

THE UNITED STATES RACES OF THE BOB-WHITE

BY JOHN W. ALDRICH

At the time of his death, E. W. Nelson was undertaking a complete revision of the genus *Colinus*. He had amassed a very large number of specimens on loan from virtually all of the American collections. He had supplemented this material with a considerable number of specimens which he induced various people to collect for him from key localities. His correspondence indicates that at the time of his death he was still attempting to assemble material from other localities. Beside copies of his voluminous correspondence relative to bob-whites, he left a number of penciled notes giving lists of measurements, descriptions of certain variations which he detected, and accounts of introductions and their results. These, together with a few identifications over his initials on specimen labels, indicate considerable progress in the understanding of the complex variation of this highly plastic species. At the time of his death he was obviously still in the process of amassing data and specimens, but no very definite opinions as to racial subdivisions were put on paper. The only opinions obviously differing from the current A. O. U. Check-List arrangement as indicated by his notes were the recognition of a distinct Great Plains form, and the elimination of the Key West race.

After Dr. Nelson's death, unfortunately, it was necessary to return to their respective owners without further study the specimens which had been amassed with such great pains. The return of specimens had been completed before my arrival on the scene, so I have had neither the advantage of information which these great series conveyed, nor of personal contact with Dr. Nelson, who undoubtedly had in his head a wealth of information about the variation of bob-whites which he never put on paper. However, when it became necessary for me to work out the status of the United States races of this bird, in connection with current work on the distribution of upland game birds, I did have the advantage of the fine collections which Dr. Nelson was largely instrumental in acquiring for the Fish and Wildlife Service (Biological Survey) collection of the United States National Museum, together with those notes which he left unfinished. In addition, I have examined critical specimens from Colorado in the Colorado Museum of Natural History, from Coahuila in the Chicago Natural History Museum, from Massachusetts in the Museum of Comparative Zoology at Harvard University, from Rhode Island in the Hathaway collection at Brown University, and from Louisiana in the Museum of Zoology at Louisiana State University. To the

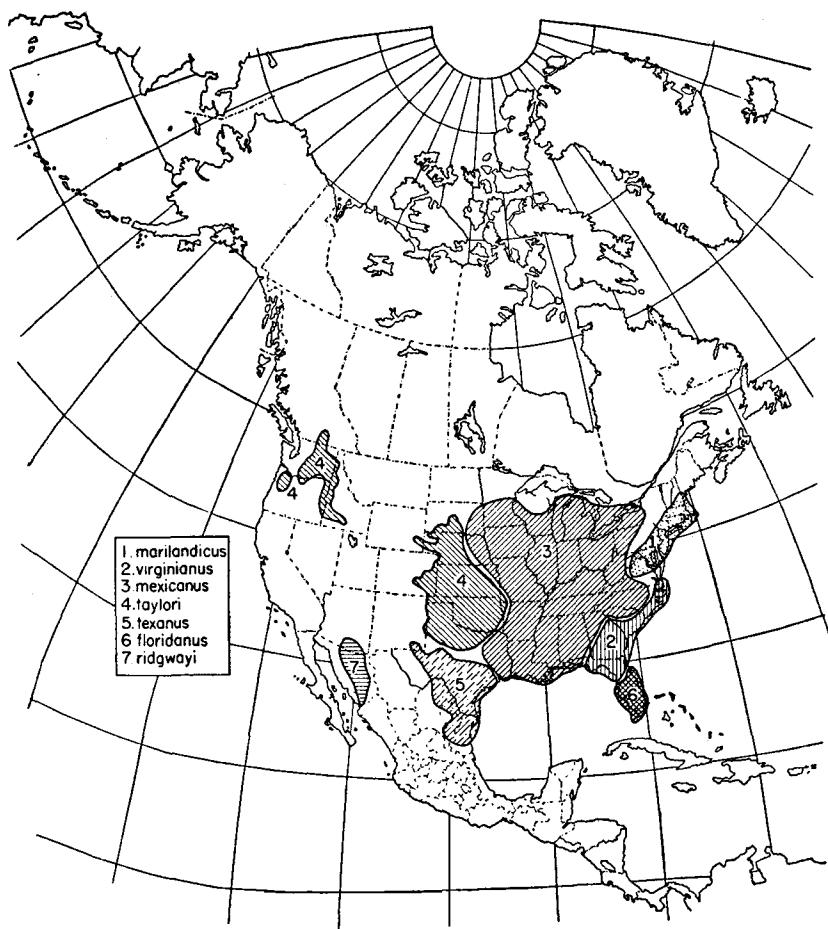
authorities of these institutions I am grateful for the opportunity to examine the specimens, and to Dr. Harry C. Oberholser for advice on the synonymy of the various races.

