

It might be interesting to note that we observed but few locusts in the field, perhaps proving that the Chuñas made special effort to secure them. I imagine that the examination of a large series of gizzard contents would reveal a great variety of food stuff.

The tame birds greedily ate the bodies of birds and rats, while one individual consumed small tacks and broken china without embarrassment. Of special interest perhaps was the finding of the double ovary in two of the specimens, while another female had but the usual single ovary.

It is difficult to estimate just how numerous these birds are. There is one section of the "Gran Chaco" of northeastern Argentina that is called "Campo de las Chuñas" where the natives go each year to secure the eggs of this bird for eating purposes. We believe these to be the same species as *Chunga burmeisteri*; the red-legged variety is said to live in the uplands and on the mountain slopes.

The flesh of this bird is very much esteemed by the natives, who, after carefully boiling the meat, make it into a stew and serve with potatoes, rice, raisins and a quantity of spice which forms quite a palatable dish and, after the usual diet of very young goat or kid, is a most welcome change.

THIRTY-TWO YEARS OF BIRD MIGRATION AT RALEIGH, NORTH CAROLINA.

BY C. S. BRIMLEY.

In the spring of 1885, I first began to fill out migration schedules for the U. S. Biological Survey, and have kept up the habit every succeeding spring since, except in 1902, in which year I made observations, but lost my records, and the little data I have for that spring comes from the dates of a few skins which I collected then. The share others have had in the work is indicated at the end of Table I.

Not only have "arrivals" in spring been noted, but the "lasts"

of winter visitors also, though to a less extent. The fall migration has been taken note of as well, and quite full records have been made both of arrivals and "lasts" at that season from 1885 to 1894, and in 1907 and 1908, while considerable though less abundant observations have been made in nine other years.

I can generalize but little from my observations, the most positive deduction being that a wet spring is liable to be characterized by a comparative abundance of sandpipers and swallows. The weather also, particularly the prevailing temperature during the previous few weeks, has a great effect in hastening or delaying the arrival of the late March migrants, and to a lesser extent the arrival of those reaching us in April. Thus the year 1915, was unusually cold in March and early April, and the early migrants were unusually late, while the opposite was the case with the year 1890.

In making up the average dates for "first seen" and "last seen," abnormally early and later dates have been excluded, as well as those in a species must certainly have been here for some time before it was actually observed. As however, a bird cannot be observed until it is actually present, while it may be overlooked even though here, the average dates of "first seen" are undoubtedly to some extent later than the actual average date of arrival of the species, while the average dates of last seen are of course somewhat earlier, than the actual average dates of departure of the different species.

In all 165 species are included in the following tables, which are, I hope, self explanatory.

I. *Number of species observed in each year of observation.*

Year	Spring Migration		Total	Autumn Migration		
	Arrivals	Lasts		Arrivals	Lasts	Total
1885	59	21	80	36	22	58
1886	59	0	59	46	33	79
1887	67	20	87	44	42	86
1888	69	7	76	41	38	79
1889	65	8	73	37	31	68
1890	54	23	77	32	22	54
1891	59	1	60	33	30	63
1892	61	18	79	25	34	59
1893	53	23	76	50	39	89

Year	Spring Migration		Total	Autumn Migration		Total
	Arrivals	Lasts		Arrivals	Lasts	
1894	61	13	74	29	21	50
1895	42	27	69	31	1	32
1896	50	0	50	1	0	1
1897	50	0	50	5	0	5
1898	57	2	59	24	2	26
1899	39	0	39	15	1	69
1900	58	6	64	5	4	1
1901	41	0	41	—	—	—
1902	17	2	19	—	—	—
1903	35	0	35	—	—	—
1904	34	1	35	—	—	—
1905	28	2	30	15	0	15
1906	33	14	47	11	0	11
1907	54	16	70	17	19	36
1908	49	0	49	24	28	52
1909	55	18	73	—	—	—
1910	11	0	11	—	—	—
1911	45	13	58	11	2	13
1912	52	13	65	—	—	—
1913	12	0	12	—	—	—
1914	35	6	41	3	0	3
1915	68	18	86	6	2	8
1916	56	19	75		(not included)	

The preceding table contains the number of species observed in each year by my brother H. H. Brimley and myself up to about 1892, and from that time to 1916 by myself alone in most years, except that in the spring migration, Mr. S. C. Bruner's records constitute the greater part of the data for "arrivals" in 1908, 1912 and 1915, and more or less of the data for the same in 1907, 1911, and 1913, while he also gave me some autumn records in 1908. Mr. Z. P. Metcalf assisted me very considerably in the spring of 1911, and he and his assistants at the A. and M. College contributed about one half the data for the spring of 1916. Mr. Franklin Sherman and my brother have also contributed much data from time to time.

