ARTICLE XVI. — *The Masked Bob-white (Colinus ridgwayi) of Arizona, and its Allies.*—By J. A. ALLEN.

THE Masked or Arizona Bob-white is a comparatively recent addition to the bird fauna of North America, it having been described and named by Mr. William Brewster in April, 1885,* from a single male specimen taken in the State of Sonora, Mexico, a few miles south of the Arizona line, August 11, 1884, by Mr. F. Stephens. The species, however, had been previously mentioned as a bird of Arizona, but under other names, through erroneous identifications. Thus the "*Ortyx virginianus*," reported from Arizona as early as March 6, 1884, by Mr. Herbert Brown,† was in reality the present species. Mr. Brown's specimens then referred to were subsequently seen by Mr. Stephens, and are those mentioned by Mr. Brewster‡ as examined by Mr. Stephens, although this fact was not made known till nearly two years later, when it was first stated by Mr. Brown.‖ In replying to Mr. Brown's reference to the supposed occurrence of *Ortyx virginianus* in Arizona, Mr. Robert Ridgway¶ conjectured that the species thus recorded was either the Massena Quail (*Cyrtonyx massena*) or one of the Mexican species of *Ortyx*, probably *O. graysoni*. Later a nearly complete skin of a female, and fragments of the skin of a male, were sent by Mr. Brown to Dr. George Bird Grinnell, the editor of "Forest and Stream," who submitted them to Mr. Ridgway for identification. From an examination of these imperfect materials Mr. Ridgway pronounced the species to be *Ortyx graysoni* (quite justifiably, as will be shown later), and it was thus recorded by Dr. Grinnell.** These fragmentary specimens†† are those mentioned above as seen by Mr. Stephens.

The next reference to the species is the original description, already cited, of *Colinus ridgwayi* by Mr. Brewster, who does

* Auk, Vol. II, April, 1885, pp. 199, 200.

† Forest and Stream, Vol. XXII, No. 6, March 6, 1884, p. 104.

‡ Auk, Vol. II, 1885, p. 200.

‖ Forest and Stream, Vol. XXV, No. 23, Dec. 31, 1885, p. 445.

¶ Ibid., Vol. XXII, No. 7, March, 13, 1884, p. 124.

** Ibid., Vol. XXII, No. 13, April 24, 1884, p. 243.

†† These specimens are now in the National Museum at Washington. Through the kindness of Mr. Ridgway I have recently had the opportunity of seeing these interesting, and now historic, relics.

not appear to have then been aware that the Arizona specimens referred to in his paper as seen by Mr. Stephens were those already recorded by Dr. Grinnell under the name *Ortyx graysoni.*

Some months later an important paper appeared by Mr. Brown, entitled "Arizona Quail Notes."* It is devoted mainly to an account of the habits and distribution of *Colinus ridgwayi*, with important historical comment on its previous records. Three additional specimens are incidentally mentioned, but not described.† The supposed *Ortyx graysoni* is now, for the first time, unqualifiedly referred to *C. ridgwayi.*

Mr. Brown's article quickly called forth a short paper by Mr. Ridgway, entitled "Arizona Quail,"‡ in which he still maintained the opinion that his first identification of *Ortyx graysoni* from Arizona was correct; at least he did not think that Mr. Brown had "demonstrated the specific identity of *Colinus ridgwayi* Brewst. and the pair of birds, sent by Mr. Brown to Mr. Grinnell, which I [Ridgway] identified as *Ortyx* (now *Colinus*) *graysoni* Lawr." Mr. Ridgway had then, however, seen no other specimens, and guardedly adds: "I would note that much additional material, including specimens in much better shape than those already examined, is necessary to determine the question of whether *C. graysoni* occurs in Arizona, and also that of its relation to *C. ridgwayi.*" Mr. Ridgway's material had consisted practically of a badly prepared or half-mummified female, the few fragments of the male skin examined being non-characteristic; and the females of the species of *Colinus* occurring along the southwestern border of the United States are, as Mr. Ridgway adds, "practically indistinguishable from one another."

The next notice of the Arizona Bob-white is my short reference, published three months since,‖ to Mr. Brown's recently collected material which forms the basis of the present paper. Mr. W. E. D. Scott's later reference¶ concludes the written history of the species, which thus far includes a description of the

* Forest and Stream, Vol. XXV, No. 23, Dec. 31, 1885, p. 445.

† They are now before me, having been purchased by the American Museum of Natural History.

‡ Forest and Stream, Vol. XXV, No. 25, Jan. 14, 1886, p. 484.

‖ Auk, Vol. III, April, 1886, pp. 275, 276.

¶ Ibid., Vol. III, July, 1886, p. 387.

male bird only, and this based on a single somewhat exceptional example.*

At present the material extant consists of nineteen specimens, all, excepting Mr. Stephens's single Sonoran one, collected in Southern Arizona by Mr. Herbert Brown of Tucson, to whom we are indebted for nearly all that is at present known of the species. These specimens are (1) the imperfect female and a few fragments of a male (portions of the breast, tail, and one wing) already mentioned as being in the National Museum at Washington—nominally two specimens; (2) a male and female in the collection of Mr. Manly Hardy, of Brewer, Maine; (3) two males and two

* The bibliography of the species is at present practically as follows:

1884. [Brown, Herbert.] *Ortyx Virginianus* in Arizona. <*Forest and Stream*, Vol. XXII, No. 6, March 6, 1884, p. 104. (From Tucson "Weekly Citizen," date of issue not given.)

