numerous sloughs. Over its surface are scattered shells, some fossil, but many recent. The salt is strong in the soil, and the vegetation low and scanty. It is a region of fierce and long continued winds which tear down and rebuild veritable mountains of sand. I have named this district after its principal central settlement.

As but a small trangular corner of the San Ignacio District enters Baja California del Norte on the mainland, what concerns us chiefly is the geographical picture when this portion of the earth's surface was under the waters of the Pacific Ocean. I have outlined on the map a series of the probable islands. At that time this district was an archipelago which included Cedros, the Benitos, and perhaps a part of Natividad. It was also the channel between the ocean and the gulf that greatly reduced the size of Baja California del Sud and made of it one or more great islands—a condition which would seem to explain nearly all the peculiarities of faunal distribution between the two territories.

One of the most interesting fields now open to ornithological research, and one which I hope soon to explore, is comprised in these ancient islands. How far did they develop endemic bird and mammal life and how far did they retain such developments? Especially how complete, during the centuries, has been the isolation and how far has life crossed the great salt flats? If there has been an interchange of influence, from which side did it come?

San Diego, California, June 6, 1926.

THE CALIFORNIA FORMS OF *AGELAIUS PHOENICEUS* (LINNAEUS)

WITH FIVE ILLUSTRATIONS

By A. J. VAN ROSSEM

THE present paper, the first part of a proposed general revision of the forms of *Agelaius phoeniceus,* deals primarily with the distribution of the various Californian races during the breeding season. Winter ranges are touched upon only casually; for the comparative scarcity of winter record stations, particularly in the north, precludes the possibility of satisfactorily outlining the winter distribution of the subspecies even in the restricted area which is under survey at the present time.

A word of explanation regarding the individuals which are here classed as breeding birds is in order. In most cases the term is applied to birds known either to be actually nesting in a certain area, or to be about to do so. In addition, a certain small proportion of males taken prior to the breeding season is included in this category. The males of most and probably all of the western forms of *phoeniceus* select and mount guard over the future nesting sites, while the females are still drifting about the country in irresponsible flocks. These "established" males have been used in all cases where the experience and discrimination of the collector has been sufficient to give value to his opinion. Another and still smaller class includes the birds of both sexes which unequivocally represent the resident form and which are present during the proper season in the breeding metropolis of the race, but which through one cause or another chance to be non-breeders. These are principally one-year-old birds, many of which fail to breed at this age. In some cases these birds have been used; in others they have been ignored, as circumstances dictated. A considerable number of the specimens examined have no indication on their labels as to whether or not they were breeding.

This omission, while of no great moment in the case of specimens taken well along in the nesting season, has at times rendered the segregation of local series into "migrant" and "resident" lots a matter of some difficulty.

The seven races of red-winged blackbirds, which breed in California, are evidently derived from three distinct strains. The first of these now occupies a wide expanse of territory ranging from the lower Rio Grande Valley west and north through the

