numbers of Horned Larks began to arrive from the north, and we noted hundreds of them daily. Over sixty specimens were preserved, and all of them are referable to the subspecies *arenicola*, although a few, obtained from the ranks of the migratory flocks arriving late in September, approach *O. a. merrilli* in the possession of a yellowish edging to the black crescent on the breast. The subspecies *leucolæma* had apparently not arrived by the first of October, at which time our observations ceased, but we have received numbers of this form from the vicinity of Bozeman in midwinter.

51. *Pica pica hudsonica*. AMERICAN MAGPIE.—Very abundant, but shy. Most numerous in the valleys, but noted also in the mountains. Several seen at Mystic Lake.

52. *Cyanocitta stelleri annectens*. BLACK-HEADED JAY.—Only occasionally seen in the mountains. Three were seen near the upper end of Gallatin Basin, at an altitude of about 9000 feet. Adults and young secured.

53. *Perisoreus canadensis capitalis*. ROCKY MOUNTAIN JAY.—Very common in the mountains from the lowest limit of the coniferous forests up to at least 9000 feet, above which altitude we did not have occasion to go. These birds were known locally by a variety of names, such as Meatbird, Meathawk, Campbird, Camprobber, and by others who had known the bird in Colorado, they were called Baldhead, Tallowhead and Whitehead. Immature birds with traces of the dark first plumage were found at Mystic Lake July 27.

54. *Corvus americanus*. AMERICAN CROW.—Abundant and very tame. There was a Crow roost in the mountains, about five miles south of Fort Ellis, and fully five hundred Crows passed over our camp morning and evening to and from this roost. During the day they were scattered over the Gallatin Valley. They appeared to be rather less noisy than eastern Crows and so unusually tame that one could approach them at any time within easy gun range, without resort to strategy.

55. *Nucifraga columbiana*. CLARKE'S NUTCRACKER.—Common in the mountains, and occasionally found on some of the higher foothills, where we saw them at an elevation of about 6000 feet. At Mystic Lake we saw one of these birds soaring in circles, like a hawk, with its white tail fully spread. One shot on Traill Creek was found to have eighty-two piñon seeds in its gullet.

56. *Dolichonyx oryzivorus*. BOBOLINK.—Very common at one place in the northern part of Gallatin Valley, where, about the middle of August, we found a large number in a rank growth of wild sunflowers (*Helianthus*). This was in close proximity to, and in fact to some extent adjoining, a considerable tract of nearly ripe oats. Although the birds were swarming in the former, we found only a few stray birds in the latter field.

57. *Molothrus ater*. COWBIRD.—An immature individual shot about the middle of August was the only one observed.

58. *Sturnella magna neglecta*. WESTERN MEADOWLARK.—Abundant.

59. *Icterus bullocki*. BULLOCK'S ORIOLE.—No birds of this species were seen, but a nest no doubt belonging to this Oriole was found in some willows on the East Gallatin.

60. *Scolecophagus cyanocephalus*. BREWER'S BLACKBIRD.—Very abundant, especially in the fall, when these birds were seen in flocks of thousands. During August we met with them usually in small numbers about the ranches and cowpens, and occasionally scattered along the roadside, resting in the shadows of the fenceposts from the heat of midday.

61. *Pinicola enucleator*. PINE GROSBEAK.—Occasionally observed. One was shot at Mystic Lake in the latter part of September, and another in July on Traill Creek, where it breeds.

62. *Loxia curvirostra minor*. AMERICAN RED CROSSBILL.—About a dozen seen in Gallatin Basin in September.

63. *Spinus tristis*. AMERICAN GOLDFINCH.—Common.

64. *Spinus pinus*. PINE SISKIN.—Rather common on the foothills, where it breeds. A fully fledged young bird was shot late in August.

65. *Poocætes gramineus confinis*. WESTERN VESPER SPARROW.—Very common, especially in the fall.

66. *Ammodramus sandwichensis alaudinus*. WESTERN SAVANNA SPARROW.—Abundant. First noted about the last of August.

67. *Ammodramus savannarum perpallidus*. WESTERN GRASSHOPPER SPARROW.—One bird, presumably this form, was seen in the Gallatin Valley.

68. *Chondestes grammacus strigatus*. WESTERN LARK SPARROW.—A few seen during August, when two immature birds were obtained.

69. *Zonotrichia leucophrys intermedia*. INTERMEDIATE SPARROW.—Very common in the valleys after the first of September. Breeds in the mountains, where it was noted on Traill Creek in July.

70. *Spizella socialis arizonæ*. WESTERN CHIPPING SPARROW.—Common.

71. *Spizella breweri*. BREWER'S SPARROW.—Commonly found in rocky ravines among the foothills, in stubby pines and brush.

72. *Junco hyemalis shufeldti*. SHUFELDT'S JUNCO.—Three specimens of this form were taken at Taylor's Fort (alt. 7500 feet), September 7 and 8.

73. *Junco annectens*. PINK-SIDED JUNCO.—Commonly found in the valleys after the first of September. It was more abundant in the mountains, where it breeds. Young birds were taken at Mystic Lake late in July.

74. *Melospiza fasciata montana*. MOUNTAIN SONG SPARROW.—Very common.

75. *Melospiza lincolni*. LINCOLN'S SPARROW.—Rather common. Noted in the valleys, where several specimens were secured in the early part of September. A *Falco richardsonii* shot September 23 had the remains of one in its stomach. It breeds in the mountains, where, at Traill Creek, a young bird was secured July 29.

76. *Pipilo maculatus arcticus*. ARCTIC TOWHEE.—Quite common in ravines leading into the foothills. Young birds noted in August.

77. *Pipilo chlorurus*. GREEN-TAILED TOWHEE.—Uncommon, in situations similar to that of the preceding.

78. *Habia melanocephala*. BLACK-HEADED GROSBEAK.—Several noted, including young birds hatched in the vicinity.

79. *Passerina amœna*. LAZULI BUNTING.—Quite common in the valleys and foothills; breeds.

80. *Piranga ludoviciana*. LOUISIANA TANAGER.—A few seen in September at the lower elevations. Noted common and breeding at Mystic Lake late in July.

81. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Quite common.

82. *Chelidon erythrogastra*. BARN SWALLOW.—Abundant. We found them gathered in long strings on the telegraph wires early in September.

83. *Tachycineta bicolor*. TREE SWALLOW.—Common. A colony noted about the middle of August in a clump of cottonwoods, where the old birds were still feeding young.

84. *Clivicola riparia*. BANK SWALLOW.—Common; young birds barely able to fly were observed after the middle of August, and some of the nests were apparently still occupied. It may be interesting to note in this connection that in the neighborhood of Washington, D. C., at this date, the resident Bank Swallows have long since finished nesting and

left the vicinity of their breeding grounds to gather in larger squads on the marshes of the Potomac, and many of them have, even by the middle of July, begun to migrate down the river. Migratory birds are, however, noted in the vicinity of Washington through most of September.

85. *Ampelis cedrorum*. CEDAR WAXWING.—Common.

86. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.—Common in the valleys. A single Shrike was also noted in the mountains in September. It was very likely *L. borealis*.

87. *Vireo gilvus*. WARBLING VIREO.—Common in the willows and cottonwoods along streams in the valleys.

88. *Helminthophila celata*. ORANGE-CROWNED WARBLER.—Two specimens were secured at low elevations September 2 and 15.

89. *Dendroica aestiva*. YELLOW WARBLER.—Common.

90. *Dendroica auduboni*. AUDUBON'S WARBLER.—Very common during September both in the mountains and in the valleys. Breeds in the mountains; numbers were observed at Mystic Lake late in July.

91. *Geothlypis macgillivrayi*. MACGILLIVRAY'S WARBLER.—Common; breeds.

92. *Geothlypis trichas occidentalis*. WESTERN YELLOW-THROAT.—Very common.

93. *Sylvania pusilla pileolata*. PILEOLATED WARBLER.—Very common from the middle of August until late in September, in the valleys.

94. *Setophaga ruticilla*. AMERICAN REDSTART.—Common in the valleys.

95. *Anthus pensilvanicus*. AMERICAN PIPIT.—Very common in the fall. This species made its appearance toward the end of September, mingling freely with the Horned Larks, which were arriving in large numbers at that time.

96. *Cinclus mexicanus*. AMERICAN DIPPER.—Generally distributed in the mountain region.

97. *Oroscoptes montanus*. SAGE THRASHER.—One immature bird secured, and another seen at low elevations.

98. *Galeoscoptes carolinensis*. CATBIRD.—Common in the valleys.

99. *Salpinctes obsoletus*. ROCK WREN.—Quite abundant. Young birds were plentiful during August.

100. *Troglodytes aëdon aztecus*. WESTERN HOUSE WREN.—Common. A nest found in a dead stump in a cottonwood thicket August 13, contained four half-fledged young.

101. *Certhia familiaris montana*. ROCKY MOUNTAIN CREEPER.—A specimen shot September 23, in Jefferson Valley, was the only one seen.

102. *Sitta carolinensis aculeata*. SLENDER-BILLED NUTHATCH.—Uncommon; but found breeding at several places in the mountains.

103. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Two specimens obtained at low elevations in September. These specimens, and others from the Mississippi Valley westward, are somewhat brighter on the under-

parts than average eastern birds. There appears to be no difference in size.

104. *Parus atricapillus septentrionalis*. LONG-TAILED CHICKADEE.—Very abundant along the streams in the valleys, travelling about in small troops in the cottonwoods and willows.

105. *Parus gambeli*. MOUNTAIN CHICKADEE.—Common in the mountains, and extending down on the foothills as far as coniferous trees occur. The hoarse, drawling note of this bird is easily distinguished from the energetic one of the preceding species. After the middle of September we found them sparingly in the valleys, associating with flocks of the Long-tailed species.

106. *Regulus satrapa olivacea*. WESTERN GOLDEN-CROWNED KINGLET.—Breeds in the mountains. An immature bird just leaving the nestling plumage was secured August 28. The species was quite common in the vicinity of Mystic Lake about the last of September, but no individuals were seen at any time in the valleys.

107. *Regulus calendula*. RUBY-CROWNED KINGLET.—Common during September in the valleys. It was not noted in the mountains.

108. *Turdus ustulatus swainsonii*. OLIVE-BACKED THRUSH.—Several specimens collected are referable to this form. Young birds in first plumage were secured July 27, at Mystic Lake, and August 27, at the north end of Gallatin Valley.

109. *Turdus aonalaschkæ auduboni*. AUDUBON'S HERMIT THRUSH.—Several obtained. A young bird in nestling plumage was secured July 27, at Mystic Lake. An adult was taken September 11, at an elevation of 8500 feet.

110. *Merula migratoria propinqua*. WESTERN ROBIN.—Common in the valleys, and also noted in some numbers in the mountains.

111. *Sialia arctica*. MOUNTAIN BLUEBIRD.—Common; breeds. Found migrating in small flocks during September.

Too late for insertion in its proper place in the list, we find that an immature specimen of the Rough-winged Swallow (*Stelgidopteryx serripennis*) was collected by us near Hillsdale, in Gallatin Valley, August 22, 1888. The bird was doubtless raised in the vicinity. This appears to be somewhat north of its usual range.



JOHN JAMES AUDUBON.
[1850.]

THE LAST PORTRAIT OF AUDUBON, TOGETHER
WITH A LETTER TO HIS SON.

BY DR. R. W. SHUFELDT AND MISS M. R. AUDUBON.