A note of eleven lines, announcing the capture of "a pair of genuine Bob White quail....in the Barboquivari range, about sixty miles southwest of Tuscon [=Tucson]."

1884. Ridgway, Robert. *Ortyx Virginianus* not in Arizona. <*Forest and Stream*, Vol. XXII, No. 7, March 13, 1884, p. 124.

Refers to the note from the Tucson "Weekly Citizen," given in the preceding number of "Forest and Stream." The bird is presumed to be the Massena Quail (*Cyrtonyx massena*), but if not this it is thought that it "must be one of the Mexican species of *Ortyx* (perhaps *O. graysoni*)."

1884. Grinnell, Geo. Bird. A Quail new to the United States Fauna. <*Forest and Stream*, Vol. XXII, No. 13, April 24, 1884, p. 243.

Identified as *Ortyx graysoni* by Mr. Robert Ridgway, from "an almost complete skin of a female bird, and portions of the wing, breast and tail of a male," collected by Mr. Herbert Brown and submitted to Mr. Ridgway by Dr. Grinnell. The article gives an account of the range of the species in Arizona, as then known, with notes on its habits.

1885. Brewster, William. Additional notes on some birds collected in Arizona and the adjoining Province of Sonora, Mexico, by Mr. F. Stephens in 1884; with a description of a new species of *Ortyx* [=*Colinus*]. <*Auk*, Vol. II, April, 1885, pp. 196–200.

Colinus ridgwayi, spec. nov., described (p. 199) from a male taken by Mr. Stephens about eighteen miles southwest of Sasabe, Sonora, Mexico, very near the Arizona boundary. Arizona specimens are reported as having been seen and examined by Mr. Stephens. These, it turns out, were the specimens previously identified by Mr. Ridgway as *Ortyx graysoni*.

1885. Brown, Herbert. Arizona Quail notes. <*Forest and Stream*, Vol. XXV, No. 23, Dec. 31, 1885, p. 445.

An article of a column and a half in length, chiefly on *Colinus ridgwayi*, which is announced as the bird previously identified as *Ortyx graysoni* by Mr. Ridgway. A quite detailed account of its habits and distribution is given, with comment on previous records of the species.

1886. Ridgway, Robert. Arizona Quail. <*Forest and Stream*, Vol. XXV, No. 25, Jan. 14, 1886, p. 484.

Mr. Ridgway does not think "that Mr. Brown has demonstrated the specific identity of *Colinus ridgwayi*, Brewst. and the pair of birds I [he] identified as *Ortyx* (now *Colinus*) *graysoni*, Lawr. To make the matter perfectly clear" he reviews "the history of the subject," and to aid further investigations gives an "artificial key," based on the males, "of the species of *Colinus* found along our southwestern border, including the *C. graysoni*."

1886. Allen, J. A. The Masked Bob-white (*Colinus ridgwayi*) in Arizona. <*Auk*, Vol. III, 1886, pp. 275, 276.

Note of half a page in length on Mr. Brown's specimens, described in the present paper.

1886. Scott, W. E. D. On the Avi-fauna of Pinal County, with remarks on some Birds of Pima and Gila Counties, Arizona. Part II. <*Auk*, Vol. III, 1886, pp. 383–389.

Short note on *Colinus ridgwayi* at p. 387, referring to Mr. Brown's specimens and observations.

females in the American Museum of Natural History of New York; (4) five males and five females in the collection of Mr. George B. Sennett; and (5) a male, taken in Sonora, Mexico, in the collection of Mr. F. Stephens. All of this material I have had in hand for examination, and nearly all is now before me, and, in addition, a series of nine specimens of *Colinus graysoni*, and several specimens each of *C. coyolcos* and *C. pectoralis*, kindly loaned by the National Museum and Mr. George N. Lawrence. Also about thirty specimens of *C. virginianus texanus*, from Mr. Sennett's collection, collected on the Lower Rio Grande in Texas.*

The species of the genus *Colinus* present a most interesting and puzzling group, consisting of a number of obviously more or less unstable forms, evidently derived, at no very remote period, from some common ancestor. Yet in their extreme phases few congeneric forms present greater diversity of color than is seen, for example, in *Colinus virginianus* on the one hand, with its white head- and throat-markings and barred black and white lower plumage, and *C. coyolcos* on the other, with its wholly black head, neck, and upper breast and uniform deep cinnamon lower parts. Yet there are various stages of intergradation in color, through the intermediate forms *C. graysoni*, *C. ridgwayi*, and *C. pectoralis*, while different individuals of these several transitional forms present a suggestive inconstancy in color-markings. There is practically no decisive difference in any details of form or in size, the individual variation among representatives of either type overlapping any average differences in these features that may be taken as distinctive from their next allied forms; while the females of several of them are not, *inter se*, always certainly distinguishable by any features.

The leading differences presented by the males may be indicated as follows:

A. Throat, forehead, and superciliary stripes *white* bordered with black; the white throat-patch bounded posteriorly by a black collar.

a. Breast brownish red; rest of lower plumage white, with bars and more or less pointed V-shaped marks of black, and with broad streaks of cinnamon on the sides.....*C. virginianus* and vars.