Taking into consideration the considerable individual variation amounting to rather distinct reddish and grayish phases in any locality, two definite geographic variation trends or clines are exhibited by bob-whites in the United States. First, there is a general trend toward a decrease in size in a southward direction, with the largest average size in the extreme northeastern corner of its range, and the smallest in southern Florida and southern Texas. No significant difference in the sizes of the two sexes is discernible. In color, the variation is from very reddish in the northeast to excessively grayish in the southwest, and from very dark in the southeast to pale on the extreme western edge of the range. These variations may be divided conveniently into six racial groups which are as follows:

1. A large, brightly colored, reddish bird in the northern Atlantic-Coast states.
2. A medium-sized, darker bird of the southern Atlantic-Coastal region.
3. A small, very dark bird in peninsular Florida.
4. A medium-sized to large, medium-toned, grayish bob-white, chiefly in the interior lowlands from the Great Lakes south to the Gulf Coast, west to the Plains, and east to the southern Piedmont of the Carolinas.
5. A large to medium-sized, pale race in the Great Plains region from Nebraska south to northern Texas.
6. A small, excessively gray race in southern Texas and northeastern México.

In addition, a seventh type occurred formerly in southeastern Arizona, and still occurs in Sonora. This form is more closely related to Mexican races than to those of the eastern United States. There is no present connection, either distributional or morphological, between the Arizona and Sonora form directly with the eastern birds. The numerous and highly variable Mexican populations might easily, however, form the connecting links.

Beside the broader geographic trends that are usually accepted as the criteria for racial recognition, there appears to be local variation of an ecotypical nature. Ridgway (1895: 16) and Nelson (ms.) in southeastern Illinois, noted a difference between specimens taken on the Wabash River flood plain and those from the surrounding high prairies, and Herbert L. Stoddard (*in litt.*, 1933), in southern Georgia,



TEXT-FIGURE 1.—United States races of *Colinus virginianus*.

mentioned differences between quail of the higher ridges and those of the "flatwoods." Milton B. Trautman (*in litt.*, 1946) noted color differences in Ohio bob-whites by which he could distinguish a "hill type, a woodland type, and a prairie type." He was able to correlate a general change in appearance of bob-white specimens, taken in different periods, with the widespread change from a forested condition to one of man-made prairies.

The great number of transplantations and introductions of bob-whites into various parts of the country have led some people to believe that it is hopeless to attempt to distinguish racial differences

in the United States populations. Such does not seem to be the case, and except where collecting was done immediately following introductions I detected little indication of racial admixture in the specimens examined. Furthermore, Herbert L. Stoddard (*in litt.*, 1945) can detect little or no difference in the bob-whites of central-southern Georgia, as the result of the release there of 5,000 individuals of *Colinus virginianus texanus* during a five-year period ending in 1931. Milton B. Trautman (ms., 1932) found no evidence in size, weight or coloration to indicate that the few "Mexican Quail" (*texanus*) importations into Ohio were successful, or had any lasting effect upon the native stock. In Pennsylvania, a very poor survival of *texanus* stock was indicated by Ernest E. Harwood (*in litt.*, 1933), who reported that of 5,000 banded Mexican quail liberated in that state in 1930, and 11,953 liberated in 1932, a scant two dozen bands were returned. Furthermore, very few birds shot there showed any trace of the imported Mexican quail characters. Probable reasons for this lack of survival of introduced foreign characters I have discussed in another paper (Aldrich, 1946).

Following is a summary of the seven races of the bob-white which occur in the United States, based on the more than 1,000 specimens examined:

***Colinus virginianus marilandicus* (Linnaeus)**

NEW ENGLAND BOB-WHITE

Tetrao marilandicus Linnaeus (1758: 161) "America," based on *Perdix Novae Angliae* (New England Partridge) Albin (1731: 26; pl. 28) ["New England"].

Tetrao marilandus Gmelin (1789: 761) "America ab Acadia ad Floridam," principally based on "La Perdix de la Nouvelle Angleterre" Brisson (1760: 229) and Buffon (1771: 447).

Ortyx castanea Gould (1842 [1843]: 182). Type locality unknown [= Boston, Massachusetts]. Type in British Museum.