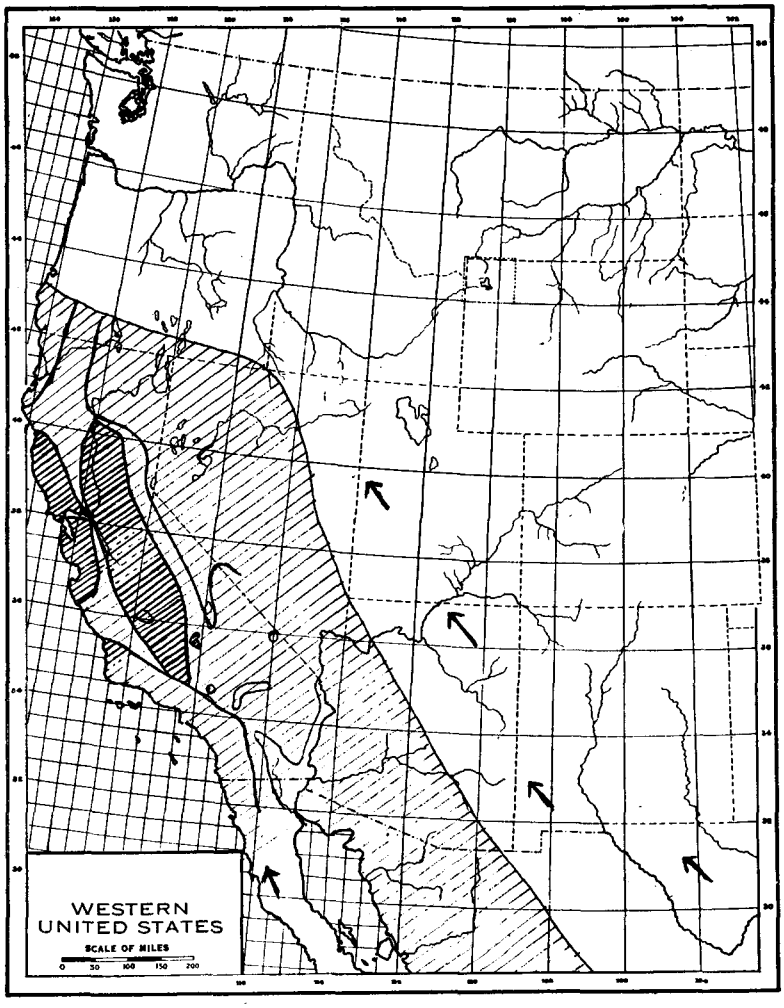


Fig. 72. Approximate range of the *"gubernator"* stock in the western United States before the invasion of the slender-billed *"phoeniceus"* strain from the southeast and the thick-billed *"phoeniceus"* strain [from the south?]. In the heavily shaded areas *"gubernator"* influence is still dominant.

Great Basin to the humid coast of Oregon and Washington. It is characterized mainly by a slender type of bill, the females are streaked and the middle wing coverts of the adult males are clear buff on their exposed portions. This stock has now become differentiated into four geographical races, namely: *megapotamus* of the Rio

Grande valley, *sonoriensis* of the Lower Sonoran deserts of Arizona, California and northwestern Mexico, *nevadensis* of the Great Basin region in general, and *caurinus* of the humid northwest coast of Oregon and Washington. In matters of coloration, this strain follows the usual trend of plastic species in western North America. In other words, the richest colored form is found in the humid northwest coast belt, while the palest form occupies a region of extreme aridity. Fringes of the last three of the races named above occur in the eastern and northern parts of California.

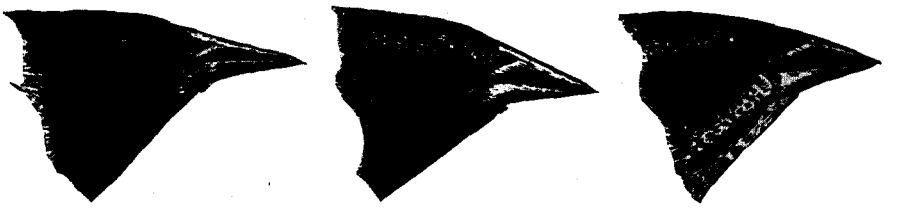
The second strain is characterized by a heavy bill, and, like the first, the females are streaked and the males are of the buff-winged type. It is represented in southwestern California by *neutralis,* but its influence extends well into central California. The data seem to point to the probability that this stock originated somewhere in southern Mexico and that one branch has worked north and developed into the *fortis* type, culminating in *arctolegus* in the extreme north, while another offshoot has pressed northwestward into California to become *neutralis.* The red-wings of Nayarit (Tepic) are of this general thick-billed type and they probably represent, if not the original stock, at least a link in the parent chain from which this thick-billed strain was derived. The suggested method of entry into California is frankly speculative. To begin with, there is no unbroken chain of races, such as exists in *megapotamus, sonoriensis, nevadensis,* and *caurinus,* reflecting the development and spread of the slender-billed group. However this may be, there is evidently a close relationship between *nyaritensis*[1], *fortis, arctolegus,* and *neutralis,* which represent variations from a common thick-billed, buff-winged stock.

The third strain is typified by races in which the females are uniformly dark rather than streaked and in which the middle wing coverts of the males are black instead of buff. It is probable that this was the type which originally occupied western North America, from the southern end of the Mexican plateau north at least to southern Oregon and east in the United States at least to central Nevada and central Arizona. In times past, its northern limit was probably regulated by climatic conditions just as is the northern limit of *arctolegus* today. Since the invasion of the slender-billed stock from the southeast and the thick-billed stock from the south, the primitive dark-colored race has been more or less completely eliminated by absorption. This replacement is most complete, of course, along the first line of contact, and in consequence only traces of *"gubernator"* influence are discernible today along this presumptive line. Proceeding westward, evidences of mixed ancestry become more and more apparent, and in portions of central California the old stock is still dominant. This mixture of the original inhabitants with two invading stocks has resulted in a confusion of characters almost without parallel.