The autumn data, and the "lasts" of winter birds are almost exclusively my own, or in the earlier years mine and my brother's, but Mr. Bruner furnished a number of interesting "lasts" for the spring of 1915.

II. SUMMER VISITORS.

Note. The number of years in which the species has been observed in the spring and autumn is given in parentheses in those columns. The numbers following the average dates, indicate the number of years on which the average is based.

Name of Species	First Noted in Spring		Last Noted in Autumn	
	Earliest Date	Average	Average	Latest Date
Least Bittern	May 3, '89(3)	May 3(3)	Sept. 11, '88(3)	
Little Blue Heron (a)	June 21, '94(8)	July 8(7)	Aug. 15(4)	Aug. 21, '93(4)
Green Heron	Mch. 29, '93(22)	Apr. 9(21)	Sept. 3(9)	Oct. 2, '94(9)
King Rail (b)	.....	Mch. 28(7)	.....	Nov. 17, '92(3)
Spotted Sandpiper	Apr. 3, '93(26)	Apr. 14(18)	.....	Sept. 14, '86(4)
Broad-winged Hawk	Apr. 4, '98(6)	Apr. 8(4)	.....	Aug. 26, '89(1)
Yellow-billed Cuckoo	Apr. 26, '90(21)	May 5(21)	Oct. 7(9)	Oct. 17, '87(9)
Black-billed Cuckoo	Apr. 30, '00(4)	May 2(3)	Sept. 27(3)	Oct. 10, '91(4)
Chuck-wills-widow	Apr. 10, '90(7)	Apr. 22(7)	.....	Sept. 21, '03(10)
Whip-poor-will (c)	Mch. 31, '16(13)	Apr. 11(13)	Sept. 24(8)	Oct. 17, '92(8)
Nighthawk	Apr. 15, '87(9)	Apr. 27(5)	Sept. 26(9)	Oct. 6, '86(12)
Chimney Swift (d)	Apr. 3, '14(29)	Apr. 15(26)	Sept. 7(10)	Oct. 14, '15(10)
Ruby-throated Hummingbird	Apr. 10, '95(27)	Apr. 17(25)	Sept. 15(11)	Oct. 7, '07(11)
Kingbird	Apr. 12, '15(27)	Apr. 20(25)	Aug. 28(9)	Sept. 18, '93(9)
Crested Flycatcher	Apr. 9, '88&'08(29)	Apr. 18(28)	Sept. 17(9)	Sept. 28, '93(12)
Wood Pewee	Apr. 18, '10&'16(30)	Apr. 25(29)	Oct. 6(10)	Oct. 13, '1(12)
Acadian Flycatcher	Apr. 20, '94(25)	Apr. 29(23)	Sept. 7(7)	Sept. 11, '98(9)
Orchard Oriole	Apr. 16, '88(30)	Apr. 25(30)	Aug. 6(10)	Aug. 22, '93(10)
Grasshopper Sparrow	Mch. 25, '97(18)	Apr. 19(10)	.....	Oct. 22, '93(3)
Chipping Sparrow (e)	Feb. 23, '12(16)	Mch. 8(16)	Oct. 31(4)	Nov. 25, '88(4)
Bachman's Sparrow	Mch. 19, '87(11)	Apr. 5(7)	.....	Sept. 20, '01(1)
Blue Grosbeak	Apr. 25, '88&'16(24)	May 3(24)	Sept. 12(10)	Sept. 27, '87(10)
Indigo Bunting	Apr. 19, '12(27)	May 2(27)	Oct. 7(8)	Oct. 19, '07(9)
Summer Tanager	Apr. 6, '88(29)	Apr. 19(29)	Sept. 7(10)	Oct. 24, '86(11)
Purple Martin (f)	Apr. 8, '12(19)	Apr. 16(11)	Aug. 16(8)	Sept. 9, '97(8)
Rough-winged Swallow	Mch. 28, '08(26)	Apr. 6(18)	July 3(8)	July 17, '86&'08(8)
Red-eyed Vireo	Apr. 6, '88(30)	Apr. 17(30)	Oct. 9(8)	Oct. 16, '07(11)
Yellow-throated Vireo	Apr. 3, '88(32)	Apr. 14(32)	Sept. 1(10)	Sept. 16, '91(10)
Blue-headed Vireo (g)	Mch. 18, '90(23)	Mch. 28(20)	Oct. 28(12)	Nov. 15, '86(12)
White-eyed Vireo (h)	Mch. 24, '99(32)	Apr. 2(29)	Sept. 25(12)	Oct. 16, '07(12)
Black and White Warbler (i)	Mch. 19, '94(29)	Mch. 28(27)	Oct. 8(8)	Oct. 13, '86&'91(9)
Prothonotary Warbler	Apr. 18, '87(4)	Apr. 21(4)	Aug. 19(3)	Aug. 25, '87&'90(4)
Worm-eating Warbler	Apr. 19, '85&'87(14)	Apr. 24(11)	Sept. 2(9)	Sept. 20, '93(9)
Parula Warbler	Apr. 1, '89(26)	Apr. 10(20)	Oct. 9(10)	Oct. 14, '90(12)
Yellow Warbler (j)	Apr. 5, '88(31)	Apr. 17(30)	Aug. 26(6)	Sept. 20, '01(6)
Yellow-throated Warbler	Mch. 13, '90(30)	Mch. 26(29)	Sept. 12(9)	Sept. 20, '01(12)
Prairie Warbler	Apr. 6, '93(29)	Apr. 15(29)	Sept. 4(10)	Sept. 20, '01(11)
Ovenbird (k)	Apr. 7, '92(30)	Apr. 17(27)	Oct. 12(9)	Oct. 23, '85(13)
Louisiana Water-Thrush (l)	Mch. 14, '08(28)	Mch. 29(23)	July 25(8)	Aug. 4, '88(8)
Kentucky Warbler (m)	Apr. 18, '10&'16(17)	Apr. 30(17)	Aug. 29(9)	Oct. 13, '98(9)
Maryland Yellow-throat (n)	Mch. 20, '94(30)	Mch. 28(30)	Oct. 13(8)	Oct. 24, '93(12)
Yellow-breasted Chat	Apr. 18, '88(29)	Apr. 25(29)	Aug. 8(8)	Sept. 13, '01(8)
Hooded Warbler	Apr. 6, '12(28)	Apr. 17(26)	Sept. 13(8)	Oct. 1, '91(12)
Redstart	Apr. 4, '92(31)	Apr. 12(27)	Oct. 3(12)	Oct. 13, '86&'91(12)
Catbird (o)	Apr. 13, '16(31)	Apr. 20(30)	Oct. 17(11)	Nov. 17, '11(11)
Blue-gray Gnatcatcher	Mch. 16, '94(32)	Mch. 28(31)	Sept. 18(11)	Oct. 2, '86&'89(11)
Wood Thrush	Apr. 10, '93(30)	Apr. 18(30)	Oct. 1(10)	Oct. 16, '85(10)