*It gives me pleasure to acknowledge in this connection my indebtedness to Mr. Ridgway for his kindness in securing to me the use of the material loaned me by the National Museum, and to Messrs. Lawrence, Sennett, and Hardy for the use of the specimens they have very kindly placed at my disposal, since without such assistance the preparation of the present paper would have been impossible.

b. Breast and whole lower plumage uniform cinnamon, with usually distinct touches of black and white on the flanks, and sometimes over the sides and abdomen..... .....*C. graysoni.*

c. Breast and lower plumage as in *C. graysoni*, with the same tendency to black and white spotting, but the black collar bordering the white throat-patch expanded and covering the breast.....*C. pectoralis.*

B. Throat *black;* superciliary stripe and white line on the forehead wanting, or inconstant; sometimes both well-developed; the superciliary stripe generally more or less well defined, or at least distinctly traceable.

a. Black of lower parts confined to the throat and foreneck...*C. ridgwayi.*

b. Black of lower parts extending posteriorly over the whole breast, and the cinnamon tint deepening into chestnut.....*C. coyolcos.*

In respect to the dorsal aspect, the males fall into three groups, in accordance with the amount and depth of the dark tints. Thus in *C. coyolcos* and *C. pectoralis* the blackish tints predominate, as is also the case with highly colored examples of *C. graysoni*, in which the dark tints not only prevail, but are intensified to nearly deep black, and the light markings are reduced to a minimum. *C. ridgwayi* and *C. virginianus texanus*, on the other hand, present the maximum amount of light markings, the creamy white spots and edgings of the scapulars and inner secondaries being the conspicuous feature, while the dark tints are greatly reduced in area and are much less deep in tone, being merely blackish brown. In *C. virginianus* proper the dark markings are coarser and browner than in the last-named forms, and of a more reddish cast of brownish black, while the rufous tints generally are stronger and purer, and the light edging of the inner secondaries is deeper or more tawny. In general effect the dorsal aspect in *C. virginianus* proper is rufous, with a slight cast of glaucous gray, relieved with tawny and blackish brown; in *C. virginianus texanus* and in *C. ridgwayi* it is gray varied with reddish brown, relieved with fine markings of blackish and grayish white, the latter so far prevailing as to give character to the general effect. In *C. coyolcos* and *C. pectoralis*, and in somewhat less degree in *C. graysoni*, the general effect is blackish, relieved with fine touches of white or yellowish-white. In dorsal aspect *C. coyolcos* and *C. pectoralis* are practically indistinguishable, while highly colored specimens of *C. graysoni* are practically similar. On the other hand, light colored examples of *C. graysoni* grade directly into highly colored speci-

mens of *C. ridgwayi*, while the paler examples of the latter grade indistinguishably into Rio Grande specimens of *C. virginianus texanus*. Between this and *C. virginianus* there is the widest gap in the series, through the stronger tone of rufous everywhere prevailing, and the absence of the minutely variegated effect of light and dark tints in *C. virginianus*.

The females of these forms, it is safe to say, cannot be in all cases satisfactorily separated. So far as my present material goes, the female of *C. virginianus* proper differs markedly from the females of all the other forms, it being quite distinct and easily separable with certainty from even the females of *C. virginianus texanus*.

The females of *C. coyolcos* and *C. pectoralis* are practically, and, so far as my material goes, absolutely inseparable, nor can either with certainty be separated from the darker females of *C. graysoni*, while the lighter females of *graysoni* cannot with certainty be distinguished from the females of *C. ridgwayi*. The females of *C. ridgwayi*, again, cannot readily be told from females of *C. virginianus texanus*. There is, however, a slight but quite appreciable average difference between them, easily recognized in comparing a series of each, but of so intangible a character as not to be easily indicated in words. There is also a still stronger average difference between the females of *C. ridgwayi* and *C. graysoni*; as there is also between the females of the latter and those of *C. pectoralis* and *C. coyolcos*.

Although *C. coyolcos* is the smallest of the forms here considered, neither size nor, as will be shown later, any other character can be relied on to distinguish it from *C. pectoralis*, although it may average very appreciably smaller. *C. graysoni* distinctly intergrades in size with *C. ridgwayi*, as shown by the measurements of these two species given beyond, though averaging smaller. *C. ridgwayi*, therefore, is the largest of the forms having uniform cinnamon colored under-parts. It, however, averages smaller than *C. virginianus* (verus), while *C. virginianus floridanus* and *C. v. texanus* correspond in size with *C. pectoralis*, this species and *C. coyolcos* holding about the same relation in respect to size to *C. graysoni* and *C. ridgwayi* that the subspecies of *C. virginianus* do to *virginianus* proper.

The subjoined table of measurements of the wing, tail, and tarsus in the male of these several forms will serve to illustrate these statements as to size. The range of individual variation in these parts will be more fully shown in other tables to be given later.

MEASUREMENTS OF THE WING, TAIL, AND TARSUS OF THE MALE IN SEVEN SPECIES AND SUBSPECIES OF THE GENUS *Colinus*.