Age must be taken into consideration in making determinations. The variation of the shape of the bill with age is of particular importance. It is short and blocky in the juvenile and becomes more attenuated as the birds grow older; thus one-year old birds, particularly among the males, have stubbier bills than adults. For example, one-year old males of *nevadensis* have bills not unlike adults of *neutralis,* although there is little likelihood of confusing the two forms, provided birds of similar age are compared. One-year-old birds of both sexes average a good deal smaller than older specimens. The one-year-old male is usually easily distinguished by impure red lesser coverts, by variegated and often extensively black middle coverts, by a greater or lesser amount of rusty or grayish tipping of the feathers in general, and by a brownish, lusterless tone of plumage. Failure to appreciate certain of these differences has led to some of the many erroneous extralimital records of *"gubernator".* The age of

[1] Proc. Biol. Soc. Wash., vol. 38, 1925, pp. 131-132.

females is not so well indicated; as a rule, the lesser coverts in this sex are tipped with olive in the young, and with dull red in the adults. It is probable that the lesser coverts become increasingly brilliant with age. At any rate, in most of the Californian forms, the juvenile female has been found to molt into an olive-tipped lesser covert, and birds with this type of covert have consequently been classed as one-year-olds.



a *b* *c*

Fig. 73. Age variation in the bills of males of *Agelaius phoeniceus nevadensis*
a, adult (J-1467) *b*, 1 year old (K-178) *c*, juvenile (E-203)
Specimens in collection of Donald R. Dickey

These birds also have a less durable plumage and the streaking is not as sharp and clear as in the adult. Females of the slender-billed group average more brilliant on the shoulders than is usual, and first fall females often have a certain amount of red on the lesser coverts.

My opinion as to which characters will prove most reliable in identifying the Californian races is covered in the following synopsis.

Agelaius phoeniceus neutralis Ridgway
San Diego Red-winged Blackbird

Agelaius phoeniceus neutralis Ridgway, Proc. Wash. Acad. Sci., vol. 3, 1901, p. 153. (Jacumba, San Diego County, California.)

Diagnosis.—Similar to *Agelaius phoeniceus californicus* in size and shape of bill. Males with exposed portions of middle wing coverts more extensively buffy, often unmarked with black. Females more streaked (less blackish below) and with coloration paler throughout. Differs from *Agelaius phoeniceus nevadensis* in heavier bill in both sexes, and in broader streaking on underparts of the females.

Measurements of 13 adult breeding males, San Diego and Orange counties, California:

Wing	Tail	Culmen from base	Depth at[1] base	Tarsus	Middle toe minus claw
121.0-130.5	86.5-98.5	22.3-24.1	11.4-13.3	28.4-31.2	21.0-23.6
(125.5)	(92.0)	(23.2)	(12.5)	(30.1)	(21.9)

Measurements of 5 breeding females from San Diego and Orange counties, California:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
100.5-105.5	72.5-77.0	19.3-20.5	10.6-11.2	25.5-26.6	18.5-19.5
(103.7)	(74.3)	(19.8)	(11.0)	(26.2)	(18.9)

[1] Depth at base, as here used, is always the distance from the posterior lower corner of mandible to the highest point of the culmen.

Range.—Pacific drainage from Sierra Juarez, Lower California, to west-central San Luis Obispo County, California.

Remarks.—*Neutralis* is a common resident in all suitable localities in the San Diegan Faunal Area. Along the southeastern boundary of its range there is, because of environmental conditions, no intergradation with *sonoriensis*. Intergradation may occur in the San Gorgonio Pass region of Riverside County, but there is no direct proof of this possibility. The easternmost station for *neutralis* in this region is Redlands, while a tongue of *sonoriensis* extends up into Coachella Valley on the desert

side. Between these two points there is extensive cultivation which will probably, sooner or later, bring the two races into contact. Some form of red-wing had a small colony in a swampy area in Chino Cañon, near Palm Springs, in 1922. A special trip to investigate this colony was made in 1923, but no red-wings were found there that year. Several old nests, however, testified to their former presence. These birds may possibly have formed an outpost of *neutralis,* for several other San Diegan forms have gained a foothold there, among them *Melospiza melodia cooperi, Pipilo fuscus crissalis, Psaltriparus minimus minimus, Chamaea fasciata henshawi* and *Dryobates*