Description.—Phillips (1915: 204–207) has summed up the distinctive characters of this "New England Partridge" of Albin's very well, and it is rather strange that its marked subspecific distinctness from typical *virginianus* has not been more generally appreciated. The chief reason for this presumably is that the name *virginianus* has not been applied to bob-whites of a sufficiently restricted population. The herein recommended restriction to the southern Atlantic-Coastal region makes possible the easy recognition of other races. The larger size of northern bob-whites in general, as distinct from southern representatives, has long been noticed by sportsmen and

ornithologists. Apparently this difference is, to a large extent, in the body bulk, since the measurable extremities of study skins show rather small, although definite, average differences. The wings of northeastern birds average only 4 mm. longer than those of examples from the southern Atlantic seaboard.

As Phillips (1915: 206) remarked, the color differences between the New England and southern Atlantic birds are more pronounced than the differences in skin measurements. *C. v. marilandicus* is a much lighter and more pinkish bird than typical *virginianus*, and the black markings are reduced to a minimum both above and below. It gives the appearance of being the brightest colored, as well as the largest, of all the races of bob-white.

The description of *Ortyx castanea* Gould agrees very closely with the rare erythristic phase which has been collected in Tennessee, central North Carolina, eastern Virginia, and Ohio. Conceivably this color phase could occur in any race, but the very large wing mentioned in the original description as 8½ inches (118.8 mm.) could hardly belong to any but a northern bird and at that early date (1843) New England was a very likely region where bob-whites of that size might have been obtained. Therefore, Boston, Massachusetts, is here suggested as a suitable type locality. This would make *castanea* Gould a synonym of *marilandicus* Linnaeus.

This remarkable color phase, which has become known as the "red quail," has been most extensively studied on the plantation of Hobart Ames, near Grand Junction, Tennessee, where six or seven in a covey of about 15 to 20 birds were first noted in the autumn of 1926 (Nelson, ms.). In this case it was of the subspecies *mexicanus* rather than *marilandicus*. Subsequent breeding experiments have shown that the color phase is genetically stable and the strain has been carried for several generations.

Two specimens of a similar red phase of *Colinus virginianus mexicanus* were shot by Mr. H. Mackay, January 24, 1933, on his game preserve in Jamestown Township, Guilford County, North Carolina. An adult female erythristic *C. v. marilandicus* was collected at Welcome, Southern King George County, Virginia, January 15, 1921, by H. T. Gouldman. All of these specimens are in the U. S. National Museum. The first specimen of "red quail" of which we have any record, beside the type specimen of *Ortyx castanea* Gould (1843), is an adult male of *C. v. mexicanus*, now mounted in the Cuvier Press Club collection, Cincinnati Society of Natural History, collected by M. W. Greenwood at Bethel, Clermont County, Ohio, in 1874.

Measurements.—Adult male (27 specimens from Connecticut, Massachusetts, eastern New York, and Rhode Island): wing 107–119 mm. (av., 113.4); tail, 57–71 (63.2); culmen, 13.5–15 (14.4); tarsus, 30–35 (33.3).

Distribution.—Permanent resident north to southwestern Maine, central New Hampshire, and southern Vermont; west to central-eastern New York, central-southern Pennsylvania, and central Virginia; south to south-central Virginia and southern Maryland; east to the Atlantic seacoast from Delaware to southwestern Maine.

Localities of Specimens Examined.—CONNECTICUT: Guilford, Norwich; DISTRICT OF COLUMBIA: Washington; FLORIDA: Leon County¹; MARYLAND: Baltimore, Clinton, Falston, Laurel, Marshall Hall, Seward; MASSACHUSETTS: Belmont, Bridgewater, Cambridge, Chatham, Dighton, Holden, Lynn, Middleboro, Norton, Plainville, Taunton, Tisbury, Wareham, Wenham, West Newton; NEW YORK: Hastings; NORTH CAROLINA: Guilford County², Pinehurst², Pittsboro²; PENNSYLVANIA: Carlisle, Edenville, McConnellsburg, South Creek Township (Bradford County²); RHODE ISLAND: Kingston, Lake Worden, West Greenwich; VIRGINIA: Arlington, Ashland, Ballston, Campbell County, Essex County, Fairfax County, Falls Church, Nelson County, Prince George County², and near Washington, D. C.

***Colinus virginianus virginianus* (Linnaeus)**

EASTERN BOB-WHITE

Tetrao virginianus Linnaeus (1758: 161) based on *Perdix silvestris virginiana*, American Partridge (Catesby, 1748: 12). In America [= Charleston, South Carolina].