Species.	Number of Specimens.		Wing.	Tail.	Tarsus.
C. coyolcos.....	2	Largest.	4.10	2.50	1.10
	2	Smallest.	4.00	2.25	1.10
	2	**Average.**	**4.05**	**2.38**	**1.10**
C. pectoralis	2	Largest.	4.65	2 65	1.15
	2	Smallest.	3.75	2.27	1.00
	2	**Average.**	**4.20**	**2.46**	**1.08**
C. graysoni.....	6	Largest.	4.45	2.90	1.25
	6	Smallest.	4.20	2.45	1.10
	6	**Average.**	**4.31**	**2.72**	**1.16**
C. ridgwayi.....	8	Largest.	4.65	3.00	1.25
	8	Smallest.	4.35	2.65	1.15
	8	**Average.**	**4.45**	**2.84**	**1.20**
C. virginianus.....	7	Largest.	4.60	3.00	
	7	Smallest.	4.37	2.55	
	7	**Average.**	**4.47**	**2.82**	
C. floridanus.....	16	Largest.	4.50	3.00	
	16	Smallest.	4.00	2.30	
	16	**Average.**	**4.22**	**2.52**	
C. texanus.....	10	Largest.	4.45	2.75	1.20
	10	Smallest.	4.00	2.25	1.10
	10	**Average.**	**4.17**	**2.51**	**1.14**

Colinus ridgwayi. MASKED BOB-WHITE.

(PLATE XXIII.)

Ortyx virginianus [BROWN], Forest and Stream, XXII, No. 6, 1884, 104. (First published notice of the species.)

Ortyx graysoni GRINNELL (*ex* RIDGWAY), Forest and Stream, XXII, No. 13, Apr. 24, 1884, 243. (First identified as *O. graysoni*.)

1886.]

Colinus graysoni RIDGWAY, Forest and Stream, XXV, No. 25, Jan. 14, 1886, 484.—A. O. U. Check List N. A. Birds, 1886, 168.

Colinus ridgwayi BREWSTER, Auk, II, April, 1885, 199.—BROWN, Forest and Stream, XXV, No. 23, Dec. 31, 1885, 445.—A. O. U. Check List N. A. Birds, 1886, 168.—ALLEN, Auk, III, April, 1886, 275.—SCOTT, ibid., July, 1886, 387.

DESCRIPTION.—*Adult Male.*—Front part of head, sides of head and neck, and throat black, with or without a narrow white frontal line and white superciliary stripes, which are sometimes well-defined and conspicuous, but usually more or less obsolete, with little or no white in front of the eyes (rarely wholly wanting); lower parts cinnamon, varying in different specimens from pale cinnamon to very deep cinnamon, generally unspotted except on the flanks and crissum, which are sometimes almost immaculate, but the flank feathers are usually distinctly tipped with an oval spot of white, preceded by a subterminal bar of black, and the lower tail-coverts have a V-shaped spot of black, broadly bordered with whitish; occasionally there are small touches of black and white along the sides; crown, hind-head, and nape mixed black, white, and pale brown, the latter frequently varying to yellowish-white; hind-neck and interscapulars reddish-brown, slightly darker than the color of the breast, with usually a slight grayish or glaucous cast; back, rump, and upper tail-coverts minutely variegated with blackish, pale brown, and grayish-white, the black usually prevailing, and varying in amount in different specimens; wing-coverts rufous (varying greatly in intensity in different specimens), each feather barred with blackish and edged and tipped more or less broadly with grayish- or yellowish-white; primaries blackish-brown, edged and scalloped externally with whitish; secondaries externally blackish-brown, barred and freckled with pale brown and yellowish-white; scapulars and "tertiaries" (including the innermost secondaries) edged with yellowish-white (very broadly so on the inner edge), and variegated with deep blackish-brown, pale rufous, and yellowish-gray, the black prevailing; tail above bluish-gray, minutely freckled and waved, particularly toward the tip, with grayish-white, varying to yellowish-white; tail below gray, faintly and irregularly barred and

waved with grayish-white; bill deep black, extreme tip sometimes lighter; legs and feet horn color, darkest on the feet; "iris brown." Length,* 9,75 inches; extent,* 14,34; wing,† 4,45; tail, 2,70; tarsus, 1,20.

Adult Female.—Above as in the male, but generally somewhat lighter or grayer, but the darker colored females are indistinguishable above from the very pale males; broad superciliary stripes, meeting on the forehead, and the throat yellowish-white, usually uniform over the whole throat, but sometimes lightening on the central and upper part to nearly pure white; a narrow, not well defined collar of black spots bordering the white throat patch posteriorly; breast rufous, lightening to cinnamon on the sides and flanks, the breast marked with small spots of black and soiled white, and the sides and flanks with coarse V-shaped marks of black, and terminal elongated spots of white; lower breast and abdomen soiled grayish- or buffy-white, each feather barred subterminally with black, the bar V-shaped or pointed in the middle, and behind it, especially centrally, a narrow bar of rufous; in some specimens the black bars are nearly transverse, lacking the V-shaped point.‡ Bill, feet, and iris as in the male. Length,‖ 9,66; extent,‖ 14,40; wing,¶ 4,39; tail, 2,81; tarsus, 1,16. The female averages very slightly smaller in measurements than the male, but appears to slightly exceed the male in weight. Thus Mr. Brown, in a letter of March 30, 1886, gives the weights of ten specimens, five males and five females, with the entrails removed, as follows: males, two four ounces each, one four and a half, and two five ounces each; females, one four and a half, one four and three-quarters, one five, one five and a half, and one six. The females thus average one-fourth of an ounce *heavier* than the males.