Plate IX.

It is the celebrated artist Cruikshank to whom the honor is due for having made the first published portrait of America's well-beloved ornithologist — Audubon. The naturalist at that time was about forty years of age and the picture, now destroyed by fire, was a miniature. Inman also succeeded in obtaining a fine portrait of him, which is the one that was reproduced in his *Biography*. His son John secured still another, one of the most valuable now in existence, it being a full-length with his favorite dog at his feet. These three portraits have been published and republished as engravings at various times and in various places, so that they are now well-known to all the many readers of *Audubonian* literature. A thus far unpublished and another greatly cherished portrait of the naturalist has been described in *'Scribner's Magazine'* for July, 1876 (p. 335). This, too, was painted by the fond hand of the same son who painted the full-length picture, to which we have referred above. Finally, by the aid of a mirror, Audubon made a small oil-painting of himself, and this picture has already been reproduced in the pages of the present magazine, with a description of it.¹ By those who have seen it, and by members of the family, his immediate descendants, this last has been pronounced an excellent likeness. The original is the property of Mrs. E. C. Walker, of Baton Rouge, La., and is the earliest portrait of the naturalist known to us.

It is now the aim of the authors of the present contribution to bring before the many readers of *'The Auk'* what proves to be a portrait of Audubon heretofore not given to the world. In one way, at least, it is of greater value and interest than any of the other portraits extant, — priceless as they really are. The

¹*'The Auk,'* Vol. III, No. 4, October, 1886, pp. 417-420. The portrait was awarded the frontispiece.

special superiority claimed for it lies in the fact, that it is a *camera-portrait*, and consequently portrays its every line true to life. It was not so very long ago when one of the writers of this article discovered in the possession of Professor T. W. Smillie, the well-known photographer of the United States National Museum of Washington, a daguerreotype of Audubon, that belonged to Mrs. Grimshaw, a daughter of Mrs. Nicholas Berthoud, and a niece of Mrs. Audubon's, who had placed the treasure on deposit in the above-named institution. Mrs. Grimshaw kindly consented to our having a photographic copy made of this daguerreotype, which was accomplished through the consummate skill of Professor Smillie, and with the courteous permission of Doctor G. Brown Goode, the distinguished officer in charge of the National Museum. From this excellent photograph has been made the admirable plate which illustrates the present paper. A picture so fine as this one surely requires no comments on the part of its contributors to 'The Auk'; it has but to be seen by any of its readers to be admired. From all that we have been able to gather, it would seem that this daguerreotype was taken by Brady of New York City some time during the summer of 1850. As the naturalist was born, as near as we have been enabled to ascertain the date, some time in May, 1780, and died on the 27th of January, 1851, this picture must have been obtained when he was in the seventieth year of his age, and at a period only a few months prior to his death. With the view of obtaining as full a history of it as possible, we recently placed ourselves in communication with the Rev. Dr. A. Gordon Bakewell of New Orleans, La., one of the most charming of the old-school divines of the Episcopal church, who is a son of Thomas Bakewell, and was a favorite cousin of the late John Woodhouse Audubon, the father of the co-author of the present article.

Doctor Bakewell writes us that Mrs. Gordon, one of Mrs. J. J. Audubon's sisters, just before her death, presented the daguerreotype to Mrs. Grimshaw, and that the former received it direct from the wife of the naturalist. "It was the last picture taken from life shortly before Mr. Audubon died, and it certainly is very like him, when I last saw him toward the latter end of his earthly journey."

These quoted words of Doctor Bakewell's complete, in so far as facts go, all we have been enabled to gather in regard to the actual history of this portrait. In placing it here, we not only give ourselves great pleasure, but we do more, for we add still another to the list of the published portraits of that one of this country's celebrated naturalists whose fame augments *pari passu* with the march of time.

Standing next in value to published Audubonian portraits are published Audubonian letters, and we feel that it hardly requires any apology from us, when we say that we know of no more fitting way to conclude this article than by adding to it a hitherto unpublished letter of Audubon's, addressed to his son John W. Audubon, 4 Wimpole Street, Cavendish Square, London. It will be seen upon perusal that this letter is brimful of interest, both of a personal and an historical nature. It reads as follows:—

“*Edinburgh, July 1st, 1838, Sunday.*

“MY DEAREST FRIENDS

“Your joint letter of the 27th Wednesday, did not reach me until yesterday afternoon, probably because the steamer which brought it did not leave London on that evening on $\frac{9}{10}$ of the coronation etc., Here the festivals were poor beyond description, and although scarcely anything was to be seen, the whole population was on foot the entire day, and nearly the whole night, gazing at each other like lost sheep.—No illuminations except at two shops, Mr. Henderson's and another close by him.—The fireworks at the castle consisted merely of about one hundred rockets, not a gun was fired from the batteries. Mac-Gillivray & I went to see the fireworks at 10 P. M, and soon returned disgusted.—His museum (College of Surgeons) and the Edinburgh Museum were thrown open *gratis*, and were thronged to excess. Upwards of 20000 in the first, and about 25000 in the other; all was however quite orderly. The day was showery; cloudy and dismal at times, but the evening was clear and fine.—Mr. Hill's father died on the morning of the 27th and I have not seen Alex. H., since. Many thanks to Maria for her bunch of letters, and the few lines of her own to me, I hope that everything will go on well with you all.

“We begin printing *tomorrow 2d of July, 1838!!* remember that Mesdames et Messieurs! and I intend to proceed with all possible despatch and care. *All* the birds in rum will be inspected as far as internal or digestive organs, trachea &c are concerned, and as I am constantly present in the dissecting room, I think I shall know something about the matter anon.—I am almost in hopes to see Victor tomorrow night but cannot be sure. There are somewhere at home the nests of the birds found on the Columbia by Nuttall and Townsend, I believe that of Bewick’s Wren is among them; send them *all*, very carefully packed. I want the journal of my first trip to the Floridas, which was cut out of my large leather journal, previous to going to Labrador, also a letter on the habits of the Yellow-bellied Cuckoo, by a gentleman at Charleston. If it cannot be found perhaps Maria will recollect his name, being a friend of John Bachman, if so send me that, *in full*, if possible. It is the gentleman in whose garden I procured the small and large cuckoos in the same nest.—

“I have written fortyfour articles for my appendix and will continue whenever I am not otherwise engaged, so as to save time at last.—I am sorry for the death of poor Wickliffe but glad that his brother was with him at New York previously, and that we, at least, have done all we could for him. MacGillivray is quite well, and works very hard, poor fellow—I am glad of John’s repainting the head by VanDyke, two copies of such heads are valuable to him, besides his improving by so working—When Victor has left for this place, John must pay much attention to the colourers and call also on the book binder. Havell ought to exert himself in having some 4th vols; delivered as soon as possible.

“My last letter which was written last Sunday, was put too late in the office, which closed on that day at two o’clock, and did not therefore leave this till four o’clock on Monday afternoon; this one will have a better chance, for I will take it myself to the general office. I have seen no one hardly since my last, I am indeed as busily engaged as ever, and rarely go to bed before eleven—being with Mr. MacGillivray until generally past ten, describing etc., I rise at four or earlier, he at ten; but I go to bed at eleven, he at two. I discovered that he was adverse to the examination of the intestinal canals etc.,

because many of my birds which are common to both countries will be published before his 2d vol., can now possibly be; but as soon as I told him that I had already said in my introduction, that the anatomical structure was declared to be *his*, he was much pleased and began on the instant.

“Today is very dismal, and it will rain probably until night; I wish we had here some of the warm weather of which dearest Mamma speaks. I have had but one walk to Arthur’s Seat, but now and then I stroll to the meadows which are close to me, and now look well.—From the window of my sitting room I overlook the garden of Mr. Frazer our printer, and now and then speak to him there, I have not yet however visited him.—I will recollect the Queen’s farthing when next I see Professor Wilson, but doubt much if he will recollect the least idea of it. Has Charley written or said anything to Victor about the review of the work; remember me to Healey.—

“I suppose that the crown of England sits very quietly down, and that all was very superfine. I have not so much as seen a paper since I left you.

“God bless you all, dearest friends, take good care of Mamma and Maria.

“Ever your firmly attached father and friend

“J. J. AUDUBON.

“*No. 7 Archibald Place,
Lauriston.*”

Up to the present time there has been no personal letter of Audubon’s published which so clearly shows, as this one does, the precise relations between Macgillivray and himself. Although it testifies to the fact that the former is entirely responsible for the anatomical descriptions of ‘The Birds of America,’ it likewise goes to show that Audubon took a lively and personal interest in a great many of those dissections, and, in all probability, was often at Macgillivray’s side while they were being made, — not as a mere looker-on, but to follow him with that keen intelligence during their progress which characterized his every undertaking in the science he loved so well, and in which he has made a name as enduring as the great truths in the foundation upon which modern ornithology itself is reared.

RECENT LITERATURE.

Mrs. Wright's 'The Friendship of Nature.'—Although not a 'bird book' in a strictly ornithological sense, Mrs. Wright's 'The Friendship of Nature'¹, as its subtitle—'A New England Chronicle of Birds and Flowers'—indicates, deals with birds to a sufficient extent to warrant reference to her charming book in the pages of 'The Auk.' If no new facts in bird life are 'chronicled,' her frequent allusions to birds have a poetic setting and a background that render her book one of unusual literary merit and peculiarly fascinating to every lover of nature. The book consists of eleven chapters, nearly all for the first time here published. Some hint of the method of treatment may be gathered from the titles as follows: 'A New England May-Day'; 'When Orchards Bloom'; 'The Romaunt of the Rose'; 'The Garden of the Sea'; 'A Song of Summer'; 'Feathered Philosophers'; 'Nature's Calm'; 'The Story of a Garden'; 'Rustling Wings'; 'The Loom of Autumn'; 'A Winter Mood.'

The author easily takes first rank as a poet of nature, her book being truly a poem in prose. In general her allusions to the varied objects of nature, whether animals or plants, or things inanimate, are wonderfully truthful and show not only keen powers of observation but broad culture. The twelve illustrations are most happily chosen and exceedingly well reproduced in photogravure.² We consider that we do our readers a favor in calling attention to the intellectual treat the book offers to those in friendship with nature.—J. A. A.

Shufeldt's 'Comparative Oölogy of North American Birds.'³—In a paper of somewhat over 30 pages, Dr. Shufeldt attempts "to bring together what is already well known in regard to the oölogy of North American birds, placing it before the ornithologist in a more condensed form than it is usually given and in a comparative way." Much of this is 'placed' in the form of comparative tables, compiled mainly from Coues's 'Key' and Ridgway's 'Manual.' Much stress is here and there laid upon the "discrepancies" found in the descriptions of different authors

¹The Friendship | of Nature | A New England Chronicle of Birds | and Flowers | By | Mabel Osgood Wright | With Twelve Full-page Illustrations | from Photographs by the Author | New York | Macmillan and Company | and London | 1894 | All rights reserved.—8vo. pp. viii + 238. 12 photogravure illustrations.

²The work appears, however, in two editions, the smaller in ordinary 12mo. size, with merely a frontispiece. The larger, or 'large paper' edition, is limited, we believe, to 300 numbered copies.

³Comparative Oölogy of North American Birds. By R. W. Shufeldt. Rep. U. S. Nat. Mus. for 1892 (1894), pp. 461-493.

in respect to the number, size, color, and markings of the eggs of the same species of birds. In only rare cases, however, do the discrepancies seem to be important, considering the purposely general character of the statements referred to, and the variability in all these features the eggs of the same species are so well known to present.