Perdix borealis Temminck (1815: 436–735) based on *Perdix virginiana marilanda, mexicana et Coyalcos* of Latham (1790: 650, sp. 24, 25, 31, 34). A composite of several forms, intended to comprise the entire species as known at that date.

T[etrao] minor s. coturnix Bartram (1791: 290). Non-binomial.

Tetrao minor "Bartram" Baird (1858: 640). In synonymy of *Ortyx virginianus*.

The Committee on Nomenclature of the American Ornithologists' Union (1931: 88) has rightly restricted the type locality of *Tetrao virginianus* Linnaeus to South Carolina, since Catesby (1731) in his preface to Volume 1 gives no indication that during his seven-year stay in Virginia he had any idea of preparing a work on natural his-

¹ Either introduced example of this race or atypical example of native race.

² Intergrade.

tory. The further restriction of the type locality of this form to Charleston, South Carolina, where Catesby is known to have done much of his bird work in preparation for his publication, seems justified in view of the occurrence of two races of bob-white in South Carolina. The bob-white was and still is common on the coastal lowlands of South Carolina, where Catesby spent a year studying plants and animals, and where he had a better opportunity to become familiar with the bob-white than during his shorter trips to other regions. Catesby's use of the name *virginiana* for this bird must have been due to his memory of having first seen it during his earlier visit to Virginia.

Description.—This race, which in typical form is restricted almost entirely to the coastal plain of the southern Atlantic seaboard, is a relatively dark colored bob-white, although not nearly so blackish, either above or below, as *floridanus*. The black areas are noticeably more numerous and the brown areas darker and duller (less pinkish) than in *marilandicus*. It also averages somewhat smaller than that race.

Measurements.—Adult male (36 specimens from southeastern South Carolina, southern Georgia and northern Florida): wing, 102–115 (109.4); tail, 58–65 (60.2); culmen, 14–16 (14.7); tarsus, 31–33 (31.8). Adult female (14 specimens from southeastern South Carolina, southeastern Georgia and northern Florida): wing, 103–112 (107.5); tail, 57.5–65.5 (61.1); culmen, 13.5–14.5 (13.9); tarsus, 30–33 (31.5).

Distribution.—North to extreme southeastern Virginia; west probably to the junction of the Piedmont and the coastal plain in the Carolinas, north-central Georgia, southeastern Alabama, and central-northern Florida; south to northwestern and north-central (Palatka and Lake Miona, Sumter County) and northeastern Florida; east to the Atlantic Coast from northeastern Florida to southeastern Virginia.

Localities of Specimens Examined.—ALABAMA: Abbeville; ARKANSAS: Delight;¹ FLORIDA: Arran, Camp Parker (Jefferson County), Fanlew (Jefferson County), Fort Gadsden, Gainesville, Jacksonville, Lower Jefferson County, Lake Harney,² Lake Miona (Sumter County), Leon County (Forshala Plantation), Mariana, Miller, New River (mouth), Oclockonee River (southern Leon County), Oxford (3 mi. S. E.), Palatka, Panacea, St. Marks, Tallahassee, Wakulla, Walker Springs (Jefferson County), GEORGIA: Athens, Beachton, Chessers Island (Charlton County), Grady County, Liberty County, McIntosh County, St. Marys River (Camden County), Sapelo Island, Savannah, Thomas County; HAITI: Furcy;¹ IDAHO: Nampa;¹ JAMAICA: Spanishtown;¹

¹ Either introduced example of this race or atypical example of native race.

² Intergrade.

LOUISIANA: Avery Island;¹ PENNSYLVANIA: Ayr Township (Fulton County),¹ Newcastle;¹ RHODE ISLAND: Burrillville;¹ SOUTH CAROLINA: Christ Church Parish, Mount Pleasant, Pineville, St. Helena Island, Wedgefield; VIRGINIA: Suffolk; WASHINGTON: Asotin County (Grand Ronde River),¹ Goldendale;¹ WEST VIRGINIA: Huntington.¹

***Colinus virginianus floridanus* (Coues)**

FLORIDA BOB-WHITE

Ortyx virginianus var. *floridanus* Coues (1872: 273). Enterprise, Volusia County, Florida. Type in Museum of Comparative Zoölogy, Cambridge, Massachusetts.

Colinus bahamensis Maynard (1898 [1903]: 33). Nassau, Island of New Providence, Bahama Islands. Cotypes in Museum of Comparative Zoölogy, Cambridge, Massachusetts.

Colinus virginianus insularis Howe (1904: 168). Key West, Florida. Type in Museum of Comparative Zoölogy, Cambridge, Massachusetts.