The color of the lower parts in the male is very similar to that of the same parts in the common Robin (*Merula migratoria*), and varies similarly, but rather more, in intensity in different indi-

* Collector's measurements; average of six specimens.

† Measurements of wing, tail, and tarsus from skins; average of nine specimens.

‡ Of the six females before me as I write three have the bars transverse, while in the other three they are more or less V-shaped in the middle—as much so as in average *C. virginianus texanus*, or as in the females of *C. graysoni*.

‖ Collector's measurements; average of seven specimens.

¶ Measurements of wing, tail, and tarsus from skins; average of seven specimens.

viduals, perhaps with age. But the most conspicuous variation is in the white markings of the head. These are sometimes wholly wanting, as in the Sonoran specimen described by Mr. Brewster. In others, as in one of the males before me, there is no white on the forehead or in front of the eye, but there are slight touches of white behind the eye, which become so numerous from a point above the ear and thence posteriorly as to be barely suggestive of a stripe. In another example, there are a few touches of white above the eye, and a white postocular stripe, which becomes quite broad where it terminates on the side of the neck. Three other specimens are similarly marked with a lateral head stripe extending as far forward as the eye—in one of them as far as the front border of the eye. Two specimens have well-defined but rather narrow white superciliary stripes running from the nape to the nostrils. What is still further suggestive of a close relationship to *C. graysoni* is the presence of touches of white on the throat in nearly every specimen, varying from the merest touch on a very few feathers in some examples to well-defined and quite conspicuous blotches in others. The material now at hand merely shows indications of intergradation with that species. Exploration of the considerable portion of Northern Mexico which separates the localities whence comes the material now in hand, representing these two forms, may show that they are merely geographical extremes of a single species. Such a result, to say the least, would certainly not be surprising. The chief difference between the two forms is the slightly larger average size of *C. ridgwayi*, its rather paler colors (as would be expected, respectively, from its more northern and more desert habitat), and black instead of white throat, and the tendency to absence of white frontal and superciliary stripes.

The amount of spotting on the flanks and the lower tail-coverts varies greatly in different specimens, in some the spots being reduced to a few slight touches of black and white on the flanks, and on the coverts to mere shaft-lines of black and obsolete touches of white; in other specimens the spots on the flanks are numerous and large, while the lower tail-coverts are marked conspicuously with black and white, the longer middle feathers being sometimes crossed with a series of V-shaped black bars, separated

by white. In some of the specimens which have the flanks coarsely spotted the lower tail-coverts are almost immaculate, having but the slightest indications of either black or white touches. In short, each specimen may be said to differ very considerably in details of color-markings from all the others, as is found to be the case also in *C. graysoni*. The spotting on the flanks, and the general color beneath in the darker specimens, and also the markings on the lower tail-coverts, it may be added, are precisely the same as in *C. graysoni*, and equally inconstant.

The females, *inter se*, vary much less than the males, the chief differences being in the intensity of the tints. Several of the females, however, show slight touches of black in the cream-colored throat-patch, one being quite conspicuously thus freckled with black, while another has the greater part of the throat-patch solid black. (See Plate XXIII, lower right hand figure.) This may be merely an old female taking on male characters, as sometimes happens among the Gallinæ, but there is no other feature indicative of such a change, or of very old age; hence this may indicate merely the unstable character of the form, in respect especially to the white and black head- and throat-markings.

As already said, the females of *C. ridgwayi* are not certainly distinguishable from the females of either *C. graysoni* or *C. virginianus texanus*, particularly the latter. There are specimens of the latter in Mr. Sennett's collection that are absolutely indistinguishable from females of *C. ridgwayi* except by the labels, without which it would be impossible to say with certainty whether they came from the Lower Rio Grande region of Texas or from Arizona. Generally the female of *C. ridgwayi* shows more rufous and less black on the breast, but this is by no means uniformly the case, the average difference in this respect being slight. Yet the males of these two forms show no tendency to intergradation.

The subjoined tables indicate the range of variation of *C. ridgwayi* in measurements, and its comparative dimensions as compared with a similar series of *C. graysoni* and *C. virginianus texanus*, both of which, it will be seen, average somewhat smaller than *C. ridgwayi*.

MEASUREMENTS OF SIXTEEN SPECIMENS OF *Colinus ridgwayi*.