In these comparative tables and the accompanying text, we have a convenient summary of the subject, without any claim to the presentation of any new facts, or rarely any new generalizations. In the matter of the latter, and in the way of general statements respecting the character of the eggs and the nesting habits of many of the higher groups, quotations are freely made from the writings of Professor Newton and Dr. Sharpe.

Very little attempt is made to use the facts of oölogy in a taxonomic sense, beyond what has been done by previous authors, where in a few cases, as pointed out by Newton, they may be employed to advantage. Yet the fact remains that birds of certain groups, as genera or families, in all other respects closely related, vary greatly as to the number, shape, and coloration of their eggs, and in nesting habits. We have here, however, apparently an expression of our author's latest views on the classification of birds, as respects the affinities of certain ordinal or sub-ordinal groups, as we find the Owls (*Striges*) dissociated from the other Birds of Prey and placed between the Woodpeckers and Goatsuckers; the Hummingbirds stand between the Goatsuckers and the Swifts; and the families of the *Passeres* are very much transposed from their usual order, the Finches (family *Fringillidæ*) following the *Paridæ*, while next in order stand the *Icteridæ*, *Corvidæ*, and *Sturnidæ*, the latter closing the series of *Passerine* birds. We have no doubt, however, that the placing of the "so-called 'grosbeaks'" (p. 484) under the *Icteridæ* is a typographical mishap, as the paper contains at various other points evidence of careless proofreading.

Near the close of the paper we have various quotations from Newton, of some general statements about birds' eggs, particularly as to the manner of deposition of the shell-markings, which are, however, not quite in accord with Dr. Gadow's recent statements on the same subject (see Newton's *Dictionary of Birds*, Art. 'Embryology,' pp. 197, 198). We have again a restatement, in substance, of Wallace's well-known ideas, especially as elaborated by Dixon, respecting the coloration of birds' eggs in relation to the color of the birds themselves and the character of the nest in which the eggs are placed; and, under 'Concluding Remarks' (pp. 487-493), an attempt to correlate "some of the oölogical peculiarities of the birds of North America" with these generalizations. The concluding paragraph of the paper is devoted to suggestions as to how to study and describe the eggs and nesting habits of birds, which, like the paper as a whole, scarcely rise above the plane of the common place, being designed perhaps rather for the beginner than for the advanced investigator.—J. A. A.

Shufeldt's 'Scientific Taxidermy for Museums.'¹—This memoir is presented by Dr. Shufeldt as the result of studies of mounted specimens largely in the collections of the United States National Museum, made by him at the request of the authorities of that Institution. As an expert whose opinion could be considered authoritative, he was desired to make a critical examination of the specimens of taxidermy displayed "in the National Museum and Smithsonian Institution" and to suggest plans for further improving exhibits of this nature.

Dr. Shufeldt's essay opens with a general review of the taxidermist's profession and its requirements. He compares the old with the 'New Taxidermy' and, in our opinion, rightly claims for the latter a place among the arts. Then follows a detailed consideration of many examples of the taxidermist's skill, including representatives of Invertebrates, Fishes, Reptiles, Birds, and Mammals. This part of the paper, covering 48 pages, is very fully illustrated by 82 full-page half-tone plates from photographs of the specimens described and commented upon.

Dr. Shufeldt's remarks are timely. The day has arrived when the work of the artist-taxidermist should receive the attention it deserves. The day has passed when the name taxidermist can be applied to the whole group of animal stuffers and mounters, from the village barber, who 'sets up' a pet cat or canary, to the expert modeller of a bison.

It is only within comparatively recent years that taxidermy could rightly claim rank as an art. Its development is in part due to the cumulative agency of transmitted experience, but more especially to the establishment of departments of taxidermy in our large museums. Here, secure of a salary which is in no way affected by the amount of work performed, the artist-taxidermist can give full scope to his originality. Patience and an unlimited amount of time are absolutely necessary adjuncts of the higher class of taxidermy. For this reason, even when other things are equal, the commercial taxidermist cannot compete with the museum worker. If the former should devote one half the time to his subjects that the latter conscientiously gives to his, he would become bankrupt. His customers, the public, are not educated to a proper appreciation of truly artistic taxidermy and they are therefore given no more than their money's worth. In other words, they pay a low price for an inferior class of work.

Dr. Shufeldt is therefore to be thanked for his clear exposition of the differences which exist between the trade and the art of taxidermy. Let us hope his words will so open the eyes of the public to the merits of this new art that a taxidermist may feel warranted in establishing a studio whose patrons shall not be purchasers of rugs and feather screens, but in a strict sense patrons of the arts.—F. M. C.

¹Scientific Taxidermy for Museums (Based on a Study of the United States Government Collections). By R. W. Shufeldt, M. D. Report U. S. Nat. Mus. (for 1892), pp. 369-436. Pl. xv-xcvi. Washington, 1894.

Stone's Revision of the Genus *Anous*.¹—Mr. Stone recognizes seven species of the genus *Anous*, one of which, *A. atrofuscus*, is described as new, and he has apparently done good service in straightening out the complicated synonymy of the group. A synoptic table is given of the species.—J. A. A.

Stone on the Old World Rallinæ.²—Says Mr. Stone: "Having had occasion to make a thorough investigation of the literature bearing upon the Old World Rails, I think it desirable to prepare the following list of the described species and genera which brings together in one paper all the references to published descriptions. Lack of sufficient material has prevented me from making a monographic study of the group, but where specimens were at hand I have been able to judge of the specific relations of various described forms and to arrange the synonymy accordingly." Mr. Stone's paper was prepared independently of Dr. Sharpe's recent work on the group, as finally set forth in Vol. XXIII of the British Museum 'Catalogue of Birds,' which appeared almost coincidentally with Mr. Stone's paper. Mr. Stone, however, refers to Sharpe's paper on the Rallidæ published in 'The Ibis' in 1893. It is therefore of interest to compare the views of the two authors. The number of genera recognized for this group by Mr. Stone is 23, with 3 additional subgenera; by Mr. Sharpe, 33. Mr. Stone formally recognizes 88 species; Mr. Sharpe, 88,—a remarkable agreement in respect to the number of species admitted. The order of arrangement of the genera is very different in the two publications.

Mr. Stone gives a chronological list of the "generic names which have been proposed for the Old World Rails"—38 in all—from 1758 to 1893, excluding, however, a number proposed by Heine in 1890. In commenting on these names, he states that *Ortygometra* Leach is simply a synonym of *Crex*, though wrongly used in another connection. He disapproves of Mr. Sharpe's recognition of so many generic divisions of the old genus *Porzana*, and considers that while *Zapornia* and *Coturnicops* (= '*Ortygops*' of Sharpe) may stand as subgenera, *Phalaridion* and *Rallites* must be regarded as merely synonyms of *Porzana*. No new names, either generic or specific, appear to be proposed, but two generic names that have been in more or less common use are shown to be preoccupied, and later names are properly adopted in their stead; namely, *Sarothrura* Heine for *Corethrura* Reich.; *Euryzona* Bon. for *Rallina* Reich. nec Gray. The body of the paper consists of a synonymic list of the genera and species, with their habitats, and more or less technical comment on questions of nomenclature.—J. A. A.

¹ A Revision of the Genus *Anous*. By Witmer Stone. Proc. Acad. Nat. Sci. Phila., 1894, pp. 115-118.

² A Review of the Old World Rallinæ. By Witmer Stone. Proc. Acad. Nat. Sci. Phila., 1894, pp. 130-149.

Wallace on 'Palæarctic' and 'Nearctic'.¹—Again Mr. Wallace comes forward in defence of "the six regions established by Dr. P. L. Sclater," which he still claims as "the most natural and convenient" that "have been established." The reason for this is that "of late years," as he says, "many eminent naturalists, both in America and Europe, have proposed other regions, though hardly any two of these agree with each other." While this latter claim may be true, they do practically agree in uniting "the Palæarctic and Nearctic Regions so as to form one new region." To refute this grave heresy is the purpose of Mr. Wallace's present paper, which, in his own opinion, he succeeds in doing in a very satisfactory manner. But we fear he has not succeeded to any great extent in convincing the heretics. He says, most truly, that "the reason why so much difference of opinion exists on this point, when the very same facts are before all the enquirers, seems to be that they treat the facts in different ways." And the way Mr. Wallace here treats them tends most effectually to mislead and obscure the real points at issue; besides, he makes several misstatements that have an important bearing on the case, as will be noted later.

Mr. Wallace thinks that "far too much stress is laid upon the comparatively small number of absolutely peculiar genera or families in the two temperate regions," since, in his opinion, "the facts clearly show that the differences very far surpass the resemblances." In proof of this he tabulates the families and genera of the mammals and the land birds of the two regions, to show which are common to the two and which are peculiar to one or the other. From these tables he educes statistics which, as employed by him, appear to make an excellent showing for his side of the controversy. But to do this he necessarily ignores certain very fundamental facts and principles. No reference is made, for example, to the eminently homogeneous character of the life of the whole northern half of the northern hemisphere, nor to the fact that the differentiation of the two regions—'Palæarctic' and 'Nearctic'—is almost wholly limited to their warmer portions; nor to the fact that quite a percentage of the types given by him as peculiar to one or the other of these regions are merely intrusive forms that extend from the tropics northward just a little way into the southern border of his two regions. Furthermore, as regards especially the mammals, about one-ninth of the genera given as peculiar to either the 'Nearctic' or 'Palæarctic' should be transferred to the column of "common to both regions," as for example three of his six genera of Pinnipeds. Besides, no account appears to be taken of the important fact that in comparatively recent geological times the life of the 'Palæarctic' and the 'Nearctic' was much more closely related than at present.

Mr. Wallace further claims that the differences between the 'Nearctic' and the 'Palæarctic' "are, in fact, fundamental, and are far greater than

¹The Palæarctic and Nearctic Regions compared as regards the Families and Genera of their Mammalia and Birds. By Dr. Alfred Russell Wallace, F. R. S. *Natural Science*, Vol. IV, June, 1894, pp. 435-445.

can be found in the separate halves of any of the other [zoölogical] regions, unless they are so divided as to be very unequal in area or to present very great differences in climate. But the Palæarctic and Nearctic Regions are, roughly speaking, equal in area." As to the latter statement, a glance at a map of these regions shows at once that the land area of the 'Palæarctic' is fully *three times* that of the 'Nearctic.' We are glad to see here, however, a tacit admission that climate may have something to do with the distribution of life. As to the other allegation, if Mr. Wallace will make the same kind of comparison between his Mediterranean and Manchurian 'Subregions' as he makes between his Palæarctic and Nearctic 'Regions,' he will find as high, and probably a much higher, ratio of difference than he so ingeniously figures out for the latter; it being in these areas also, that the chief differentiation of the 'Palæarctic' from the 'Nearctic' occurs. Of course Mr. Wallace would not think of contrasting the northern and southern halves, respectively, of his Nearctic and Palæarctic, owing to the contrast of climate, but should he be induced to do so he would find not only a far greater contrast between them than he now finds between 'Nearctic' and 'Palæarctic,' but that the northern half of the 'Palæarctic' has a far closer resemblance to the northern half of the 'Nearctic' than it has to the southern half of the 'Palæarctic.' (*Cf.* Bull. Am. Mus. Nat. Hist., IV, 1892, pp. 208-211.)