Notes on preceding table of summer visitors.

- (a). Little Blue Heron is a post breeding summer visitor.
- (b). King Rail has been recorded on January 23, 1890, February 29, 1896, March 9, 1905, March 17, 1888, March 23, 1897 and March 30, 1896, so that although we are certain it is only a straggler in winter, we cannot tell which date should go on record as the earliest date of a summer bird.
- (c). The next latest date for Whip-poor-will is October 10, 1885. Excluding the extra late date of November 6, 1894, the average latest is September 19.
- (d). The first dates for Chimney Swifts fall into three groups, the first centering on April 6 (7 yrs.), the next on April 13 (9 yrs.), the last on April 22 (10 yrs.). The breeding birds come on the latter date.
- (e). Chipping Sparrow once taken on December 29, 1890.
- (f). Purple Martin once seen on March 16, 1907.
- (g). Blue-headed Vireo on December 15, 1885, and January 3, 1891.
- (h). White-eyed Vireo on March 3, 1890.
- (i). Black and White Warbler once also on November 10, 1885.
- (j). Yellow Warbler only occasional after August.
- (k). A probably more nearly correct date for the arrival of the Ovenbird is obtained by taking the average of the 19 years giving earliest dates, which gives us April 13 for the average date of arrival.
- (l). I have a single record of the Louisiana Water-Thrush for August 22, 1888, but it was "seen" and not taken, and I think was probably a Water-Thrush.
- (m). Next latest for Kentucky Warbler, September 12, 1894.
- (n). Maryland Yellow-throat also observed on December 6, 1889, January 8, 1891, January 30, February 4, 1890, and February 7, 1889.
- (o). Catbird also seen on January 4, and February 17, 1887, and January 8 and 12, 1910.

III. TRANSIENTS.

Note. The letters "S" and "A" after the name of the species stand for spring and autumn respectively, the numbers after these letters are the number of years the species has been observed in these seasons, the numbers after the averages, the number of years on which the averages are in each case based.