Collection.	Sex and age.	Locality.	Date.	Collector.	Length*	Extent*	Wing.	Tail.	Tarsus.
G. B. Sennett.....	♂ ad.	Barboquivari Mountains, Arizona.....	Sept. 28, 1885.	Herbert Brown.	....	.....	4.55	2.85	1.23
Am. Mus. Nat. Hist.	♂ ad.	" " "	" 28, 1885.	" "	....	.....	4.45	2.70	1.20
" "	♂ ad.	" " "	" 27, 1885.	" "	...	.....	4.65	2.80	1.25
G. B. Sennett.....	♂ ad.	" " "	Feb. 4, 1886.	" "	9.50	14.20	4.40	2.65†	1.15
" "	♂ ad.	" " "	" 5, 1886.	" "	9.50	14.12	4.35	2.85	1.15
" "	♂ ad.	" " "	" 8, 1886.	" "	9.75	14.12	4.40	3.00	1.20
" "	♂ ad.	" " "	" 8, 1886.	" "	9.75	14.50	4.35	3.00	1.20
M. Hardy.....	♂ ad.	" " "	" 8, 1886.	" "	10.30	14.60	4.45	2.80	1.20
F. Stephens.....	♂ ad.	Sasabe, Sonora, Mexico.....	Aug. 11, 1884.	F. Stephens.	9.70	14.50	4.45	2.75	1.20
Am. Mus. Nat. Hist.	♀ ad.	Barboquivari Mountains, Arizona.....	Feb. 4, 1886.	Herbert Brown.	9.60	14.20	4.50	2.80	1.15
" "	♀ ad.	" " "	" 8, 1886.	" "	9.50	14.15	4.25	2.80	1.15
G. B. Sennett.....	♀ ad.	" " "	" 8, 1886.	" "	9.50	14.75	4.50	2.90	1.12
" "	♀ ad.	" " "	" 8, 1886.	" "	9.75	14.60	4.40	2.87	1.20
" "	♀ ad.	" " "	" 8, 1886.	" "	9.75	14.50	4.45	2.82	1.15
" "	♀ ad.	" " "	" 12, 1886.	" "	9.75	14.40	4.25	2.75	1.20
" "	♀ ad.	" " "	" 12, 1886.	" "	9.80	14.50	4.45	2.80	1.15
M. Hardy.	♀ ad.	" " "	" 4, 1885.	" "	9.75	14.25	4.25	2.75	1.12

* Collector's measurements from fresh specimens. † Tail imperfect.

MEASUREMENTS OF NINE SPECIMENS OF *Colinus graysoni*.

National Museum Number.	Collector's Number.	Sex and age.	Locality.	Date.	Collector.	Wing.	Tail.	Tarsus.
50883*	500	♂ ad.	Near Guadalajara, Mexico		Col. A. J. Grayson.	4.35	2.45	1.20
81926	...	♂ ad.	Guanajuato, Mexico		Prof. A. Dugès.	4.20	2.90	1.25
81927	...	♂ ad.	" "		" "	4.45	2.90	1.10
78092	...	♂ ad.	Jupataro, Guanajuato, Mexico		" "	4.35	2.75	1.12
105478	...	♂ ad.	Moro Leon, " "		" "	4.20	2.60	1.12
85970	...	♂ ad.	Tupataro, Mexico		" "	4.33	2.75	1.20
52766	502	♀ ad.	Guadalajara, Mexico		Col. A. J. Grayson.	4.37	2.55	1.25
42568	501	♀ ad.	" "		" "	4.30	2.60	1.20
78091	...	♀ ad.	Jupataro, Guanajuato, Mexico		Prof. A. Dugès.	4.40	2.75	1.25

* Collection of Mr. George N. Lawrence.

MEASUREMENTS OF SEVENTEEN SPECIMENS OF *Colinus virginianus texanus*.

Collection of G. B. Sennett.	Sex and Age.	Locality.	Date.	Collector.	Extent†	Length†	Wing.	Tail.	Tarsus.
353	♂ ad.	Hidalgo, Texas	May 3, 1877.	G. B. Sennett.	9.50	14.65	4.30	2.62	1.16
430	♂ ad.	Lomita, "	" 15, 1878.	" "	9.25	13.75	4.12	2.60	1.10
1375	♂ ad.	" "	July 22, 1880.	M. A. Frazar.	....	.....	4.12	2.55	1.12
1389	♂ ad.	" "	" 28, 1880.	" "	....	.....	4.00	2.45	1.12
1455	♂ ad.	" "	Aug. 16, 1880.	" "	...	.....	4.00	2.37	1.12
1483	♂ ad.	" "	" 24, 1880.	" "	....	.....	4.25	2.50	1.12
1489	♂ ad.	" "	" 26, 1880.	" "	...	.....	4.10	2.25	1.15
1490	♂ ad.	" "	" 26, 1880.	" "	....	.....	4.20	2.35	1.15
1510	♂ ad.	Santa Maria, Texas	Sept. 22, 1880.	" "	...	.....	4.15	2.70	1.20
1868	♂ ad.	Point Isabel, "	Mch. 2, 1881.	" "	....	.....	4.45	2.75	1.20
208*	♀ ad.	Nueva Leon, Mexico	May, 1853.	Lieut. D. N. Couch.	9.00	13.75	4.12	2.50	1.15
93	♀ ad.	Brownsville, Texas	Mch. 27, 1877.	G. B. Sennett.	9.00	14.25	4.12	2.60	1.19
140	♀ ad.	Lomita, "	April 19, 1878.	" "	9.50	14.50	4.17	2.45	1.13
352	♀ ad.	Hidalgo, "	May 3, 1877.	" "	9.50	14.25	4.05	2.35	1.05
1511	♀ ad.	Santa Maria, "	Sept. 22, 1880.	M. A. Frazar.	....	.....	4.00	2.45	1.10
1512	♀ ad.	" "	" 22, 1880.	" "	....	.....	4.35	2.65	1.18
1513	♀ ad.	" "	" 22, 1880.	" "	....	.....	4.05	2.60	1.25

* Collection of Mr. George N. Lawrence. † Collector's measurements from fresh specimens.