Finally Mr. Wallace works himself up to the claim that the 'Palæarctic' and 'Nearctic' Regions, in comparison with other 'Regions,' "are really exceptionally distinct. They are certainly much more distinct than are the Oriental and Ethiopian Regions, and are probably quite as distinct as are any two conterminous regions." We have already intimated how this conclusion is reached. We will only say in conclusion that we regard the so-called Oriental and Ethiopian 'Regions,' and the Palæarctic and Nearctic 'Regions,' as life areas of the second rank, — not as primary areas, as Mr. Wallace does, — the former together forming an Indo-African Realm, and the latter a North Temperate Realm, both being areas of primary grade, and their components respectively areas of secondary grade. (*Cf.* Bull. U. S. Geogr. and Geol. Surv. Terr., Vol. IV, No. 2, 1878.) Of course, our North Temperate Realm is equivalent to the 'Holarctic' of Newton and some other recent writers, who are unable to see the propriety of longer recognizing the 'Palæarctic' and 'Nearctic' as distinct primary regions. The case of Palæarctic and Nearctic all turns on the question of whether life areas shall be laid out in such a way as to give 'convenient and easily-remembered boundaries,' regardless of other contingencies, or whether they shall be based on the actual conditions of life, and their boundaries be so regulated as to conform to, and illustrate, the facts of geographic distribution.—J. A. A.

Publications Received.—Bendire, Charles. Descriptions of Nests and Eggs of some New Birds, collected on the Island of Aldabra, Northwest

of Madagascar, by Dr. W. L. Abbott. (Proc. U. S. Nat. Mus. XVII, pp. 39-41.)

Chapman, Frank M. The Nocturnal Migration of Birds. (Pop. Sci. Month., August, 1894, pp. 506-511.)

Gurney, J. H. (1) On the Birds of the Farne Islands. (Trans. Norfolk and Norwich Naturalists' Soc., Vol. V., pp. 52-58.) (2) Occurrence of the Tropic Bird in England. (*Ibid.*, p. —.) (3) Irish Rock Birds. (*Ibid.*, pp. 550-555.) (4) Fauna and Flora of Norfolk. Additions to Part XI, Birds. (*Ibid.* pp. 642-649.)

Hancock, Joseph L. Ornithophilous Pollination. (Am. Nat., 1894, pp. 679-683.)

Hinxman, Lionel W., and William Eagle Clarke. A Contribution to the Vertebrate Fauna of West Ross-shire. (Proc. Roy. Phys. Soc. Edinburgh, XII, pp. 377-415.)

Loucks, W. E. The Life History and Distribution of the Prothonotary Warbler in Illinois. (Bull. Illinois State Labr. Nat. Hist., IV, pp. 10-35, and map.)

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GENERAL NOTES.

Oceanodroma townsendi off San Diego, California.—From the time of my introduction to the Sea-birds of Southern California in 1887, I have seen at intervals, a black Petrel, which I quite naturally supposed was *Oceanodroma melania*. They are seen in companies of not more than three, more often solitary, and at quite a distance from land. In August and September, however, they are sometimes seen along the kelp beds near shore and on one or two occasions one was seen in the bay at San Diego, but they never enter the bay except in foggy weather or at night.

July, August and September seem to be the months in which they are most common, though I think I have seen them occasionally nearly all the year.

Owing as much to their extreme restlessness as to their shyness, I could never secure specimens. Not the slightest attention was paid to bait thrown over to them, or to other sea-birds that might be following the boat, therefore the capture of a single specimen off this port on Sept. 1 of the past year was somewhat of a surprise to me.

Starting from the Coronado Islands about 20 miles south of San Diego, on the morning of the above date, I sailed in a westerly direction until noon, when I was about 40 miles from San Diego and almost due west. Several Petrels were seen during the morning but none offered a chance for a shot. *Puffinus gavia* was seen at intervals, but the large flock which is usually to be found in this locality at this season, and which I was in search of, was not to be found. It was decided to look for them nearer shore, and the sloop was headed for San Diego, under a fair but light breeze. When about 30 miles off shore, a flock of not less than 200 Petrels was sighted coming toward the sloop, on a course that would take them about a quarter of a mile south of us. They were flying just above the water in a somewhat loose flock, with a long string of

stragglers reaching half a mile or more behind, all apparently feeding. An attempt was made to intercept the main flock, but owing to the light breeze only the stragglers were overtaken and but one secured. Over an hour was spent in a fruitless attempt to again overtake them, but as they were working directly to windward, and the breeze was very light, we always passed about two gunshots behind the last.

I was unable to discover what they were feeding on, as the specimen secured contained nothing but a reddish oil. All were, however, apparently picking up something from the surface of the water, which appeared to be slightly agitated as by a school of very small fish, or a light wind. Their flight was strongly suggestive of that of the Night-hawk, with this exception, that when pausing to pick up or investigate an object on the water, the wings were held higher and the wing beats considerably increased for the moment. Only a few were seen to alight, and then for an instant only.

With the exception of a few birds which at a distance strongly resembled *Halocyptena microsoma*, all appeared to be like the specimen secured, which Mr. Ridgway has kindly compared with his type of *O. townsendi* and pronounced to be of that species. From my observations I should say that Townsend's Petrel was of regular though perhaps somewhat rare occurrence in deep water as far north as the Santa Barbara Channel.—A. W. ANTHONY, *San Diego, Cal.*

The Canada Goose and Osprey laying in the same Nest.—Mr. Charles de B. Green, who spends a good deal of his spare time in making collections for the Museum, writes me from Kettle River, Okanagan District, British Columbia, to the effect that while climbing to an Osprey's nest he was surprised to find his actions resented by not only the Ospreys but also by a pair of Canada Geese (*Branta canadensis*), the latter birds making quite a fuss all the time Mr. Green was in the tree. On reaching the nest he was still further surprised to find two Osprey eggs and three of the Canada Goose. He took the two Osprey's eggs and two of the Geese eggs.

This was on the first of May. On the 12th of May he returned and found the Osprey setting on the Goose egg; the geese were nowhere in sight. Mr. Green took the remaining egg and sent the lot to the Museum.

I am aware that it is not unusual for the Canada Goose to nest in trees but for two birds with such strangely opposite habits as the ones above quoted to enter into partnership in the matter of rearing a family is in my experience somewhat strange.

I may mention in this connection that in the Okanagan District, especially along the valleys of the Kettle and Similkameen Rivers, Canada Geese are particularly noted for nesting in trees, and as these valleys are subject to sudden inundation during early spring, this fact may have something to do with it.—JOHN FANNIN, *Provincial Museum, Victoria, B. C.*

The Food of Wild Ducks.— In December, 1893, Mr. William Dutcher brought to me the stomach contents of a Harlequin Duck (*Histrionicus histrionicus*) shot at Montauk Point, Long Island, about the 3rd of the month. An examination of the material showed what an industrious collector the bird must have been, for it had in its crop remains of no less than three individuals of the small mud crab of our coast, *Panopeus depressa* Smith, one carapace being almost entire; besides remains of some other forms of Crustaceans. Of the little shell *Columbella lunata* (*Astyris lunata* of the Fish Com. Reports), there were no less than 39 individuals represented, besides several small Littorinas. This shell is seldom more than one-sixth of an inch long, and is usually quite rare on our shores. It could only have been obtained in such numbers by a sort of sifting of the bottom mud of the bays by the Duck, and indicates how carefully the process had been carried on in order to obtain so small an article of food.

The contents of the crop of an Eider Duck (*Somateria dresseri*) taken by Mr. Dutcher at Montauk Point, L. I., on March 25, 1894, contained the remains of five right claws of *Cancer irroratus*, our common sand crab, showing that he had dined sumptuously on this species on several occasions. The last dinner consisted of an individual entire, a small female burdened with a large quantity of eggs under the flipper, making an object nearly two inches by one and three-eighths, and almost an inch thick, which he must have taken into his crop at a single gulp, without even disturbing a limb.

From the stomach of a King Eider (*Somateria spectabilis*) the contents of which Mr. Dutcher sent, I find the objects so thoroughly comminuted that but little can be identified. The hand and figure of *Cancer irroratus*, young shells of *Mytilus edulis*, and a young shell of *Lunatia heros* Say, which still retains the horny operculum, is all that can be recognized.

Two gizzards of wild Ducks, the contents very much comminuted, furnish, one of them, the almost entire carapace of *Carcinus amœnus* Linn. sp. (= *Cancer granulatus* Say,) measuring about three-fourths of an inch in diameter, the limbs all removed and the whole badly macerated. There were also fragments of *Cancer irroratus*, our common sand crab, and quite a quantity of young mussels (*Mytilus edulis*) none of which measured more than one-half an inch in length. A second gizzard gave evidence of three or four specimens of the small mud crab, *Panopeus depressus*, with many fragments of mussle shells, but nothing else which could be determined.

There is nothing among these remains which would indicate that the birds had been feeding at different localities within a few days of the time they were shot. On the contrary all the contents of their crops and gizzards would show that their food had been for some days obtained in or near our own waters, or at least within the limits of our own coastal fauna, and that crustaceans form a very large percentage of their food during the spring months of the year.— R. P. WHITFIELD, *American Museum of Natural History, New York City.*

The Scarlet Ibis (*Guara rubra*) in Colorado.—My friend Mr. Livesey informs me that whilst he and a party of friends were duck shooting on Grape Creek in Wet Mountain Valley, Custer County, Colorado, in the month of May, 1876, one of the party shot an exceedingly fine specimen of this rare visitor. This bird was skinned and afterwards mounted by a well known firm of taxidermists. So far as I am aware, this specimen, which is now in Mr. Livesey's possession, was never recorded, and hence my reason for making mention of it.—WILLOUGHBY P. LOWE, *Pueblo, Col.*

The Sandhill Crane (*Grus mexicana*).—**A Correction.**—In 'The Auk,' Vol. VIII, pp. 308, 309, I mentioned the capture of this bird, but I expressed my doubts in the article as to its positive identification. It proves to be the Little Brown Crane (*Grus canadensis*) by careful measurements and comparison with a specimen of *Grus mexicana* from Florida. I can find but one other record of this bird for the Atlantic coast, viz.: Brewster, Auk, Vol. VII, p. 89.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Northern Phalarope.—**A Correction.**—In my article 'Notes on Certain Water Birds in Massachusetts' (Auk, XI, July, 1894), at end of third line from bottom of page 226, read *Northern*, for Red. In last word of article, page 228, read *April*, for May.—GEO. H. MACKAY, *Nantucket, Mass.*

***Colinus virginianus cubanensis* not a Florida Bird.**—Being responsible for the introduction of the Cuban Bob-white into the North American list, I desire to state that its introduction was an error, explainable as follows:—

The only Cuban examples of the genus in the National Museum collection, although not agreeing very well with the original description and colored plate of *Ortyx cubanensis* Gould, were naturally supposed to be that subspecies. Birds from southwestern Florida proving to be more like these than examples from more northern localities in Florida (including those from Miami, on which *Ortyx virginianus* var. *floridanus* Coues was based), in fact practically indistinguishable from them, it seemed necessary to refer them to the Cuban form. Mr. Chapman has since shown, however (Bull. Am. Mus. Nat. Hist., IV, 1893, No. 1, p. 290), that two very distinct forms occur in Cuba, the true *Ortyx cubanensis* Gould, which is apparently confined to the mountains, and a form which is "typical of the very dark Quail from southern Florida," which latter he is inclined to think may have been introduced into Cuba. Mr. Chapman having kindly allowed me to inspect his Cuban specimens I am able to state that the specimens from southern Florida referred by me to *cubanensis* are not that bird, but, unless distinguished by a new name, must be referred to *floridanus*.—ROBERT RIDGWAY, *U. S. National Museum, Washington, D. C.*

Baird's Sandpiper near Washington, D. C.—On Sept. 3, 1894, while collecting Sandpipers and other birds on the floating confervæ on the flats in the Potomac River, off the mouth of Four Mile Run, Alexandria County, Virginia, I took a fine immature male specimen of *Tringa bairdii*. This specimen has been identified by Mr. Ridgway and is the first recorded instance from the Virginias and the District of Columbia. It was alone at the time, though hundreds of individuals of *Ereunetes pusillus*, *Tringa maculata* and *Totanus flavipes* were flying about or feeding on the surface of the confervæ.—R. S. MATTHEWS, *Washington, D. C.*

The Ruff and Western Sandpiper near Washington, D. C.—With other Waders on the confervæ off the mouth of Four Mile Run, Alexandria County, Virginia, I collected on September 3, 1894, an immature female *pavonella pugnax*. The condition of the specimen would warrant the belief that it was bred on this continent.