Name of Species	First Seen		Last Seen	
	Earliest Date	Average	Average	Latest Date
Pied-billed Grebe, S(4)	Mch. 15,'99	.....	.....	Apr. 20,'09
" " A(2)	Aug. 7,'08	.....	.....	Sept. 30,'08
Loon, S(1)	Apr. 13,'97 only	.....	.....	.....
" A(2)	Nov. 17,'87	.....	.....	Dec. 9,'96
Black Tern, S(2)	Apr. 18,'07	.....	.....	May 10,'98
" " A(3)	July 28,'84	.....	.....	Sept. 23,'92
Blue-winged Teal, S(5)	Mch. 23,'88	.....	.....	May 6,'89
" " A(2)	Oct. 19,'88	.....	.....	Dec. 7,'93
Bittern (a), S(15)	Mch. 19,'08	Mch. 31(8)	.....	May 30,'93
Virginia Rail S(5)	Mch. 7,'91	Apr. 10(3)	May 3(3)	May 9,'00
" " A(2)	Sept. 8,'96	.....	.....	Oct. 9,'93
Sora Rail, S(10)	Apr. 8,'86	Apr. 22(8)	May 11(4)	May 13,'88&'89
" " A(6)	Aug. 21,'94	Aug. 29(3)	Oct. 13(5)	Oct. 17,'96
Coot, S(4)	Apr. 6,'98	.....	.....	May 16,'84
" A(5)	Oct. 28,'14	Nov. 5(4)	.....	Dec. 1,'82
Pectoral Sandpiper, S(8)	Mch. 22,'93	Mch. 27(5)	Apr. 8(5)	Apr. 15,'15
" " A(1)	Nov. 15,'94 only	.....	.....	.....
White-rumped Sandpiper, S(1)	May 22,'09	.....	.....	May 24,'09
Least Sandpiper, S(5)	Apr. 30,'85	May 2(2)	May 20(5)	May 24,'09
Semipalmated Sandpiper S(1)	May 22,'09 only	.....	.....	.....
Greater Yellow-legs, S(10)	Mch. 22,'93	Apr. 3(8)	May 8(4)	May 29,'88
Yellowlegs, S(10)	Mch. 25,'93	Apr. 3(5)	Apr. 30(4)	May 18,'88
Solitary Sandpiper, S(25)	Apr. 4,'89	Apr. 22(13)	May 17 (12)	May 25,'94
" " A(8)	July 14,'94	July 25(4)	Oct. 6(3)	Oct. 10,'93
Bartramian Sandpiper, S(9)	Mch. 28,'96	Apr. 6(6)	Apr. 24(4)	Apr. 30,'87
Semipalmated Plover, S(2)	May 5,'84	.....	.....	May 22,'09
Pigeon Hawk, S(3)	Apr. 19,'92	.....	.....	Apr. 29,'16
" " A(3)	Sept. 2,'10	.....	.....	Oct. 4,'14
Osprey, S(15)	Mch. 18,'11	Mch. 29(13)	Apr. 20(9)	May 6,'91
" A(1)	Aug. 25,'87 only	.....	.....	.....
Alder Flycatcher, S(1)	May 14,'92	.....	.....	May 16,'92
" " A(2)	Aug. 27,'98	.....	.....	Sept. 21,'93
Bobolink, S(24)	Apr. 19,'88	May 2(24)	May 23(5)	May 27,'87
" A(14)	Aug. 15,'93	Aug. 29(11)	Sept. 29(7)	Oct. 7,'96
Baltimore Oriole, S(3)	Apr. 26,'90	.....	.....	May 4,'15
" A(3)	Aug. 31,'89	.....	.....	Sept. 17,'86
Rusty Blackbird, S(17)	Feb. 15,'90	Mch. 2(10)	Apr. 17(6)	Apr. 26,'87
" " A(12)	Oct. 17,'92	Oct. 28(8)	Nov. 17(8)	Dec. 16,'89
Bronzed Grackle, S(2)	Feb. 26,'95	.....	.....	Mch. 3,'93
" A(6)	Nov. 5,'95	.....	.....	Dec. 11,'95
Henslow's Sparrow, S(7)	Mch. 18,'88	.....	.....	May 3,'01
Leconte's Sparrow, S(1)	Apr. 21,'94 only	.....	.....	.....
White-crowned Sparrow, S(1)	Apr. 14,'12 only	.....	.....	.....