HABITS AND DISTRIBUTION.—According to Mr. Brown, to whom we are indebted for nearly all we as yet know on these points, the Arizona Bob-white has a restricted distribution in Arizona, where it is limited to the southern border of the Territory. It is doubtless properly a Mexican species, which extends northward for only a short distance beyond the Arizona line, and southward into Mexico for an unknown distance, where possibly—we may almost say probably—it merges into *C. graysoni*. The only Mexican specimen at present known is the one already repeatedly cited as taken in Sonora, about ten miles south of the Arizona line.

According to Mr. Brown, the Arizona Bob-white has long been known "to every old time resident of Southern Arizona," by whom it was supposed to be the same as the well-known Bob-white (*C. virginianus*) of the Eastern States.* He gives its habitat as "the country lying between the Barboquivari range in Arizona and the Gulf coast in Sonora, and more especially between the Barboquivari and Plumosa, [where] this species is quite abundant. ....The 'hooded quail' (*Colinus ridgwayi*) was, three years since [in 1882], abundant in the neighborhood of Bolle's Well, a stage station on the Quijotoa road, near the northern end of the Barboquivari range, twenty-nine miles southwest of Tucson, and about forty miles north of the Mexican boundary line. As the station was then comparatively new, the grass thereabouts was high, and these quails could be had for the taking; but now that stock has eaten away the grass, the birds have not, for a year or more, been seen about the place.

"On the road from Bolle's Well west to the Coyote range (about twenty-five miles), these quails were frequently to be met with, but teamsters and travelers have killed or frightened them off. One of the former assured me that he had killed as many as five at one shot. Ten miles south of Bolle's, in the Altar Valley, we came across a small covey—there were, perhaps, a dozen in all. The bright, deep chestnut breast plumage of the males looked red in the sun, and gave the birds a most magnificent appearance. We secured but one, a male, the rest secreting themselves in the

* Forest and Stream, Vol. XXII, No. 6, March 6, 1884, p. 104; ibid., Vol. XXV, No. 23, Dec. 31, 1885, 445.

tall sacaton grass, which at this point was between four and five feet high, and as we had no dog we did not follow them in. Our next place to find them was on the mesa southeast of the [Barboquivari] Peak, where we camped to hunt for them, but they were scarce, and we managed to secure but few....

"The base of the Barboquivari range is at intervals broken into immense canyons, which lie at right angles with the main body of the mountain, and stretch far to the plains below. For a mile or more after leaving the base proper, they are filled with an almost impenetrable growth of underbrush, weeds and grass. Lower down, however, they flatten out and largely lose their canyon characteristics, but seldom sufficiently so to be the feeding ground of *Colinus ridgwayi*. To determine this point we worked these canyons for two consecutive days in vain, inasmuch as we failed to see or hear one, other than those on the intervening mesas."*

In a letter dated Feb. 9, 1886, Mr. Brown writes me that the collectors whom he had sent out especially for these birds reported to him as "having found but one small flock in a tramp of four days, and out of it they succeeded in getting the five [sent at this date]. This was in the Altar Valley." In a later letter (date of April 24, 1886), Mr. Brown states that the Quails he sent me "were taken at least eighteen miles north of the Sonora line.... Thirty-three or thirty-five miles is the farthest north of the line that I have ever known this Quail."

In respect to habits, Mr. Brown, in his "Forest and Stream" articles already cited, says that, so far as he knows them, "they appear to resemble very closely those of the common quail [*C. virginianus*], only slightly modified by the conditions of their environment. They utter the characteristic call, 'Bob White,' with bold, full notes, and perch on rocks and bushes when calling. They do not appear to be at all a mountain bird, but live on the mesa, in the valleys, and possibly in the foothills.... In addition to their 'Bob White' they have a second call of *hoo-we*, articulated and as clean cut as their Bob White. This call of *hoo-we* they use when scattered, and more especially do they use it when separated toward nightfall. At this hour I noted that, although they occasionally called 'Bob White' they never repeated the

* Forest and Stream, Vol. XXV, No. 23, Dec. 31, 1885, p. 445.

first syllable, as in the day time they now and then attempted to do....I will venture to say that when frightened and scattered they are a hard bird to get. Hear one call, locate it as you may, see one fly and mark it down, and without a dog it is virtually impossible to flush it."

The specimens taken the last of September had not completed their moult.

Mr. Brown describes their food as consisting of berries, seeds, succulent leaves of plants, and insects, the latter including grasshoppers and various species of small beetles, from minute ones to a curculio half an inch long, and an hemipterous insect of about the same size. The seeds are of various species of plants, a coarse seed of cylindrical form prevailing, as shown by the stomachs of ten specimens kindly sent me by Mr. Brown for examination.