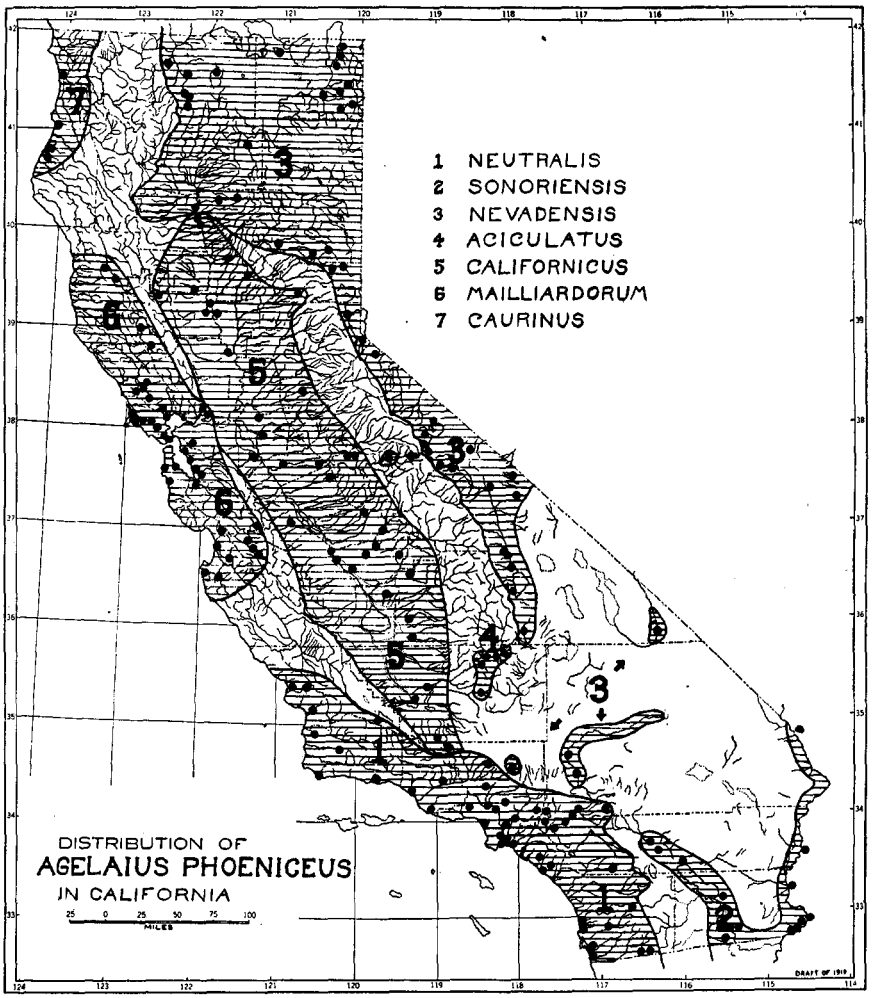


Fig. 74. DISTRIBUTION OF THE RED-WINGED BLACKBIRDS IN CALIFORNIA.

nuttalli. However, until breeding red-wings are collected from that or other nearby points there is no exception to the statement that *neutralis* is confined during the breeding season to the coastal slope. The breeding series from the San Bernardino district averages somewhat longer in bill than typical *neutralis.* This may indicate a tendency toward *sonoriensis* of the Colorado Desert or toward *nevadensis* of the Mohave Desert. Birds from below the San Diego–Lower California line represent *neutralis* in its best development.

From the Lower California border northward there is a steadily increasing average of black shown on the exposed portions of the middle wing coverts of the males. The females change more abruptly and retain, for the greater part, the *neutralis* type of coloration well north into central Los Angeles County. From the San Fernando Valley northward there is a noticeable change toward *californicus,* black-bellied females occurring occasionally in the San Fernando Valley and Elizabeth Lake regions. In other words, there is a gradual change in the case of the males and a more abrupt change in the females from *neutralis* directly into *californicus.* These two races are very much alike in size and bill. In fact, after having examined 554 specimens I can point to only average color differences to distinguish them. In the vicinity of Tejon Pass in extreme northwestern Los Angeles County, and Cuddy Valley at the east base of Mount Pinos, the black on the middle coverts of the males averages in excess of buff, and the black-bellied type of female outnumbers the streaked type. These points, therefore, arbitrarily mark the southern boundary of *californicus.*