I also took on September 8, at the same place, an immature male *Ereunetes occidentalis*, which is the first record from this locality. In contrast with the excessive fatness of many specimens of the Least and other Sandpipers taken lately at the same place, both the above, especially the Sandpiper, were quite lean. A second specimen, an immature female, was taken on Sept. 11, at the same place, by Mr. R. S. Matthews. These specimens were seen and identified by Mr. R. Ridgway.—WILLIAM PALMER, *Washington, D. C.*

An Asiatic Cuckoo on the Pribylof Islands, Alaska.—An adult male Cuckoo (No. 118864 U. S. N. M. Coll.) that I collected among the sand dunes of Northeast Point, St. Paul's Island, on July 4, 1890, has been identified by Dr. L. Stejneger as *Cuculus canorus telephonus* (Heine). This bird, whose summer habitat is Japan and Kamtschatka, has several times been taken on Bering Island. When collected it was busily engaged capturing some large flies, which are abundant on these islands, and with which its stomach was literally packed. It had been seen by the natives in the same place for more than two weeks, and was probably the same individual seen by myself on June 13, when becalmed in a fog off the eastern side of the same island, on which occasion it circled overhead like a Gull for some time while calmly inspecting the boat, and then moved off northwards.—WILLIAM PALMER, *Washington, D. C.*

The Capture of *Basilinna leucotis* in Southern Arizona.—While collecting in the high Chiricahua Mountains, in southern Arizona during the past summer, the writer had the pleasure of securing a specimen of *Basilinna leucotis*, a new bird to the United States.

During the early part of June a camp was made at Fly Park, a well wooded area southeast of the head of Pinery Cañon, at an altitude of about 10,000 feet. A boreal honeysuckle (*Lonicera involucrata*) grows

commonly through the scattered woods of spruce (*Picea engelmanni*), fir (*Pseudotsuga taxifolia*), pine (*Pinus ayacahuite*) and aspen (*Populus tremuloides*). The flowers of the honeysuckle attract great numbers of hummers, and hundreds of *Selasphorus platycercus*, and many *Eugenes fulgens* and *Caligena clemenciæ* were seen daily about the clumps. Early on the morning of June 9, in company with Mr. Fred. Hall Fowler, the writer saw a female *Basilinna leucotis* sitting on a dead twig of a *Lonicera* bush close to the ground, warming itself in the rays of the rising sun. The white stripe on the side of the head was plainly visible, and led to its speedy capture. Subsequently others were looked for but none were seen.—A. K. FISHER, *Washington, D. C.*

Breeding of the Prairie Horned Lark (*Otocoris alpestris praticola*) near Pittsfield, Mass.—Sometime since I received a letter from Mr. Henry R. Buck, of Weathersfield, Conn., giving a detailed account of the discovery of a small colony of Prairie Horned Larks, evidently breeding, near Pittsfield, Mass. Although the old birds were not taken, they were carefully observed, and Mr. Buck's intelligent description of them, and of the nest and eggs he obtained leaves their identification scarcely open to question, as is shown by the following extracts from his letter. Mr. Buck writes: "This summer [1892] I became interested in a nest . . . of *Otocoris alpestris*, which I thought was only a winter visitor here. Mr. C. H. Buckingham of Pittsfield, Mass., with whom I was walking, found the nest July 10, 1892. . . . The bird had built her nest in a sheep pasture, on the very top of a treeless mountain west of Pittsfield; on the ground of course. She could hardly have found a more unprotected spot, and had not roofed over the nest at all. It was about four inches in diameter, sunk even with the surface of the ground, and was composed of a thick wall of moss lined with dry grass, several locks of wool, and two or three leaves.

"The eggs were four in number, *fresh*, of about the same shape as an English Sparrow's, of a pale greenish ground color, spotted indistinctly but thickly with light brown and purplish. The spots are not at all clearly defined and not perceptibly thicker at one end than at the other. The eggs measure .62 × .84, .61 × .85 and .61 × .83 inches. No. 4 got cracked, so I did not measure it, but it was about the size of the others.

"We could not get a very close look at the bird, since she would sneak off when we were yet quite a distance from the nest, and after she had gone about forty yards would run unconcernedly about, among some rocks near there, but would always keep about the same distance away from us. If we followed her closely she would fly off with a steady, rapid motion of the wings, very like the flight of a Meadowlark. On the ground she ran easily and seemed to be able to go quite fast.

"We saw five or six other birds of the same kind near the place but could find no other nest. The birds were a little longer than a Bluebird—I should say about seven inches—but much plumper and stouter, reminding one of a Meadowlark in this respect. They were brown above and white

below, with the sides of the head below the bill, and also the throat, white, and a narrow black spot, shaped somewhat like a sickle, across the breast. I did not notice any black streaks on the sides of the head or the horns, but as I did not get very close, and did not look for them especially, it is not strange.

"On a second trip to the place, a week later, there was a very high wind blowing and we saw nothing of the birds."

This form of the Horned Lark has been already recorded as breeding in North Adams and Williamstown, Mass. (Faxon, *Auk*, IX, 1892, p. 201), as well as in Vermont, New Hampshire, and near Troy in eastern New York.—WILLIAM BREWSTER, *Cambridge, Mass.*

Capture of Clarke's Nutcracker in Crittenden County, Arkansas.—A specimen of Clarke's Nutcracker (*Picicorvus columbianus*) was killed at Earl, Crittenden County, Ark.; about twenty miles west of Memphis, Tenn., about April 1, 1891, and sent to Memphis for identification. It came into my possession in the flesh, but was already somewhat decayed about the head. I partly mounted it, and putting it aside for the time it was almost forgotten. Some time afterward I had it remounted by a professional taxidermist, but on account of the poor condition of the skin he could not make a very nice specimen of it.—ROBERT H. MITCHELL, *Memphis, Tenn.*

Occurrence of *Aphelocoma cyanotis* in Western Texas.—In the U. S. Department of Agriculture collection there are three specimens of *Aphelocoma* in worn plumage, collected by William Lloyd in western Texas. Through the kindness of Mr. Robert Ridgway they were compared with the type of *Aphelocoma cyanotis* in the National Museum collection, and were found to be referable to that species. They differ from *cyanotis* in averaging a little smaller and in having a more slender bill, thus grading toward *woodhousei*, as might be expected, where the range of that bird is approached. In coloration, however, allowing for the slight difference due to the wearing of the plumage, they are identical with *cyanotis*, and in no way resemble *woodhousei*. The specimens were taken July 14, 18 and 21, 1890, at Paisano, the highest point (5082 feet) on the Southern Pacific Railroad in Texas, about 60 miles north of the Mexican boundary.—A. K. FISHER, *Washington, D. C.*

Icterus parisorum in Western San Diego County, California.—The first week in April of the present year I was encamped on the Tia Juana River about two miles south of the National boundary and eight miles from the coast. Scott's Oriole was not uncommon at this point, nor at a later camp about twenty miles from the coast and not far from ten miles south of the boundary. As the country is exactly similar to that north of the line in western San Diego County, it is not unreasonable to expect that the species will be found equally common and of regular occurrence in favorable localities through the southern part of this county. In 'The

Auk' of April, 1891 (Vol. VIII, p. 238), Mr. F. C. Brown records the capture of a specimen by Chas. H. Marsh in Telegraph Cañon, ten miles east of San Diego, and gives it as the first for California. It has been known for some time that the species is of regular and common occurrence through the eastern part of San Diego County as far as the western edge of the Colorado Desert, but the region just north of the boundary and to the west of the mountains has been explored but little heretofore.

Mr. F. Stephens once told me that he felt sure that it was the song of this species that he once heard at Campo, and expressed the belief that the bird would be met with in time nearer the coast.

In January, 1894, I found this Oriole wintering in the foothills just east of San Quintin, Lower California, and feeding extensively, if not altogether on the ripe fruit of the 'pitahaya' cactus (*Cereus gunnosus*). This fruit is about the size and shape of a small orange, bright scarlet when ripe. The flesh is similar to that of a ripe watermelon but much darker with an abundance of very small dark seeds. In flavor it is not unlike raspberries, but rather acid. Unless the fruit is abundant it is almost impossible to find any that has not been torn open and the inside eaten by the birds,—Thrashers, Mockingbirds, Orioles, Sapsuckers and all of the Sparrows joining in the feast. All, except the Sparrows, were frequently badly stained about the head and breast from the purple juice, which also stains the entire alimentary canal.—A. W. ANTHONY, *San Diego, California*.

Taming Chipping Sparrows.—I noticed in the last number of 'The Auk' (Vol. XI, p. 256) a reference to the taming of a Chipping Sparrow (*Spizella socialis*). My father has always had a great fondness for birds and has devoted a great deal of time to ornithology. Some four or five years ago, at my home in Nelson County, Virginia, there were several pairs of Chipping Sparrows building in the rose bushes around the porch along the front of the house. It was the custom of my father upon leaving the breakfast table every morning to put several pieces of bread in his pocket with which he fed the dogs who always were waiting his appearance. He generally threw a few crumbs on the floor of the porch for the Chipping Sparrows and they soon learned to expect his coming. Setting to work in a methodical way he soon had one of the little birds so tame that it would perch on his hand and pick crumbs from his palm, and in a short while it became so familiar as to go to any one of the household in the same way. (I send with this three photographs which show the bird perched on and feeding from the hand of different members of the family.)

In the fall the bird left with the other migrants, but, to our surprise, returned in the spring without any symptoms of shyness, evidently remembering us all. It returned for three successive years, and each time raised two broods of young. Last year it failed to appear, so I suppose has lived out its little life.—WIRT ROBINSON, *1st. Lt. 4th U. S. Art., Washington Barracks, Washington, D. C.*

Note on the Habits of the Northern Shrike (*Lanius borealis*).—On the 9th of March, 1892, at Concord, Mass., I saw a Northern Shrike (*Lanius borealis*) capture, kill and dispose of a meadow mouse. The bird's behavior and methods were so interesting and, in some respects, peculiar that I submit the following account of the episode in nearly the words in which I find it described in my notes written at the time.