Name of Species	First Seen		Last Seen	
	Earliest Date	Average	Average	Latest Date
Rose-breasted Grosbeak, S(7)	Apr. 22,'09	Apr. 27(4)	May 6(5)	May 8,'85&'97
Scarlet Tanager, S(20)	Apr. 19,'11	Apr. 30(20)	May 11(6)	May 14,'01
" " A(5)	Sept. 11,'86	Sept. 18(3)	Oct. 8(3)	Oct. 14,'91
Barn Swallow, S(22)	Apr. 2,'88	Apr. 10(13)	May 15(10)	May 25,'99
" " A(10)	Aug. 6,'99&'08	Aug. 9(10)	Aug. 30(9)	Sept. 16,'86
Cliff Swallow S(5)	Apr. 20,'11	.....	.....	May 9,'91
Tree Swallow S(16)	Mch. 12,'87	Apr. 4(12)	May 16(5)	May 30,'86
" " A(1)	Sept. 7,'88	.....	.....	Oct. 13,'88
Bank Swallow, S(1)	Apr. 24,'88 only	.....	.....	.....
" " A(1)	Aug. 8,'94 only	.....	.....	.....
Blue-winged Warbler, S(3)	Apr. 26,'12	.....	.....	May 6,'07
" " A(3)	Aug. 20,'08	Aug. 22(3)	Aug. 29(3)	Sept. 4,'88
Brewster's Warbler, A(1)	Sept. 6,'88 only	.....	.....	.....
Golden-winged Warbler, S(2)	May 7,'89&'91	.....	.....	.....
" " A(2)	Aug. 26,'86	.....	.....	Aug. 30,'93
Tennessee Warbler, A(3)	Sept. 19,'89	.....	.....	Oct. 12,'87&'88
Cape May Warbler (b), S(5)	Apr. 7,'92	Apr. 30(3)	May 7(4)	May 9,'92&'11
" " A(1)	Nov. 1,'11 only	.....	.....	.....
Black-throated Blue Warbler (c) S(25)	Apr. 6,'88	Apr. 26(25)	May 13(22)	May 19,'88&'09
Black-throated Blue Warbler (c) A(7)	Sept. 20,'93	Sept. 30(5)	Oct. 18(4)	Nov. 19,'86
Magnolia Warbler, S(4)	May 10,'89	.....	.....	May 15,'93
" " A(7)	Sept. 11,'89	Sept. 13(3)	Oct. 14(4)	Oct. 20,'90
Cerulean Warbler, S(1)	May 8,'93 only	.....	.....	.....
" " A(2)	Aug. 29,'89	.....	.....	Sept. 16,'87
Chestnut-sided Warbler, S(5)	Apr. 27,'86	.....	.....	May 15,'90
" " A(8)	Aug. 17,'91	Aug. 24(4)	Oct. 2(6)	Oct. 12,'91
Bay-breasted Warbler, S(1)	May 5,'15 only	.....	.....	.....
Black-poll Warbler, (d) S(22)	Apr. 16,'16	May 2(15)	May 26(9)	May 31,'92
" " A(10)	Sept. 24,'88	Oct. 2(8)	Oct. 21(9)	Nov. 5,'86
Blackburnian Warbler (c), A(7)	Aug. 25,'87	Aug. 31(3)	Oct. 3(7)	Oct. 13,'91
Black-throated Green Warbler, S(13)	Mch. 22,'96&'97	Mch. 28(10)	.....	May 11,'94
Black-throated Green Warbler, A(7)	Sept. 7,'91	Sept. 19(4)	Oct. 8(5)	Oct. 16,'93
Water-Thrush, S(17)	Apr. 18,'93	Apr. 27(15)	May 20(10)	May 28,'87
" " A(15)	July 25,'95	Aug. 3(7)	Sept. 29(9)	Oct. 6,'94
Connecticut Warbler, A(3)	Oct. 13,'98	.....	.....	Oct. 24,'96
Wilson's Warbler, S(4)	May 11,'93	.....	.....	May 7,'15
Canadian Warbler S(2)	May 13,'92	.....	.....	May 18,'12
House Wren (f) S(18)	Apr. 10,'93	Apr. 20(16)	Apr. 30(9)	May 4,'85
" " A(10)	Sept. 21,'08	Sept. 25(5)	Oct. 11(5)	Oct. 16,'88
Short-billed Marsh Wren, S(1)	May 4,'92 only	.....	.....	.....
" " A(2)	Aug. 10,'94	.....	.....	Sept. 20,'93
Long-billed Marsh Wren(g),S(10)	Apr. 21,'92	Apr. 26(5)	May 5(6)	May 7,'05
" " A(3)	Sept. 20,'92	Sept. 22(3)	.....	Oct. 19,'92
Wilson's Thrush, S(15)	Apr. 23,'85	Apr. 29(9)	May 8(5)	May 9,'85,'91,'92
" " A(6)	Aug. 28,'88	Sept. 1(4)	Sept. 14(3)	Sept. 18,'90
Gray-cheeked Thrush, S(8)	May 4,'94	May 6(3)	May 16(5)	May 24,'92
" " A(4)	Oct. 2,'88	.....	.....	Oct. 12,'88
Bicknell's Thrush, S(3)	May 3,'94	.....	.....	May 18,'89
" " A(2)	Sept. 24,'87	.....	.....	Oct. 12,'87
Olive-backed Thrush, S(13)	Apr. 22,'92	Apr. 29(8)	May 12(6)	May 17,'93
" " A(4)	Sept. 26,'87	Oct. 3(3)	Oct. 16(3)	Oct. 21,'85

Notes on preceding Table.