Proceeding westward and northward from Los Angeles County through Ventura and Santa Barbara counties, there seems to be no direct contact with *californicus,* and the females therefore are characteristically streaked. They do, however, average darker than birds from more southern points. The males show an ever increasing amount of black on the middle coverts; but even so far north as Guadalupe Lake, Santa Barbara County, the buff averages predominant over the black. Breeding material from San Luis Obispo County seems to be scarce. I have been able to examine but three adult males and a single year-old male. These are nearer to *neutralis* in measurements but nearer to *mailliardorum* (described below) in color. Because of the absence of females, and taking into consideration the wide gap in San Luis Obispo and Monterey counties, from which no material has been seen, it would appear best for the present to call the San Luis Obispo birds *neutralis,* though they are far from typical.

While it is not the purpose of this paper to go into the subject of the winter ranges, still it may be well to correct here the popular misconception regarding the occurrence of *californicus* in winter in the San Diegan Faunal Area. As has been stated above, the differences between *californicus* and *neutralis* are only average ones, and occasional breeding males from as far south as San Diego County have the middle coverts extensively black. Individual males of this type when taken in winter have often been labeled *californicus.* The point I wish to make is that (with a single exception) every condition observable in winter-taken specimens can be duplicated in breeding birds. The exception is an adult male, no. 10,848, collection of Louis B. Bishop, taken at Witch Creek, San Diego County, April 13, 1904, by H. W. Marsden. This bird has the middle coverts more completely black than any breeding example of *neutralis* so far examined. In view of the date, however, it may be actually a breeding bird. It is equally possibly a vagrant. For the present I prefer to leave the question of its identity open.

Neutralis is resident in the sense that the breeding area is co-extensive with the winter range. A single exception to this statement is an adult male, no. 8205, Museum of Vertebrate Zoology, taken six miles west of Imperial, Imperial County, May 6, 1909, which is unquestionably referable to *neutralis.* This would appear to be a remarkable occurrence both as to time and place.

Specimens examined.—246, of which 174 represent breeding material from the following localities: Lower California: El Rayo in the Sierra Juarez; California: San Diego County: Jacumba, Campo, Lakeside, San Diego, 15 miles north of San Diego, National City, Witch Creek, Del Mar; Orange County: Laguna Beach, Anaheim Landing, head of Laguna Cañon, Capistrano; Riverside County: Riverside, Corona,

Aguanga; San Bernardino County: Redlands, Chino, 6 miles south of Chino, San Bernardino, Colton; Los Angeles County: San Fernando Valley, Alla, Nigger Slough, El Monte, 3 miles west El Monte, Elizabeth Lake, Calabasas, Pomona, Cerritos, Downey, Rancho La Brea, Long Beach, Bassett, Baker, Greening, Pasadena; Ventura County: Point Mugu, Fillmore, Ventura; Santa Barbara County: Santa Barbara, Guadalupe Lake, Point Concepcion, Los Alamos; San Luis Obispo County: Morro, Cuyama Valley at 1900 feet, Santa Margarita, Arroyo Grande.

Agelaius phoeniceus californicus Nelson
California Red-winged Blackbird

Agelaius gubernator californicus Nelson, Auk, vol. 14, 1897, p. 59. (Stockton, California.)

Diagnosis.—Bill similar in shape and size to *Agelaius phoeniceus neutralis*, but males with exposed portions of middle wing coverts more extensively black, rarely clear buff, sometimes entirely black, but usually with a small amount of buff visible, particularly on distal middle coverts. Females averaging much darker throughout and less streaked (more blackish) below. Differs from *Agelaius phoeniceus mailliardorum* in much heavier bill in both sexes. Males with longer tails, and with middle wing coverts less frequently entirely black. Females with slightly shorter wings, underparts usually more streaked, and coloration paler throughout.

Through the courtesy of Dr. Charles W. Richmond, of the U. S. National Museum, I have been privileged to examine the type of *Agelaius gubernator californicus* Nelson. It is an adult female, no. 74,278, U. S. Nat. Mus., collected at Stockton, California, April 17, 1878, by Lyman Belding. Attached to the type is the wing of a male and on the collector's original label is written, "mates—male and female". These data definitely place the type as a breeding individual. In characters, it is representative of the thick-billed interior race and in no way distinguishable from the general run of San Joaquin–Sacramento Valley females. The wing of the male, which is tied to the type, is typical of the interior bird. There is a noticeable amount of buff visible on the distal middle coverts between the red lesser coverts and the black tipping.