As I was watching a Shrike it flew from the topmost spray of a small maple into some alders and alighted on a horizontal stem about a foot above the level of the surrounding snow; but directly beneath, as I afterwards found, the snow had thawed quite down to the ground leaving a trench about two feet deep by three or four inches wide into which the Shrike, after peering intently for a moment, suddenly dropped, with fluttering wings and wide spread tail. Within a second or less it reappeared dragging out a field mouse (*Arvicola riparius*) of the largest size. The moment it got the mouse fairly out on the hard surface of the snow it dropped it, apparently to get a fresh hold (as nearly as I could make out it had held it, up to this time, by about the middle of the back). The mouse, instead of attempting to regain its runway, as I expected it would do, instantly turned on its assailant and with surprising fierceness and agility sprang directly at its head many times in succession, literally driving it backward several feet, although the Shrike faced its attacks with admirable steadiness and coolness, and by a succession of vigorous and well aimed blows prevented the mouse from closing in. At length the mouse seemed to lose heart and turning, tried to escape. This sealed its fate, for at the end of the second leap, it was overtaken by the Shrike who caught it by the back of the neck and began to worry it precisely as a terrier worries a rat, shaking it viciously from side to side, at the same time dragging it about over the snow which, as I could plainly see through my glass (I was standing within ten yards of the spot), was now freely stained with blood. I could also see the Shrike's mandibles work with a vigorous, biting motion, especially when it stopped the shaking to rest for a moment. When it finally let go its hold the mouse was evidently dead. The Shrike now looked up and seeing me jumped on the mouse with both feet and flew off *bearing it in its claws*. Its flight was slow and labored. In fact it did not succeed in rising more than two feet above the snow and went less than two hundred feet before relighting. As I again approached it was tearing at the mouse but it stopped as soon as it saw me and flew some fifty yards further, dropping, this time, into a thicket of alders where it laid the mouse on the snow and resumed its meal. Shortly afterwards it raised the mouse to a branch a few inches above the snow and doubling it over this so that the head hung down on one side, the tail on the other, left it for awhile and alighting above it sat for several minutes nearly motionless. Then it returned to the mouse and taking it by the head dragged it up along the branch until it came to an acute-angled fork a foot or more above the snow. Through this fork it dropped the body;

then, keeping the head above the twigs, it drew the neck firmly into the base of the fork, at the same time stepping backwards and tugging at the head with all its strength, frequently beating its wings vigorously to add to the force of the pull. This task completed to its apparent satisfaction (the entire operation consumed at least three or four minutes), the bird began eating again but in a somewhat listless manner, making long pauses between the mouthfuls. Evidently its appetite was about sated. At length it flew into a neighboring tree where it sat for a long time dressing its feathers—a decidedly necessary attention, for, as I could plainly see through my glass (I now stood within fifteen or twenty feet), its plumage was in sad condition; the feathers of the forehead and throat were matted and soaked with blood, the breast was reddened perceptibly and the bill was almost wholly of a carmine tint. After getting itself into somewhat better trim it flew into some young pines.

I now examined the mouse. The Shrike had not touched any part of the body, but the skin had been torn away from the entire neck, and the muscles and other soft tissues were almost entirely gone from the shoulders and sternum to the base of the skull. The body was untouched and the skull showed no sign of injury, but the cheek muscles had been eaten pretty cleanly away, as had also the entire throat, with the tongue. Both eyes were whole and in their sockets. This examination confirmed the conviction which I formed while watching the Shrike and mouse struggling together, viz., that the bird killed the mouse partly by *throttling*—that is by choking and shaking it—and partly (perhaps chiefly) by cutting its neck open on one side. No attempt was made to stun the mouse by striking at its skull, such blows as I saw delivered being evidently intended to keep the mouse at bay until the Shrike could close with it and get it by the neck.

While I was examining the mouse the Shrike began uttering a mewling cry among the pines. This seemed to be a remonstrance directed at me. I went to the spot and found the bird sitting low down amid dense pine foliage looking rather dumpy and unhappy. About an hour later I returned to the alders and examined the mouse again. As far as I could detect it had not been touched in my absence. I did not see the Shrike again.

The next day at 10 A. M., I visited the alder thicket but the mouse was gone. As there were no tracks in the snow beneath where it had hung I concluded that the Shrike must have returned and removed it.—
WILLIAM BREWSTER, *Cambridge, Mass.*

The Carolina Wren in Winter in Mercer County, Pennsylvania.—On Jan. 1, 1891, I shot a male Carolina Wren (*Thryothorus ludovicianus*) and observed another of the same species. For several weeks previously the ground had been covered with snow, which, however, was rapidly melting at this time. The bird was in full song and appeared not at all

incommoded by the weather. So far as I know, this is the farthest north this species has been found in winter, at least in the Eastern States. Mr. Geo. B. Sennett informs me that he has never seen it or heard of its being seen in Crawford County, just north of Mercer, where he lived for a number of years.

This note was published in the 'Ornithologist and Oologist' several years ago, but through a blunder on my part, the name "Bewick's Wren" was substituted for Carolina Wren.—F. LEROY HOMER, *New Hamburg, Mercer Co., Pa.*

The Yellow-breasted Chat in Maine.—In the autumn of 1893,—she believes it was during the month of September,—Mrs. William Senter, of Portland, found upon her lawn the mangled remains of a small bird. It had apparently been mouthed by a cat. Mrs. Senter cut off its head, legs, wings and tail, and preserved them. A few days ago, the relics were shown me. They were those of a Yellow-breasted Chat (*Icteria virens*) in full autumn plumage. Thus is a bird added to the Maine list.—NATHAN CLIFFORD BROWN, *Portland, Maine.*

Nesting of the Red-bellied Nuthatch in Templeton, Mass.—On the morning of June 10, 1894, while walking through the woods with my nephew on the banks of Otter River in Templeton, and having for an object anything new or interesting, with an especial 'leaning' towards birds' nests, we came to an old stub about fifteen feet high. Following my usual custom in such cases I pounded vigorously to see if any one was "at home." I was surprised to see a Red-bellied Nuthatch (*Sitta canadensis*) fly from the stub and perch on a hemlock limb within six feet of my face and remain there for some minutes, giving me abundant opportunity to positively identify her.

I immediately climbed the stub and found a hole which, had I been as familiar with the breeding habits of the Nuthatch as I have since become, I would have recognized at once as belonging to this species. The lower half of the circumference of the hole was thickly smeared with pitch, which seemed such a strange circumstance that I tore that portion of the wood away whole and passed it carefully down to my nephew and we brought it home. I thought at first that the pitch must have dripped from some wounded limb overhead but there was none there, and the stub was perfectly dry and very much decayed; therefore it must have been brought there by the bird for some purpose doubtless well understood by her, but, so far as I can learn, to no one else.

The hole was about 12 feet from the ground, on the side towards the river (north), and directly over the water where the river widens out into a shallow, weedy lake of perhaps twenty acres in extent. It was about 1½ inches in diameter and 6 inches deep, running down just inside the hard shell of the stub. The nest was simply a handfull of what appears to be fine shreds of inner bark of the dead branch of some tree,

and fine bark from weeds. There was no attempt at weaving, but the depression was apparently shaped by the body of the bird. It was so loosely constructed that I was obliged to carry it home carefully in my hand for fear it would come to pieces. The nest contained three perfectly fresh eggs, agreeing with the description given by various authors of those of this Nuthatch; also *two young birds* apparently two days old and larger than young of the Red-bellied Nuthatch could possibly be at that age. What could the youngsters be? Surely not Nuthatches, and it did not seem possible that a Cowbird could gain access to the nest, even if she were disposed to try. The place and situation of the hole is just where we would expect to find the White-bellied Swallow breeding, and this led me to think that in some way the claims to the hole were somewhat mixed between these two birds.

I immediately wrote to Mr. William Brewster, and at his request sent him one of the young birds, which I had preserved in spirit, for examination. Mr. Brewster writes: "Your youngster is positively not a Cowbird. It differs from my specimen of the latter (two days old) in having a much wider head and gape, a more depressed bill, shorter tibiæ, and in many other essential respects. I have not been able to get at any young Swallows, but your bird looks to me like a young White-bellied Swallow, and I am very sure that is what it will turn out to be."

At Mr. Brewster's suggestion I sent it to Mr. Frederic A. Lucas, who also kindly interested himself in the case, but failing to get a young Swallow for comparison, owing to the lateness of the season when the bird was sent to him, he was unable to positively identify it but expressed himself as very confident that it is a White-bellied Swallow.

It would be interesting to know the exact relations between these two birds. The logical conclusion would seem to be that the Swallow was the first occupant and had succeeded in laying two eggs when she was routed or crowded out by the Nuthatch, who retained possession and unintentionally, perhaps, hatched the eggs of the Swallow while laying her own eggs, and the youngsters, either with or without the aid of their foster-mother, worked their way up through the loose material of the nest. Yet one is left to wonder which parent fed them, or if they were fed at all.—CHARLES E. INGALLS, *East Templeton, Mass.*

Notes from Raleigh, N. C.—*Ammodramus lecontei*. One female taken at Raleigh by me, April 21, 1894, on the edge of a wet meadow. This is the first record for Raleigh, and we believe also for North Carolina.

Ammodramus henslowi. One male taken by me April 21, 1894, within a few yards of where I killed the Leconte's Sparrow; and another April 27, also a male, on the edge of a small stream. These are the second and third records for Raleigh.

Habia ludoviciana. One male taken by me May 4, 1894, at Raleigh.

Empidonax pusillus trailli. One taken Sept. 21, 1893, a male, the third record for Raleigh.

Cistothorus stellaris. A male taken by me Sept. 20, 1893, our second record for Raleigh.

Quiscalus æneus. Two, a male and female, taken Nov. 14, 1893, our second record for Raleigh.

Asio wilsonianus. A male taken Dec. 11, 1893, our second record for Raleigh.

Charitonetta albeola. A female taken Dec. 6, 1893, our first satisfactory record for Raleigh.

Nycticorax violaceus. An immature female taken June 25, 1894, and an immature male July 14, both close to a small stream. These are our first Raleigh records.

Clivicola riparia. A female taken Aug. 8, 1894, our second record for Raleigh.—C. S. BRIMLEY, *Raleigh, N. C.*

Four Additions to the Birds of the Virginias.—Specimens of four species of birds not included in Rives's List are in existence, two of which were taken in Alexandria County, Virginia. Three of the ten specimens are in the National Museum Collection, one in that of my friend, Mr. E. J. Brown, and the others in my own.

Acanthis linaria. REDPOLL.—One specimen, taken by Dr. T. H. Bean at Ft. Runyon, Feb. 19, 1875 (N. M. Coll. No. 68645).

Ammodramus caudacutus nelsoni. NELSON'S SPARROW.—One taken by C. Drexler in September, 1862 (N. M. Coll. No. 25905); another taken by E. J. Brown on Cobb's Island, May 11, 1892 (E. J. B. Coll. No. 228); and a third taken by myself on Four Mile Run Marsh, Sept. 18, 1893 (W. P. Coll. No. 3266).