NOTE ON *Colinus pectoralis* AND *C. coyolcos* AND THEIR RELATIONS TO *C. graysoni* AND *C. ridgwayi*.—In size and coloration *Colinus pectoralis* and *C. graysoni* are closely related,* the only difference of importance being the expansion of the frontal black collar from a narrow band of usually less than half an inch in width in *C. graysoni* to a broad patch an inch and a half or more in width, and covering nearly the whole breast, in *C. pectoralis*. It is not distinguishable likewise from *C. coyolcos* in either size† or coloration, except that in the extreme phase of the latter the white head- and throat-markings are entirely replaced by black, as in the specimen from Mr. Lawrence's collection. Another specimen (Nat. Mus. No. 58,923), however, has quite broad white superciliary stripes which meet on the forehead, and also a patch of white on each side of the throat below the auriculars, and a slight flecking of white over the whole throat. In short, this example is exactly intermediate between ordinary *pectoralis* and highly developed *coyolcos*, so exactly combining the characters of the two that it might be looked upon as a bybrid between them.

* I have before me two adult males of *C. pectoralis*, in one (Nat. Mus. No. 28,058, Mirador) of which the wing measures only 3.75 inches—less by .20 than my smallest example of *C. coyolcos*—while in the other (Coll. G. N. Lawrence, City of Mexico), the wing measures 4.65, or .20 more than the longest wing in a series of six males of *C. graysoni*!

† The two male examples of *C. coyolcos* before me are intermediate in size between the two examples of *C. pectoralis* cited in the last foot-note, the wing of one (Nat. Mus. No. 58.928, Tehuantepec) measuring 4.00, and the wing of the other (Coll. G. N. Lawrence, Tehuantepec) 4.10. A female (Nat. Mus. 57,877), labeled "*Ortyx coyolcos* ♀," Tehuantepec, has a wing measuring 4.25!

Another specimen (Nat. Mus. No. 57,876), labeled "*Ortyx coyolcos* ♀ juv." (a very small example with the wing only 3.87, and evidently a young bird), has a cream-colored throat-patch and superciliary stripes, with the black forming a narrow collar, much as in *C. graysoni*, but with a few black feathers also in the throat-patch. The specimen is still partly in first or nestling plumage, and may not be full-grown.

While it would not be wise to generalize dogmatically from the scanty materials now at hand, it may be safe to say that they seem to indicate the instability and probable complete integradation of *C. coyolcos* and *C. pectoralis*, not only *inter se* but with *C. graysoni;* and, as already indicated, the latter is most likely to be found to intergrade with *C. ridgwayi* in the unexplored region at present separating the known habitats of the two. My own conclusions therefore coincide very closely with those of Mr. Ridgway, already published,* namely, that "*C. coyolcos* and *C. pectoralis* may be individual color phases of one species (*C. coyolcos*), and that *C. graysoni* and *C. ridgwayi* bear the same relation to one another."

* Forest and Stream, Vol. XXV, No. 25, Jan. 14, 1886, p. 484, foot-note.

ADDITIONS AND CORRECTIONS.

Page 209, line 2, for NICHOLAS read NICOLAS.

" 213, " 3, for NICHOLAS read NICOLAS.

" 225, under **[14.] Megalestris skua,** change lines two and three of this paragraph to read as follows: The only records are George's Banks, July, 1878 (*Brewer*, Bull. Nutt. Orn. Club, III, 1878, 188); Polluck Rip, off Cape Cod, Sept. 10, 1884 (*Goss*, Auk, I, 1884, 394).

" 240, line 12, for May 25 read May 20.

" 241, " 18 (under **[147*a*.] Œgialitis meloda circumcincta**) add: There are two specimens (male and female) of this variety in the Museum of the College of Princeton, taken by Mr. W. E. D. Scott, at Long Beach, Barnegat Bay, N. J., in April, 1877. In the same collection are also two specimens taken near Portland, Me., by Mr. N. C. Brown, respectively May 17, 1878 and May 2, 1880. None of these specimens appear to have been previously recorded.

" 241, line 26, for 151 read *151.

" 243, " 33, for Dec. 1869 read Jan. 1870, 568.

" 244, " 24, for 174 read *174.

" 244, " 27, for 175 read *175.

" 244, " 36, for VI read V.

" 246, " 1, for 1869 read 1870.

" 247, " 5, for 1869 read 1870.

" 250, " 30, for 233 read *233; and after "Marked as breeding by Dr. Emmons," add: and its nest was found in Cambridge in May, 1859 (*Brewer*, Hist. N. Am. Bds, I, 1874, 482). This nest is in the Museum of Comparative Zoölogy, Cambridge.

" 251, line 28, insert Mr. Purdie has recorded it as breeding at Saybrook, Conn. (Am. Nat., VII, 1873, 692).

" 256, line 4, insert, before the word *Woolsey*, *Purdie*, Am. Nat., VII, 1873, 692.

" 256, line 13, after the word see insert: *Purdie*, Am. Nat., VII, 1873, 692.

" 258, " 28, for 557 read 577.

" 268, " 13, for 259 read 289.

" 276, " 4, for Mr. F. Stephens read the British Museum.

POSTSCRIPT.—The distribution of the present number of the Bulletin has been delayed for six weeks, in consequence of unexpected and unavoidable delay in the printing of the plate which accompanies it. Separates of the first four articles were delivered to the authors, and to some extent by them distributed, during the first week of August.—J. A. A., Sept. 1, 1886.

nest E.T.Seton,del. et.lith

COLINUS RIDGWAYI. ½ nat.size.