Description.—The bob-white of the Florida Peninsula is very small and the darkest of all the United States races. It is very heavily marked with black, particularly on the under parts. Upper parts usually extensively gray, which color to a large extent replaces the reddishness of other eastern races.

The unique type of *C. v. insularis* is placed here since it does not seem to be outside the possible limits of individual variation of this race. It would seem that the maintenance of a distinct race of bob-white on the basis of one specimen would be unthinkable. Individual variations are much too great in all races. E. W. Nelson indicated in his unpublished notes that he not only held the same opinion but even doubted that bob-whites ever occurred naturally at Key West.

Measurements.—Adult male (56 specimens from southern Florida): wing, 97–112 (104.7); tail, 50–65 (58.8); culmen, 13–16 (14.5); tarsus, 30–33 (30.6).

Distribution.—Permanent resident in the lower three- to four-fifths of peninsular Florida north to Clearwater, Welaka, and Anastasia Island; formerly in the keys. Introduced in the Bahama Islands.

Localities of Specimens Examined.—FLORIDA: Anastasia Island, Arcadia, Big Lake George, Blue Cypress Lake, Braden River (Manatee County), Canaveral, Catfish Creek (Polk County), Charlotte Harbor, Clearwater, Corbetts, Fort Bassenger, Fort Lauderdale, Immokalee, Kenansville, Kissimmee, Kissimmee River, Lake Arbuckle, Lake Harney, Lake Kissimmee, Lake Worth, Leon County (northern),¹

¹ Either introduced example of this race or atypical example of native race.

Miakka Lake, Miami, Miami River, Orange Hammock, Punta Gorda, Ritta, Rock Lake, Taylor's Creek, Welaka, Wilson.

***Colinus virginianus mexicanus* (Linnaeus)**

INTERIOR BOB-WHITE

Tetrao mexicanus Linnaeus (1766: 277). "Habitat in Mexico, Ludoviciana." Principally based on Brisson (1760: 258, pl. 22, fig. 2). Type from Louisiana, in Réaumur collection (Hellmayr and Conover, 1942: 239).

Description.—Over the greater part of eastern United States east of the Great Plains, excepting those populations already mentioned, the bob-whites are of a medium shade with a grayish wash, grayer than *marilandicus* and more grayish and paler than *virginianus*. Birds of the Gulf Coast average slightly smaller than those from the northern states, but the average difference of only 2 mm. in the wing is hardly significant as a subspecific character. The wings of 27 male specimens from southern Alabama, Louisiana, and eastern Texas measure 107–115 mm. (av., 110.5), and wings of 38 males from South Dakota, Minnesota, Wisconsin, Iowa, Illinois, Michigan, and Ohio measure 109–119 (112.5). There is considerable individual variation within this race, both in color and size, but nothing that can be considered as of sufficiently consistent correlation to warrant further racial splitting. It seems best to consider this whole great population as representing one subspecies, for which a Linnaean name, *mexicanus*, is available, with type locality Louisiana.

Ridgway (1895: 16) mentions a population of small, dark-colored quail that he found in the Wabash River bottoms which he and Nelson originally concurred in calling *floridanus*, but which they later decided was too rusty in color for that race. Ridgway indicated that if these birds were not so circumscribed in their distribution he would consider them a subspecies distinct from the quail of the surrounding upland prairies. Nelson (ms.) mentions the more arboreal habitat of these river-bottom birds as well as their small size and dark color. The wing measurements given of three males of the river-bottom type from the vicinity of Mount Carmel, Illinois, (110, 112, 110) certainly do not indicate small size. On the other hand they seem to be quite typical of *mexicanus*. Some of the Ridgway specimens from southeastern Illinois now in the U. S. National Museum certainly are darker than the average *mexicanus*. In fact they resemble typical *virginianus* very closely in this respect. It might be added that specimens in the National Museum from Inde-

pendence, Missouri, Delight, Arkansas, and Hickman County, Kentucky, are of the same type. Whether or not they were taken in bottomlands is, however, not known. A more thorough study should be made in the field of differences between bob-whites of the extensive flood plain of the Mississippi River and its tributaries and those of the prairies of surrounding regions.

Measurements.—Adult male (67 males from South Dakota, Minnesota, Wisconsin, Michigan, Ohio, Indiana, Illinois, Tennessee, Louisiana, and Alabama): wing, 106–119 (112.1); tail, 49–71 (62.2); culmen, 12.5–15.5 (14.4); tarsus, 30–36 (32.7).