Dendroica palmarum palmarum. PALM WARBLER.—Probably a regular though rare migrant. I know of five specimens as follows: April 22, 1885, Roslyn (W. P. Coll. No. 1323); Sept. 18, 1887, Potomac Landing (W. P. Coll. No. 1600); April 29, 1888, Roslyn, collected by C. W. Richmond (N. M. Coll. No. 123549); Oct. 4, 1891, Ballston (W. P. Coll. 2833). This specimen has but one leg. Sept. 22, 1893, Four Mile Run, collected by E. J. Brown (W. P. Coll. No. 3281). These in connection with the following specimens, taken in Maryland near Washington, would indicate that the birds occur regularly: May 11, 1881, Soldiers' Home, D. C., collected by L. M. McCormick (N. M. Coll. No. 82477); May 6 and 11, 1889, Laurel, Maryland, collected by R. Ridgway (W. P. Coll. Nos. 2251, 2252); May 11, 1890, Riverside, Maryland, collected by C. W. Richmond (N. M. Coll. No. 123548).

Helminthophaga bachmani. BACHMAN'S WARBLER.—Examining recently the collection of Master P. Henry Aylett, of King William County, Virginia, I found a specimen of this bird. Unfortunately the collector failed to determine the sex and exact date. The specimen is undoubtedly a young male of the year and was collected near Aylett's as above, in August, 1892. This specimen agrees in most particulars with other males of this species, except that the black on the crown is more

restricted, and only visible on parting the feathers; the plumage is also much brighter and fresher than in ten spring males with which it has been compared.

Back dark olive green, upper part of head and neck slate-gray, with a greenish tinge changing to olive-green on the sides of neck and ear-coverts. Forehead, lores and chin lemon-yellow, connected with similar color around eyes and extending along sides of throat to the shoulders. Yellow of forehead obscured by greenish, the lores by black. Throat and forepart of breast dull black. All black feathers tipped with pale greenish yellow, those on the throat being marked as follows. Bases dusky-black, centers pale yellowish, then a band of darker dusky-black tipped with yellowish. Wings and tail as in adults but fresher. Breast lemon-yellow extending down the center nearly to the under tail-coverts, which are yellow at the base, the longer feathers as well as the abdomen being white; sides of breast greenish. Shoulders yellow as in adults, the middle wing-coverts edged with yellowish with dark centers. Three outer tail-feathers with white blotches on inner webs, the fourth showing some white on the edge and the fifth but a trace. Bill black above and near tip of lower mandible, the rest horny; feet dark. As the specimen was moulting the feathers about the throat are scanty and the markings not well defined. The first three primaries are but half grown, they evidently being the last developed of the second flight feathers. When I first saw this specimen a single feather of the nestling plumage remained among the feathers of the head, and I have since found several others on the sides of the neck near the shoulders. They were very pale slate-gray, the one on the head having the margin well worn.—WILLIAM PALMER, *Washington, D. C.*

Irregular Abundance of Birds in the Breeding Season in Different Years at the Same Locality.—Several times of late my attention has been drawn quite forcibly to the fact that birds, or at least some species, are not entirely constant in their choice of a summer home, but vary the location of their breeding places to some extent from year to year. For this reason it does not seem safe to draw conclusions as to the abundance or rarity of a given species at a given place, from the experience of a single summer. As evidence of this, I may note the following discrepancies between my own observations and those of others. But for the fact that the terms 'abundant,' 'common,' 'quite common,' etc., are comparative and may not mean precisely the same to two persons, many more instances of this kind could, perhaps, be noted. In the following cases, however, it seems as if the only possible explanation was irregularity on the part of the birds themselves.

In the 'Atlantic Monthly' for August, 1894, Mr. Frank Bolles writes of the Red-eyed Vireo (*Vireo olivaceus*) in Cape Breton, as "not as numerous as in New Hampshire, but there were enough of them to keep up a running fire of conversation from one end of the island to the other."

This was in the first two weeks of August, 1893. In Dr. Jonathan Dwight, Jr.'s, interesting paper on 'Summer Birds of the Bras d'Or Region of Cape Breton' (Auk, Vol. IV, p. 13) this species is included in the list, but nothing is said as to its abundance. Dr. Dwight's observations were made in the first half of August, 1886. Now my own experience was very different, for in the nine days from June 4 to 12, 1890, spent in Baddeck and vicinity, including excursions to St. Anne's Bay and Northeast Margaree, I found, as stated in 'The Auk' (Vol. VIII, p. 164), *not a single Red-eyed Vireo*.

Dr. Arthur P. Chadbourne spent the summer of 1887 in Waterville, N. H., and I was there during the last two weeks of June, this year. Dr. Chadbourne has kindly given me a copy of his field list, and on comparing it with mine, I find quite a number of differences. Perhaps the most remarkable are these. In 1887 Dr. Chadbourne found about half a dozen *Colaptes auratus* there. This year I found none, and so familiar and noisy a bird could hardly have escaped my notice, had it been present. On the other hand I found *Ammodramus sandwichensis savanna* tolerably common, *Clivicola riparia* (one sizable colony), and several *Turdus fuscescens*, which I heard singing whenever I walked down the road about sunset; but apparently none of these three species were present in 1887. Moreover, Dr. Chadbourne did not observe *Dendroica maculosa* there until after the middle of July, and those that he then found he took to be migrants, while seven years later I find them common birds in the Waterville Valley and, as it seemed to me, the commonest of the Warblers there. *Vireo olivaceus* was represented in 1887 by only a single pair while in 1894 they were actually *abundant*. The woods were full of them. Dr. Chadbourne found *Dendroica coronata* common on mountain summits, but did not see them on the slopes or in the valley until July 30, whereas I found them in the latter part of June quite common all through this region, though commonest at the higher elevations. *Zonotrichia albicollis* also was apparently present in much greater force this year than in 1887.

The causes of these irregularities are probably many and various, but the facts themselves struck me as interesting and perhaps too readily lost sight of in making generalizations.—FRANCIS H. ALLEN, *West Roxbury, Mass.*

CORRESPONDENCE.

Parasites of Birds.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs:—An interesting note by Dr. R. W. Shufeldt in the April number of 'The Auk' suggests that other ornithologists might be interested in knowing where to find descriptions and figures of the parasites which occur upon birds. For the group of Mallophaga, which is the principal group of insects infesting birds, there is a very extensive and exhaustive monograph in French by Piaget entitled 'Les Pediculines,' which, with supplement, covers practically everything that is known regarding systematic arrangement and descriptions of these parasites as well as of the suctorial parasites of mammals up to date of publication of the supplement, about seven years ago. A few papers by the same author and by Neumann have appeared since then and the writer has given a short account of the species affecting domestic animals, also describing some American species, in Bulletin Number 7, of the Division of Entomology, United States Department of Agriculture.

Of the earlier works on these parasites those of Nitzsch and Denny are important, the latter being in English and covering the species known to occur in Great Britain. This was published in 1842 and is, of course, deficient in regard to the recently described species. Another work, the 'Epizoa,' by Geibel, in German, contains full accounts of the species known up to 1872, with colored plates for a large proportion of them, and is quite serviceable for the study of these parasites. The work by Piaget, however, is most essential.

In regard to photographing these insects it has been my experience that it is a difficult matter to get photographs which give distinct details of the minute parts, some of which are particularly necessary for the discrimination of the species, although the photographs will give a general outline and certain portions very distinctly. If the photograph is made with transmitted light certain portions, especially where the tissues are denser, will appear obscure, and most surface characters are lacking, and with reflected light it is impossible to get photographs from specimens in balsam, and if taken from unmounted specimens there is much difficulty in getting the parts all into focus so as to secure a distinct outline as well as clear details of the surface markings. These parasites can be studied very nicely with a compound microscope with powers ranging from 50 diameters to 200 diameters, and if the specimens can be examined while alive some of the structures otherwise obscure are likely to be discovered. In preserving them it is well to put a number in alcohol in small vials with note giving name of host, and if the material

is abundant, to preserve some at once by mounting in Canada balsam upon glass slides for microscopic study. Suggestions in this line have been made in a recent article in the 'American Monthly Microscopical Journal.'

Very respectfully,

HERBERT OSBORN.

Agricultural College, Ames, Iowa.

Notes on the Steganopodes, and on Fossil Birds' Eggs.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs:—Through the courtesy of the United States National Museum I have been permitted to examine their entire series of skeletons representing all the North American representatives of the Steganopodes. This material I have also compared with osteological preparations of steganopodous birds in my own collection, and with those from other parts of the world. My comparative studies of this remarkably fine series convinces me that this group, in so far as their skeletology seems to indicate, may be arrayed as a fairly natural SUBORDER of birds, for which the name STEGANOPODES may be retained. Upon again dividing them they would appear to fall into at least three superfamilies, and an entire taxonomical scheme, to include so far as the genera only, would stand as follows:—

SUBORDER.	SUPERFAMILIES.	FAMILIES.	GENERA.	
STEGANOPODES	{	Pelecanoidea	{ Pelecanidæ. Phalacrocoracidæ. Anhingidæ. Sulidæ.	<i>Pelecanus.</i> <i>Phalacrocorax.</i> <i>Anhinga.</i> <i>Sula.</i>
		Phaëthontoidea	Phaëthontidæ.	<i>Phaëthon.</i>
		Fregatoidea.	Fregatidæ.	<i>Fregata.</i>

In the 'Proceedings' of the Zoölogical Society of London for this year (1894, p. 160) I published a brief article 'On the Affinities of the Steganopodes,' wherein there was set forth a classificatory scheme for this group, but unfortunately it contained an error that made it appear that the genera *Pelecanus*, *Phalacrocorax*, *Anhinga*, and *Sula* all belonged to the family *Pelecanidæ*, which of course is a proposition that would not be entertained for a moment by any thinking avian taxonomer. There are no better defined families anywhere in ornithology than the Pelicans, the Comorants, the Anhingas, and the Gannets. Of the Pelecanoidea, the two most closely related families are the Phalacrocoracidæ and the Anhingidæ, while the next most evident fact is the less close affinity existing between the Comorants and the Sulidæ. *Pelecanus* is an aberrant genus having varying relations with all the other three remaining families of the Pelecanoidea. From this last-named superfamily we are led to the Phaëthontoidea through the Sulidæ, and especially through

the great similarity of a number of the skeletal characters as seen in *Sula brewsteri* as compared with the corresponding ones of the genus *Phaëthon*.

Again, in some osteological particulars *Phaëthon* links the Steganopodes with the Longipennes on the one hand, and with the Tubinares on the other. There are many suggestive "gull characters" in the skeleton of *Phaëthon flavirostris*, and even more that suggest to us the skeleton as seen in *Puffinus*.

Of the three superfamilies given in my scheme above, the most unique and best defined one is the Fregatoidea. The pelvis in *Fregata* is more like the pelvis in *Phaëthon* than it is like that bone in any of the other steganopodous types, but the strangest fact is the very close resemblance, both superficial and real, its skull has to the skull of a typical Albatross,—as for example that of *Diomedea albatrus*. In my P. Z. S. article I pointed out a number of these characters, but in another account not as yet published, I have written out a very full comparative description of the skeleton of *Fregata* which will appear in due course.

Passing now to another matter I would invite your attention to another paper recently published by the present writer, and I refer to my 'Comparative Oölogy of North American Birds' which appeared in the Report of the U. S. National Museum for 1892. On page 461 of that memoir I remark that I am "not aware of the discovery of the eggs of any of the now extinct forms of reptiles, either fossil or subfossil, and it is beyond all probability that we will ever know what the eggs of *Archæopteryx*, or any of the toothed birds of the Kansas Cretaceous Beds (*Hesperornis*, *Ichthyornis*, and others), or, indeed, any of the smaller extinct types of Aves, looked like." This opinion I believe to be quite general, or at least it is by no means a well-known fact that specimens of fossil eggs of both reptiles and birds have been found and now exist in certain collections. I was among the number standing in ignorance of that fact when I published my above-named memoir, but since then, through the kindness of Mr. F. A. Lucas of the U. S. National Museum, I have been shown in the palæontological collections of that institution, very perfect specimens of thoroughly fossilized eggs of a small turtle, probably an *Emys*, also fairly good specimens of fossilized birds' eggs (*Larus*, or of some allied type?).