- (a). Bittern once on December 7, 1886.
- (b). Except for the one taken on April 7, 1892, all the dates for Cape May Warbler fall on or after April 27.
- (c). The earliest date April 6, 1888, is abnormally early for Black-throated Blue Warbler. Next earliest is April 14 of same year, and the next April 17, 1894.
- (d). Next earliest date for Black-poll Warbler is April 26, 1912.
- (e). In 1906 the Blackburnian Warbler was taken in the adjoining county of Durham on May 3, and October 24, by Ernest Seeman.
- (f). I have an extra early date of April 1, 1887, for House Wren, but the bird was seen, not taken, and now think it was a mistake.
- (g). Long-billed Marsh Wren also on January 14, 30, 1890, March 13, 18, 1889, and March 17, 1888.

IV. WINTER VISITORS.

The numbers after the dates have the same meaning as in the case of Summer Visitors.

Name of Species	First Seen		Last Seen	
	Earliest Date	Average	Average	Latest Date
Hooded Merganser	Nov. 4,'88(1)	.....	.....	Jan. 31,'08(1)
Mallard	Nov. 6,'85,'95(6)	Nov. 10(5)	Mch. 31(5)	Apr. 7,'85(5)
Black Duck	Dec. 1,'94(1)	.....	Apr. 6(3)	Apr. 11,'95(5)
Baldpate	Nov. 12,'91(1)	.....	.....	Apr. 26,'92(1)
Green-winged Teal	Dec. 1,'88(2)	.....	.....	Apr. 13,'00(4)
Lesser Scaup Duck	.....	.....	.....	Mch. 28,'08(3)
Wilson's Snipe (a)	Sept. 20,'03(10)	Oct. 26(9)	Apr. 18(14)	Apr. 28,'98(17)
Marsh Hawk	Aug. 15,'96(11)	Sept. 12(5)	Apr. 15(7)	Apr. 29,'87(7)
Long-eared Owl	Dec. 11,'93(2)	Dec. 13(2)	Feb. 22(2)	Feb. 24,'10(3)
Short-eared Owl	Nov. 8,'87(8)	Nov. 23(6)	Jan. 18(4)	Feb. 9,'10(4)
Saw-whet Owl	Dec. 4,'97(3)	.....	.....	Dec. 18,'94
Yellow-bellied Sapsucker	Sept. 27,'87(15)	Oct. 10(12)	Apr. 14(7)	Apr. 29,'87(12)
Horned Lark	Dec. 7,'86(1)	.....	.....	Feb. 20,'95(2)
Prairie Horned Lark	Dec. 7,'86(1)	.....	.....	Feb. 20,'95(2)
Cowbird (b)	Sept. 4,'90(10)	Oct. 17(5)	Apr. 3(9)	Apr. 29,'90(9)
Meadowlark (c)	Aug. 8,'87(18)	Oct. 7(10)	Apr. 20(7)	Apr. 29,'87(10)
Purple Grackle (d)	Oct. 26,'93(12)	Nov. 1(11)	Apr. 15(7)	May 8,'86(13)
Purple Finch	Oct. 28,'89(10)	Nov. 4(10)	Apr. 17(8)	Apr. 30,'90(11)
Pine Siskin	Nov. 3,'86(6)	Nov. 21(6)	May 2(4)	May 11,'11(6)
Lapland Longspur	Jan. 13,'93(2)	.....	.....	Feb. 20,'95
Vesper Sparrow (e)	Oct. 11,'93(12)	Oct. 20(12)	Apr. 12(9)	Apr. 19,'07(13)
Savannah Sparrow	Sept. 16,'87(13)	Oct. 11(13)	May 6(8)	May 13,'16(17)