Distribution.—North to north-central New York, southeastern Ontario, northern Michigan, east-central and northwestern Wisconsin, central Minnesota, and east-central South Dakota; west to central-eastern South Dakota, east-central Nebraska, northeastern Kansas, central-northern and southwestern Arkansas, northeast-central and southeastern Texas; south to the Gulf Coast from southeastern Texas to northwestern Florida; east to southeastern Alabama, central South Carolina, east-central North Carolina, west-central West Virginia, central-northern Pennsylvania, and north-central New York. It should be realized that the northern limit of the range of this race, as well as of *marilandicus*, varies with the weather conditions, receding considerably to the southward after winters of heavy snowfall. The northern limits as here given probably should be considered as representing maximum range during periods of optimum weather conditions.

Localities of Specimens Examined.—ALABAMA: Alberta, Bon Secour, Castlebury, Dothan, Fairhope, Gastonburg, Jackson, Orange Beach, Sand Mountain (near Dutton), Selma (30 mi. S. W.); ARKANSAS: Delight; DISTRICT OF COLUMBIA: Washington;¹ FLORIDA: Leon County,² St. Marks;² GEORGIA: Beachton, Thomas County;² IDAHO: Nampa;¹ ILLINOIS: Carbondale, Cook County, Mount Carmel, Olney (Richland County), Parkersburg, Springfield, Sugar Creek Prairie, Tunnel Hill; INDIANA: Brown County, Green County, Jackson County, Jay County, Lawrence County, Wheatland; KANSAS: Lawrence; KENTUCKY: Ashland, Bedford, Hickman County, Priorsburg (Graves County), Shelbyville (Shelby County); LOUISIANA: Amite, Avery Island, Baton Rouge, Clarks, Creole (Cameron Parish), Foster, Houma, Lafayette, Plaquemine Point, Prairie Mer Rouge, Pride, University, Willow Island; MARYLAND: Falston,¹ Laurel,¹ Seward,¹ Takoma Park;¹ MASSACHUSETTS: Mansfield,¹ Middleboro,¹ Wenham;¹ MICHIGAN: Auburn Township, Beaver Township (Bay County), Brown Township, Kala-

¹ Either introduced example of this race or atypical example of native race.

² Intergrade.

mazoo, Portage Lake (Livingston County), Ross Township (Kalamazoo County), Washtenaw County, Wayne County; MINNESOTA: Fort Snelling, Northfield, Rushford; MISSISSIPPI: Rosedale, Saucier; MISSOURI: Charleston, Independence, Stokley; NEBRASKA: Neligh; NEW YORK: Hastings; NORTH CAROLINA: Asheville, Deep River Township (Guilford County), Friendship Township (Guilford County), Gibsonville, Jameston Township (Guilford County), Pittsboro, Waynesville, Wilson; OHIO: Circleville, Madison Township (Franklin County), Medina County, Norwich Township (Franklin County), Paris Township (Union County), Union Township (Clermont County); OKLAHOMA: Savanna,¹ Hartshorne;¹ ONTARIO: Sarnia; PENNSYLVANIA: Ayr Township (Fulton County), Newcastle, South Creek Township (Bradford County); SOUTH CAROLINA: Eastover (Richland County), Hiltonhead, Kershaw County, Spartanburg; SOUTH DAKOTA: Vermilion; TENNESSEE: Danville, Germantown, Grand Junction, Shady Valley (Johnson County); TEXAS: Dallas,¹ Gainesville, Joaquin,¹ Long Lake (Anderson County), Sour Lake, Tarkington; VIRGINIA: Ashland;¹ WEST VIRGINIA: Big Bend (Calhoun County), Elkins, Huntington; WISCONSIN: Columbia County, Coon Valley, Potosi, Sumner, Trempealeau.

Specimens of the pen-reared bob-white stock used for experimental purposes on the Patuxent Wildlife Research Refuge, Bowie, Maryland, are of this race. This stock is composed of birds obtained from dealers in Virginia and Pennsylvania and indicates the extent to which *mexicanus* racial characteristics are probably being introduced into all parts of the country through restocking enterprises.

***Colinus virginianus taylori* Lincoln**

PLAINS BOB-WHITE

Colinus virginianus taylori Lincoln (1915: 103). Laird, Yuma County, Colorado. Type in Colorado Museum of Natural History, Denver.