All these specimens are from the Paris Basin, and were received from the distinguished French savant, M. Alphonse Milne-Edwards. The birds' eggs, which interest us here, consist of a subfossilized, more or less broken shell, of a dull gray color, which closely overlays the solid fossil infiltrated matter that fills up in each case the egg cavity. Those I examined show no evidence of markings of any kind on the surface of the shell, which is no more than what we would expect. With such specimens as these before me, I can now easily believe that it lays quite within the range of possibility for us some day to find in the Kansas Cretaceous Beds fossilized eggs of the extinct toothed birds above named.

Indeed, that cretaceous formation, it would seem to me, would afford the very best conditions for the preservation of such objects.

Captain Bendire has shown me a very beautiful specimen of a fossil egg of a turtle (*Emys*) that he personally collected. It is from the Cretaceous, and the fossilized remains of the turtle were found with it. He also showed me a fine fossil bird's egg, probably a *Sula*, found 42 ft. below the surface of a guano deposit on the Island of Lobos de Tierra, coast of Peru, and which has been estimated by the Peruvian scientists to be a thousand years old.

I reiterate my belief here that it is very likely that the eggs of all the early ancestral types of birds were plain white and without markings of any kind. When I say this I do not mean to include of course the more immediate ancestral types of modern birds, though it is probable that many of them laid pure white eggs, but rather those avian or reptilo-avian forms belonging to still earlier geologic periods, as for example such a horizon as the one in which *Hesperornis* and its contemporaries are found, or perhaps even still a little later, as those of the early part of the Tertiary age.

Very respectfully,

R. W. SHUFELDT.

Takoma, D. C.,
25 July, 1894.

NOTES AND NEWS.

THE TWELFTH CONGRESS of the American Ornithologists' Union will be held at the American Museum of Natural History in New York City, beginning Monday, Nov. 12, 1894, with the meeting of the Council and the business meeting for the election of officers and members and the transaction of the usual routine business. Tuesday and following days will be given to public sessions for the reading and discussion of scientific papers. Members intending to present papers are requested to forward the titles of their papers to the Secretary, Mr. John H. Sage, Portland, Conn., prior to Nov. 7, in order to facilitate the preparation of the program of papers to be read before the Congress.

MR. SAMUEL N. RHOADS of Haddonfield, New Jersey, has just published his 'Reprint of the North American Zoölogy, by George Ord,' announced some months since (see *Auk*, XI, p. 190) as in preparation. It forms an octavo volume of nearly 200 pages, relating about equally to mammals and birds. The work comes too late for formal review in the present number of 'The Auk.'

MR. GEORGE K. CHERRIE, for the last six years connected with the Museo Nacional at San José, Costa Rica, has recently resigned from the service of the Costa Rican government and returned to the United States. Almost immediately upon his arrival in New York he was offered and accepted the position of assistant in the Department of Ornithology at the Field Columbian Museum in Chicago, of which Mr. C. B. Cory has recently been made Curator (see *Auk*, XI, p. 264).

Mr. Cherrie has made an enviable record for himself in Costa Rica, displaying an energy and a capacity for work rarely equalled. He entered the employ of the Costa Rica government as its taxidermist. Soon, however, the authorities of the Museum, recognizing his industry and abilities, placed him in sole charge of the department of zoölogy. His interest in ornithology led him into the field as a collector and explorer, with the result of bringing together a collection of some 12,000 bird skins, besides many nests and eggs and several hundred specimens of mammals. His explorations covered nearly the whole of the Costa Rican Republic, but the region immediately about San José, the Volcano of Irazú, and the southwest coast region were the areas receiving special attention. These explorations added between fifty and sixty species to the list of Costa Rican birds, about twenty of which were new to science. He has published some of the results of his ornithological work in various preliminary papers (see *Auk*, Vols. VII-X, and *Proc. U. S. Nat. Mus.*, Vols. XIV-XVI), and various new species of mammals have been described from his material. Recent political changes in the country rendered the further prosecution of his work temporarily impracticable, but he has by no means given up hope of again resuming it at some more favorable time, and of publishing in detail the important facts he has gathered regarding the geographical distribution of the birds of Costa Rica, and the several well-marked life-areas into which the Republic is separable.

DR. EDGAR A. MEARN'S, U. S. A., was detailed nearly three years since to accompany, as surgeon and naturalist, the International Boundary Commission appointed to relocate and mark the boundary line between Mexico and the United States. The Commission started from El Paso, Texas, in March, 1892, and reached the Pacific Coast early in July, 1894. Dr. Mearns has thus had somewhat over two years in the field, traversing a line nearly one thousand miles in extent, across portions of country so arid that it was necessary to transport water for long distances for the use of the expedition. Opportunity was thus afforded for collecting at points ordinarily inaccessible to naturalists, and from which specimens will not often be obtainable in the future. With the aid of one regular assistant and more or less casual help from other sources, Dr. Mearns has brought together immense collections in various departments of natural history, but particularly in mammalogy, ornithology, ethnology and botany. It is therefore very gratifying to learn that he has been assigned to duty at Fort Myers, in the immediate vicinity of Washington, and hence within easy access to the libraries and collections of the U. S. National Museum

and Smithsonian Institution. This will give him all needed facilities for working up his large collections, which will doubtless be made the basis of elaborate reports upon the natural history of the region traversed by the Boundary Commission.

ON JULY 7, 1894, the steamship 'Miranda' sailed from New York for Greenland, having on board a large party of scientists and pleasure seekers, under the leadership of Dr. F. A. Cook, surgeon and ethnologist of the first Peary Expedition. It was the intention to visit Newfoundland and the Labrador coast and then proceed, if possible, as far northward as the Peary headquarters at McCormick Bay.

But a series of mishaps befel the vessel, ending in her loss by striking a rock off West Greenland. The excursionists, as well as the ship's crew, were safely transferred to the fishing schooner 'Rigel,' and after many discomforts safely reached New York. But everything in the way of outfit and supplies, together with large collections in various departments of natural history, and about 1000 photographs, went down with the ill-fated steamer. Among the naturalists of the party were L. L. Dyche, Professor of Zoölogy in the University of Kansas; E. A. McIlhenny of Louisiana, and H. Travis of the American Museum of Natural History. Special attention had been given by them to birds and mammals, their combined collections numbering nearly 1000 specimens, forming one of the most important single collections ever made in Greenland. A special feature of the collection was a large series of the young, in various stages of growth, of the various species of both land and water birds met with. Had the expedition not been thus brought to an untimely close, the results would have been of great importance for ornithology. Although the naturalists of the party saved their note-books, the loss of the specimens is greatly to be deplored.

IT GIVES us pleasure to announce that Mr. D. G. Elliot, the well-known ornithologist and mammalogist, has been added to the scientific staff of the Field Columbian Museum of Chicago, he having recently been appointed Director of the Department of Zoölogy, and will soon enter upon the duties of his office.

Mr. C. A. BABCOCK, Superintendent of Schools at Oil City, Penn., "has recently established a 'Bird Day' in the schools under his supervision. The literary exercises of the occasion are similar to those that have characterized the observance of 'Arbor Day' for the last decade, the object being the preservation of American birds from the women who wear them and from the small boy." From Mr. Babcock himself we learn that the pupils of his schools study birds throughout the year, making original observations which become the subjects of compositions or of 'talks' in the schools. Bird Day is merely the occasion for gathering together the work of the year, with the addition of such statements from books as can be made in the allotted time. "The peculiarity of our Nature Study," he adds, "is that it consists of actual observation by the

pupil, and not in learning from books." Well would it be if the example here set could be followed generally by the schools throughout the country. Aside from the advantage to the pupil of the knowledge gained, no better bird protection could be devised.

THE fashion journals just at the present time are not altogether pleasant reading to bird lovers or to persons of refined or humane instincts; for it is too evident that the absurd craze for hat decorations composed of bird skins; either entire or in endless degrees of mutilation and disfigurement, is again rampant. Thus a no less respectable fashion journal than 'Harper's Bazar,' in its issue of Aug. 18 last, in an article devoted to 'New Hats and Bonnets,' gives the following delectable information to its readers, without a word of protest or lament, under the subheading 'Birds and Wings.' ". . . Blackbirds prevail, and are poised in pairs, with beaks meeting lovingly, their wings and tails pointing straight to give the shape of a large bow, and often resting on a still larger bow of Liberty satin ribbon of many loops. This happy arrangement is on the front of small bonnets, while large hats have a second pair [of birds] across the back, resting on loops or *choux* of ribbon below the upturned brim. Single birds perch on the front edge of the brim of round hats, or nestle in the large ruche that surrounds the crown—the nestling or brooding bird is not considered so effective as the newly lighted bird with wings still in the air. The dear little blackbirds have been touched with color by French milliners, who hesitate at nothing. They are given throat or breast of bluet blue, aubergine, or emerald green, and their raven wings are also covered on one side with these colors. Small bluebirds and others of pale yellow or pink are *givr * with jet along their slender wings and pointed beaks. Large *choux* made of feathers or stiff quills *poudr * with jet are effective trimmings!"

Other fashion journals not only give similar instructions to their patrons, but illustrate these wonderful effects with appropriate figures.

On the other hand, it is refreshing to find evidence in 'The Fashions' column of some of our metropolitan newspapers that not all women are devoid of sense and feeling in millinery matters. Thus in the New York 'Evening Post' of recent date we find the following: "The fact is to be regretfully recorded that there is to be a rage for bird garnitures in millinery. Birds in groups or singly, and often their heads, wings, and breasts separately, form a decided feature of the season's very gay millinery. . . . Blackbirds, canaries, seagulls, swallows, and birds grotesquely dyed in various brilliant hues are seen on bonnets which look smaller than the decoration, so large are some of the victims to the brutal and perverted taste."

Evidently there is still hard work ahead for the A. O. U. Committee on Bird Protection, for the Audubon Societies, and for the Prevention of Cruelty to Animals Societies, to meet this renewed attack upon bird life in the interest of the milliners' demand for 'bird garniture.' But more still can be done by the sensible women of the country individually, by not only refusing to wear such badges of barbarism, but by decrying the fashion as brutal and vulgar.

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ERRATA.

- Page 47, line 14, for 'April' read 'Jan.'
 " 51, " 4, " 'last' read 'lack.'
 " 67, " 10, " 'Myiardius' read 'Myiarchus.'
 " 77, " 19, " 'Nyctale' read 'Nyctala.'
 " 89, " 24, " 'Carrington' read 'Carrington.'
 " 117, " 3 and 6 of footnote, for 'Clark' read 'Field.'
 " 120, " 23, for 'sandvicensis' read 'sandvicensis.'
 " 185, " 18, " '1889' read '1891.'
 " 219, " 24, " 'vociferus' read 'vociferans.'
 " 243, " 22, *dele* common after *Corethura*.
 " 268, " 14, for 'oroæcus' read 'oreæcus.'
 " 325, " 14, for '*pavoncella*' read '*Pavoncella*.'
 Plate IV, bottom line, for 'preessing' read 'preening.'

Pravoslav