Name of Species	First Seen			Last Seen
	Earliest Date	Average	Average	Latest Date
White-throated Sparrow	Oct. 4,'88(19)	Oct. 16(19)	May 12(9)	May 19,'15(15)
Slate-colored Junco	Oct. 23,'86(15)	Oct. 31(15)	Apr. 12(13)	Apr. 24,'07(14)
Song Sparrow (f)	Oct. 2,'91(18)	Oct. 13(18)	Apr. 4(14)	Apr. 28,'15(14)
Swamp Sparrow	Oct. 10,'88(13)	Oct. 21(11)	May 11(11)	May 19,'93(15)
Fox Sparrow (g)	Oct. 17,'93(12)	Nov. 15(11)	Mch. 15(9)	Apr. 6,'15(9)
Towhee (h)	Oct. 4,'89(13)	Oct. 11(12)	Apr. 30(16)	May 10,'11(16)
Migrant Shrike (i)	Aug. 18,'88 (21)	Sept. 3(14)	Mch. 25(4)	Apr. 1,'15(7)
Myrtle Warbler	Oct. 11,'86(15)	Oct. 17(13)	May 4(17)	May 18,'93(18)
Yellow Palm Warbler (j)	Sept. 16,'86(12)	Oct. 7(8)	Apr. 19(12)	May 1,'93(18)
Pipit (k)	Oct. 17,'87(6)	Oct. 24(6)	Mch. 22(6)	Apr. 6,'15(6)
Bewick's Wren	Sept. 24,'05(9)	Oct. 18(7)	.....	Apr. 3,'09(1)
Winter Wren	Sept. 26,'87(17)	Oct. 11(13)	Apr. 14(11)	Apr. 23,'90(13)
Brown Creeper	Oct. 3,'88(13)	Oct. 10(10)	Apr. 10(12)	Apr. 19,'15(14)
Red-breasted Nuthatch	Sept. 13,'86(10)	Oct. 7(9)	Mch. 30(4)	Apr. 10,'97(4)
Gold-crowned Kinglet	Oct. 7,'89(14)	Oct. 15(13)	Apr. 5(8)	Apr. 19,'07(8)
Ruby-crowned Kinglet (l)	Oct. 1,'88(20)	Oct. 16(19)	Apr. 20(18)	May 10,'10(18)
Hermit Thrush	Oct. 16,'88(14)	Oct. 21(11)	Apr. 18(19)	Apr. 29,'92(20)

Notes on preceding Table.

- (a). Wilson's Snipe is mainly a spring migrant.
- (b). Cowbird is commonest in spring migration and has been scarcer of late years.
- (c). Meadowlark has been observed June 1, 1913, at Morrisville this county and at Raleigh, June 4, 1916, so is presumably a scarce breeder in this vicinity.
- (d). Purple Grackle also taken on June 16, 1891. It is commonest during the migrations.
- (e). Vesper Sparrow also recorded by me on May 11, 1893, but now think I made a mistake in the identification.
- (f). Second latest date for Song Sparrow is April 11, 1890.
- (g). Second earliest date for Fox Sparrow is November 3, 1886.
- (h). Towhee is commonest in migrations.
- (i). Migrant Shrike is commonest in autumn, scarcest in spring. I have an old record of May 6, 1887, but now think it was a case of mistaken identity.
- (j). Yellow Palm Warbler is rare and irregular in winter. March 31 is the average of nine years of late March and early April dates and may indicate average arrival of transients.
- (k). Pipit also recorded for May 5, 1887, but think it a case of mistaken identity.
- (l). Next latest date for Ruby-crowned Kinglet is April 28, 1887.

V. STRAGGLERS AND SPECIES OF UNCERTAIN STATUS.

- Horned Grebe. January 14, 1909, one taken.
- Sooty Tern. July 1, 1909, one male taken.
- White Pelican. May 12, 1884, one taken.
- Baldpate. November 12, 1891, April 26, 1892.
- Shoveller. March 31, 1902, a pair seen.
- Bufflehead. December 16, 1893, a female taken.
- Old-squaw. January 14, 1910, one taken.
- Wood Ibis, July 4, 1884, one taken.
- Egret. July 15, 1884, one taken.
- Black-crowned Night Heron. April 6, 1915, one taken, April 9, 1916, one seen.
- Yellow-crowned Night Heron. June 25 and July 14, 1894, two immature birds taken. April 4, 1911, four adults seen. April 2, 8, 16, 1915, seen.
- Black Rail. Two taken June 8, 1892. Eggs taken on eight different occasions, in six different years between 1889 and 1902, and on dates ranging from May 27 in 1889 to July 12, in 1894.
- Purple Gallinule. One seen June 3, 1887, one taken three days later.
- Florida Gallinule. April 20, 1907, one brought alive to S. C. Bruner. May 30, 1916, one brought alive to myself.
- Dowitcher. July 29, 1884, one taken.
- Ruff. May 6, 1892, female taken.
- Passenger Pigeon. April 18, 1891, one seen.
- Barn Owl. January 17, 1896, January 5, 1900, specimens taken.
- Bald Eagle. August 24, 1893, adult seen.
- Red-cockaded Woodpecker. April 22, 1890, April 16, 1897, April 20, 28, 1898, also taken at least once in winter by Bruner.
- Crossbill. March 11, 23, 1885, June 5, 1887, January 16, 26, February 8, 1897, May 9, 1907. Specimen taken on the last date by Bruner, and others on the other dates by myself.
- White-winged Crossbill. Three taken by Bruner on February 23, 1907.
- Bachman's Warbler. April 27, and May 22, 1891, two males taken.