Description.—Colonel Goss (1891: 222–223) was the first author to recognize the existence of a pale form of bob-white in the Great Plains region, as indicated by his allocation of two specimens taken by Elliot Coues on the Republican River in northwestern Kansas in 1881 as *texanus*. The Great Plains population of bob-whites is larger and less heavily marked with black above and below than *texanus*, and is paler than *mexicanus*. In size it averages as large as *mexicanus*. The name *taylori* was originally proposed for a relatively small portion of this population occurring in Colorado. Nevertheless it seems applicable to the Great Plains birds in general.

¹ Intergrade.

Measurements.—Adult male (15 specimens from eastern Colorado, western Kansas and northwestern Texas): wing, 105–117 (112.4); tail, 56–68 (61.9); culmen, 13–15 (14.1); tarsus, 30–33 (31.7).

Distribution.—Confined to the brushy borders of the larger streams flowing across the Great Plains north to central South Dakota and southeastern Wyoming; west to north-central and southeast-central Colorado, and central-eastern New Mexico; south to central-eastern New Mexico, north-central Texas, and southeastern Oklahoma; east to northwestern Arkansas, southwestern Missouri, central-southern and central-northern Nebraska, and central South Dakota. Established after transplantation in eastern Washington, eastern and northwestern Oregon, and southwestern Idaho. Most of the examples of this well-established introduced population are typical *taylori*. A few resemble other races more closely, indicating that other racial stock was introduced.

E. W. Nelson (ms.) remarks that: "Sufficient evidence exists to prove that Goss was in error as to his theory that bobwhites on the Cimarron River (western Oklahoma) were the Texas form which had reached that point by following the old military trail north through the Indian Territory (now Oklahoma) for the purpose of picking up scattered grain at camping and other feeding places, and that this species was absent in western Kansas until the advance of farming settlements brought them from the eastern part of the state. The facts appear to be that the pale bobwhite of the arid plains, *taylori*, existed in rather limited numbers along the main river valleys flowing eastward from the Rocky Mountains through Colorado and New Mexico and in western Kansas, Oklahoma, and northwestern Texas. The proof of this is found in the records of the early explorers. Apparently in early days *C. v. taylori* had a broken distribution in river valleys crossing a broad arid belt lying on both sides of the 100th Meridian of Longitude, nowhere reaching the eastern base of the Rocky Mountains. Abert's observation was that the upper limit of bobwhites on the Republican River in New Mexico was the end of the wild plum thickets which gave the birds excellent shelter."

Localities of Specimens Examined.—ARKANSAS: Fayetteville; COLORADO: Baca County, Denver, Fowler, Holly, Powers (Bent County), Regnier (Baca County), Wray (Yuma County); IDAHO: Boise, Nampa, Star; IOWA: Iowa City; KANSAS: Belle Plains, Cairo, Republican Fork (near Fort Riley); LOUISIANA: Avery Island;¹ MARYLAND: Falston;¹ MISSOURI: Golden City; NEBRASKA: Valentine; OKLAHOMA: Camp

¹ Either introduced example of this race or atypical example of native race.

Supply, Custer County, Dougherty, Fort Cobb, Fort Gibson, Fort Reno, Hartshorne, Luther, Red Oak, Sallisaw, Savanna, Town Point, Tulsa, Washita County, Wichita Mountains; OREGON: Nyassa, Ontario (Wood Ranch); PENNSYLVANIA: Carlisle;¹ TEXAS: Canadian River, Cisco,² Gainesville, Joaquin, Lipscomb, Mobeetie; WASHINGTON: Kiona, Odessa, Oroville, Prosser; WISCONSIN: Columbia County.¹

***Colinus virginianus texanus* (Lawrence)**

TEXAS BOB-WHITE

Ortyx texanus Lawrence (1853: 1). Near Ringgold Barracks, Texas. Type in American Museum of Natural History, New York, N. Y.

Description.—The Texas Bob-white is small, pale, excessively grayish above and relatively heavily barred below. Despite its pallor it is a relatively heavily marked bird, having a rather more variegated appearance than any other race except *floridanus*. This is chiefly because the back patch, which is relatively plain-colored in most eastern birds, in *texanus* is flecked and barred with gray and black to a high degree. Furthermore, the whiteness of the light markings and edgings of the wing feathers add to the unusually variegated appearance. This characteristic rather than the grayishness or pallor is the best indicator of *texanus* blood in mixed stock.

Measurements.—Adult male (42 specimens from southern and central-western Texas, northern Coahuila, and northern Tamaulipas): wing, 102–111 (107.6); tail, 53–67 (60.7); culmen, 13.5–15.5 (14.6); tarsus, 30–33 (31.7).