Measurements of 24 adult breeding males from San Joaquin County, California:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
121.0-131.0	87.5-97.5	20.9-24.8	11.6-13.0	28.2-31.6	20.0-22.8
(125.7)	(92.3)	(22.8)	(12.3)	(29.4)	(20.7)

Measurements of 4 adult breeding females from San Joaquin County, California:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
101.5-106.0	73.0-77.5	18.9-19.7	10.0-11.4	26.0-26.7	19.0-20.1
(103.8)	(74.9)	(19.2)	(10.6)	(26.5)	(19.6)

Range.—Tejon Pass, in extreme northwestern Los Angeles County, north through the San Joaquin–Sacramento Valley to about four miles south of Red Bluff, Tehama County, California. East in suitable localities into the Sierra Nevada foothills; west to the eastern slopes of the inner coast ranges and to, but not including, Suisun Bay.

Remarks.—The question of the specific distinctness of the *"gubernator"* type of red-wing from the *"phoeniceus"* type has long been debated. Mr. Joseph Mailliard (Condor, vol. 12, 1910, pp. 63-70) was probably the first to demonstrate that the two types were connected by every degree of intergradation and to propose that the name of the California Bicolored Blackbird should become *Agelaius phoeniceus californicus*. With his findings in this regard, I am in absolute agreement. As discussed at length under *neutralis*, the differences between *neutralis* and *californicus* are matters of average coloration. South of the Tejon Pass, the females are, with occasional exceptions, streaked. North of that point, they are usually of the dark-bellied type. Throughout the range of *californicus*, however, females do occur which are indistinguishable from *neutralis*, and in some localities they even outnumber the dark type. The same variation holds good with the males. South of Tejon Pass, the exposed portions of the middle coverts average with buff in excess of black. North of that

point the reverse is true, but individual variation anywhere within the range of *californicus* may produce males which cannot be distinguished from *neutralis*. The transition from *californicus* into *nevadensis* is abrupt and will be dealt with under the latter form. *Californicus* is particularly subject to local variations. One of the most pronounced of these occurs in the San Joaquin Valley, in Merced and Stanislaus counties; birds from this region have heavier bills than the average, and *"phoeniceus"* tendencies come out strongly in a high percentage of individuals.

An extremely interesting case of potential invasion of the range of a dark *"gubernator"* form by a bird of the *"phoeniceus"* type is illustrated by an adult male, no. 33,807, collection of Louis B. Bishop. This bird is marked as having been in full breeding condition, and was taken by Dr. Bishop at the mouth of the Carmel River in Monterey County, June 24, 1922. Every character exhibited by this specimen is typical of the *"phoeniceus"* extreme, which is reached by *californicus* in the vicinity of Los Baños. In its heavy swollen bill, clear buff coverts, and general measurements, it is the very antithesis of *mailliardorum*, the common breeding form of the region in which it was collected. If this bird was actually nesting on the spot where it was taken, then we will have a case of two subspecies breeding in the same locality, and however rare such a condition may be, it will serve as a present-day example of what the writer firmly believes has occurred in the past over a wide area in western North America.

The one-year-old males of the dark races more nearly resemble the adults than do the young males of the *"phoeniceus"* type. The tipping and edging usually so conspicuous in the lighter races is not only darker but also narrower and very often has disappeared altogether by spring. Another condition observed is that the red shoulders frequently come in with the first fall plumage substantially as in the adults. The first year plumage is less durable in character, and young birds by May 1 are in very much the same condition in so far as abrasion and fading are concerned as are adults by June 15, or even by July 1. The orange hue so frequently observed on the shoulders is almost invariably, perhaps always, due to immaturity, and all such birds examined have been young of the previous year. One-year-old males in the extreme development of plumage are almost indistinguishable from adults. They average a more rusty black, however, the bills are usually less attenuated and the wings and tails decidedly shorter. The proportion of streaked one-year-old females to the dark type seems to be higher than in adults. The state of plumage is probably in the main responsible, but many young females are as dark as any adults examined.