VI. SPRING TRANSIENTS AND SUMMER VISITORS.

Arranged in order of their average date of arrival (first seen).

- March 2. Rusty Blackbird.
 8. Chipping Sparrow.
 26. Yellow-throated Warbler.
 27. Pectoral Sandpiper.
 28. King Rail, Blue-headed Vireo, Black and White Warbler, Black-throated Green Warbler, Maryland Yellow-throat, Blue-gray Gnatcatcher.
 29. Osprey, Louisiana Water-Thrush.
 31. Bittern.
- April 2. White-eyed Vireo.
 3. Yellow-legs, Greater Yellow-legs.
 4. Tree Swallow.
 5. Bachman's Sparrow.
 6. Rough-winged Swallow, Bartramian Sandpiper.
 8. Broad-winged Hawk.
 9. Green Heron.
 10. Barn Swallow, Parula Warbler, Virginia Rail.
 11. Whip-poor-will.
 12. Redstart.
 14. Yellow-throated Vireo, Spotted Sandpiper.
 15. Chimney Swift, Prairie Warbler, Purple Martin.
 16. Ruby-throated Hummingbird, Red-eyed Vireo, Yellow Warbler, Ovenbird, Hooded Warbler.
 18. Crested Flycatcher, Wood Thrush.
 19. Grasshopper Sparrow, Summer Tanager.
 20. House Wren, Kingbird, Prothonotary Warbler, Catbird.
 22. Chuck-wills-widow, Sora, Solitary Sandpiper.
 24. Worm-eating Warbler.
 25. Wood Pewee, Orchard Oriole, Yellow-breasted Chat.
 26. Long-billed Marsh Wren, Black-throated Blue Warbler.
 27. Rose-breasted Grosbeak, Water Thrush.

- 29. Acadian Flycatcher, Olive-backed Thrush, Wilson's Thrush.
- 30. Scarlet Tanager, Cape May Warbler, Kentucky Warbler.
- May 2. Least Sandpiper, Bobolink, Indigo Bunting, Black-poll Warbler, Black-billed Cuckoo.
- 3. Blue Grosbeak.
- 5. Yellow-billed Cuckoo, Least Bittern.
- 6. Gray-cheeked Thrush.

VII. AUTUMN TRANSIENTS AND WINTER VISITORS.

Arranged in order of average arrival (first seen).

- July 25. Solitary Sandpiper.
- August 3. Water-Thrush.
- 9. Barn Swallow.
- 22. Blue-winged Warbler.
- 24. Chestnut-sided Warbler.
- 25. Blackburnian Warbler.
- 29. Sora, Bobolink.
- September 1. Wilson's Thrush.
- 3. Migrant Shrike.
- 12. Marsh Hawk.
- 13. Magnolia Warbler.
- 18. Scarlet Tanager.
- 19. Black-throated Green Warbler.
- 22. Long-billed Marsh Wren.
- 25. House Wren.
- 30. Black-throated Blue Warbler.
- October 2. Black-poll Warbler.
- 3. Olive-backed Thrush.
- 7. Meadowlark, Red-breasted Nuthatch, Yellow Palm Warbler.
- 10. Brown Creeper, Yellow-bellied Sapsucker.
- 11. Savannah Sparrow, Towhee, Winter Wren.
- 13. Song Sparrow.
- 15. Gold-crowned Kinglet.

- October 16. White-throated Sparrow, Ruby-crowned Kinglet.
 17. Cowbird, Myrtle Warbler.
 18. Bewick's Wren.
 20. Vesper Sparrow.
 21. Swamp Sparrow.
 24. Pipit.
 26. Wilson's Snipe.
 28. Rusty Blackbird.
 31. Slate-colored Junco.
- November 2. Purple Grackle.
 4. Purple Finch.
 10. Mallard.
 15. Fox Sparrow.
 21. Pine Siskin.
 23. Short-eared Owl.

A REVISION OF THE MARSH WRENS OF CALIFORNIA.¹

BY HARRY S. SWARTH.

AN extensive series of marsh wrens from the delta region east of San Francisco Bay has been accumulated in the California Museum of Vertebrate Zoölogy, chiefly through the personal efforts of Misses Annie M. Alexander and Louise Kellogg. The appearance of these birds contrasts so strongly with specimens available from other parts of California that it has seemed desirable to make a careful study of their systematic status. With this object in view, as many specimens as possible have been assembled illustrative of the Long-billed Marsh Wren (*Telmatodytes palustris*) upon the Pacific Coast, especially in California. Although each of the several collections examined or appealed to contained but a meager representation of the species, still, by assembling material

¹ Contribution from the University of California Museum of Vertebrate Zoölogy.