Distribution.—North to east-central Texas and southeastern New Mexico; west to southeastern New Mexico, west-central Texas, north-central Coahuila, and south-central Nuevo León; south to central and central-eastern Tamaulipas; east to the Gulf Coast from central-eastern Tamaulipas north to southeastern Texas. A specimen collected by Captain Pope on May 15, 1855, on the Pecos River, west Texas near latitude 32° N., is not typical of *texanus*, but by the presence of much more rufous on the upper parts and flanks is plainly an intergrade toward *taylori* (Nelson ms.).

The Texas Bob-white, or "Mexican quail," as it is frequently called, has been transplanted extensively into many parts of the United States. However, all evidence seems to indicate that it does not do well outside of its normal range and, although it may interbreed with the native bob-whites in the region where it is introduced, its characters are completely lost in a relatively few years. As far as we know there is no well-established population of Texas Bob-whites resulting from

transplantations into regions where the race did not at one time occur naturally.

Localities of Specimens Examined.—COAHUILA: Muzquiz, Sabinas; FLORIDA: Leon County (Forshala Plantation);¹ GEORGIA: Beachton;¹ KENTUCKY: Burlington;¹ MARYLAND: Seward;¹ NUEVO LEÓN: Montemorelos, Pesquera Grande; PENNSYLVANIA: Carlisle;¹ TAMAULIPAS: Bagdad, Matamoros, Mier, Soto la Marina; TEXAS: Bee County, Bexar County, Brownsville, Corpus Christi, Del Rio, Devils River (Edwards Plateau), Eagle Pass, Fort Clark, Fort Stevens, Giddings, Hempstead, Laredo, Lomita, Lozier, Luling, McLennan County, Padre Island, Pecos River, Pecos River (mouth), Reynosa, Richmond, Rio Grande City, Rock Spring (Edwards Plateau), San Antonio, Santa Maria, Seguin.

***Colinus virginianus ridgwayi* Brewster**

MASKED BOB-WHITE

Colinus ridgwayi Brewster (1885: 199). Eighteen miles southwest of Sasabe, Sonora, México. Type in British Museum.

Description.—Appears more like the Mexican races and is probably more closely related to them than to bob-whites of other parts of the United States. Males have the black throat-patch characteristic of the Pacific-Coastal forms of southern México. Strangely enough, both males and females show closer resemblance to *C. v. insignis* of the Pacific-Coastal region of Chiapas and western Guatemala, than to geographically much closer races in México and the United States. From *insignis* this form differs only in slightly larger size and paler coloration.

Measurements.—Adult male (7 specimens from northern Sonora and Arizona): wing, 103–111 (107.9); tail, 61–66.5 (62.8); culmen, 13–13.5 (13.1); tarsus, 27–29.5 (28.6).

Distribution.—Formerly a permanent resident from southeastern and central-southern Arizona, south to southern Sonora. Now extirpated from parts of its former range, including that portion north of the United States-México border.

Localities of Specimens Examined.—ARIZONA; SONORA: Bacuachi, Campos [= Cumpas], Los Arenas.

¹ Either introduced example of this race or atypical example of native race.

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Fish and Wildlife Service

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SPECIES ASSOCIATION IN WINTER GROUPS

BY LEONARD WING

In the course of winter bird trips, particularly those taken in the mountains of the West, I have been attracted by the relationship among birds of several species that flock together in winter. My interest has been aroused especially by multispecies groups observed on Christmas-census trips in the conifers adorning a ridge in Latah County, Idaho, variously known as Moscow Mountains and Thatuna Hills. These impressions have been strengthened further by some observations made during field work last spring (1945) in the Grand Ronde River country along the eastern side of the Blue Mountains of Washington and Oregon.

Among the most intriguing of all winter birds are the forest dwellers that associate together in winter: Black-capped Chickadee, Mountain Chickadee, Chestnut-backed Chickadee, Red-breasted Nuthatch, White-breasted Nuthatch, Pygmy Nuthatch, Brown Creeper, White-headed Woodpecker, and Downy Woodpecker. I am not sure whether the White-headed Woodpecker, Downy Woodpecker, and Brown Creeper really form a part of the company that works the woods in concert. They are often found with it, but even so, they do not give the appearance of being wholly a part of the company. Hairy Woodpeckers, too, occasionally associate with it, as do our Golden-crowned Kinglets and Arctic Three-toed Woodpeckers.

One can hardly help wondering at the seeming constancy with which a mixed assemblage from this group feeds and moves about as a unit. I have no exact data to support the belief, but it seems to me that the company sticks together day after day. I rather feel that all