Specimens examined.—309, of which 252 represent breeding birds from the following localities: Los Angeles County: Gorman Station in Tejon Pass; Kern County: Cuddy Valley in the vicinity of Mount Pinos, Bakersfield, Buena Vista Lake; Tulare County: Dinuba, Earlimart, Tipton; Kings County: Hanford; Fresno County: Centerville, Clovis, Fresno, 13 miles southwest of Fresno, 1½ miles north of Mendota, 2 miles north of Mendota, 2 miles south of Mendota; Madera County: Lane's Bridge, 10 miles southwest Raymond; Mariposa County: 3 miles northeast Coulterville, Dudley; Merced County: Snelling, Los Baños; Stanislaus County: 2 miles southwest Lagrange, Modesto; San Joaquin County: Tracy, 6 miles southwest Galt, Stockton, 2 miles west Stockton; Yolo County: 2 miles north of Knight's Landing; Amador County: locality not specified; Colusa County: Colusa, 8 miles northeast Colusa, Butte Creek, Fouts Springs; Sutter County: 1 mile west of West Butte; Nevada County: Columbia Hill; Butte County: 4 miles east of Chico, 4 miles north of Oroville; Glen County: 3 miles east of Norman; Tehama County: 4 miles south of Red Bluff, 7 miles south of Red Bluff.

Agelaius phoeniceus mailliardorum, subsp. nov.[1]

San Francisco Red-winged Blackbird

Diagnosis.—Similar to *Agelaius phoeniceus californicus*, but bill smaller and less swollen at base. Females with wing averaging slightly longer, coloration darker and posterior underparts rarely streaked. Males with exposed portions of middle wing coverts usually entirely black.

Type.—Adult female, no. 14,645, collection of Donald R. Dickey; Palo Alto, Santa Clara County, California; April 28, 1901; collected by Theodore J. Hoover, original no. 797.

Description of type.—Supraloral region, lower eyelid and extreme anterior portion of malar region, grayish brown, freckled with darker; auriculars, posterior portion of malar region and sides of throat, fuscous black; superciliary stripe obsolete and indicated only by a few short grayish streaks; chin buffy gray; median portion of throat and upper chest heavily streaked with color of under parts and buffy gray, the former predominating. Lesser wing coverts edged with brownish red on anterior and inner portions, changing to dark olive next to middle coverts. Rest of plumage chaetura black, obsoletely edged with dark brown on head and interscapular region, and with dark gray on sides of neck, and with pale gray on median portions of outer webs of outer primaries. Bill black, changing to dark horn brown near base of mandible; tarsi and feet black; wing, 105.0; tail, 72.0; culmen from base, 18.7; depth at base, 9.6; tarsus, 26.1; middle toe minus claw, 18.8.

Measurements of 15 adult breeding males from Santa Clara and San Mateo counties, California:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
120.0-131.5	82.0-92.0	20.1-23.4	10.8-11.8	27.6-30.0	19.1-22.9
(124.4)	(87.0)	(21.9)	(11.1)	(29.2)	(21.0)

Measurements of 10 adult breeding females from Santa Clara and San Mateo counties, California:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
104.0-108.5	70.5-76.5	18.0-20.1	9.3-10.6	25.4-27.4	17.8-20.4
(105.7)	(73.4)	(19.0)	(9.9)	(26.2)	(18.8)

Range.—Central coast region of California from central Monterey County north at least to Sherwood, Mendocino County; east to include Suisun Bay and the western slopes of the inner coast ranges.

Remarks.—*Mailliardorum* is the darkest of the races of *Agelaius phoeniceus* found in the United States and probably represents in the least diluted form the formerly widespread stock which has so plainly left its mark throughout the west on the invading *"phoeniceus"* strain. Females of the streaked type occur rarely. In San Benito County there is, as would be expected, a tendency toward streaking which reflects the proximity of *californicus;* and in Mendocino County, where an approach to *caurinus* takes place, the same condition is observed. These streaked females are darker than the corresponding type of *californicus,* and they are of course distinguishable by smaller bill. However, streaked birds are far less common than is generally supposed. I am well aware that this statement will not be universally admitted, but the material examined appears to be conclusive on this point.

The misapprehension in this regard has arisen from the fact that *nevadensis,* to mention only one wandering form, is a common migrant and winter visitor over a good part of California and many of the birds linger in the spring on the breeding grounds of other forms. This is particularly true of such one-year-old birds as are non-breeders, and during the early part of the breeding season *nevadensis* has been found in breeding colonies of *californicus, aciculatus, neutralis* and *sonoriensis.* Indeed, in April on the breeding grounds of *aciculatus,* both *californicus* and *nevadensis* occur

[1] Named for Messrs. John W. and Joseph Mailliard, in appreciation of their valuable work with the Red-winged Blackbirds of California.

as vagrants or migrants while the resident form is breeding. Applying field experience gained with the various forms mentioned above to the conditions observable among a large series of spring birds from the range of *mailliardorum*, the same state

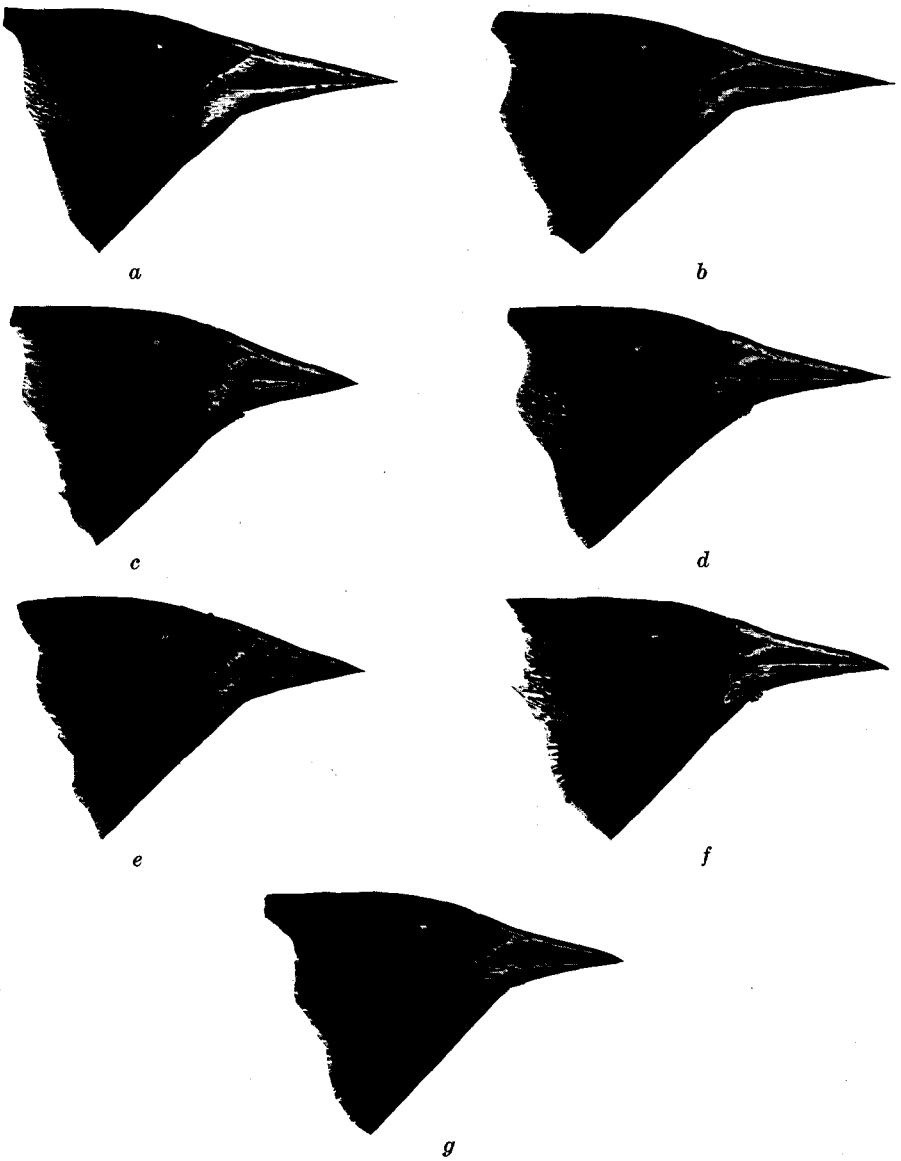


Fig. 75. Bills of typical adult males of *Agelaius phoeniceus*
a, aciculatus (J-219) *b, caurinus* (14,755)
c, neutralis (J-435) *d, sonoriensis* (J-636)
e, californicus (12,553) *f, nevadensis* (J-1467)
g, mailliardorum (KX-12)
Specimens in collection of Donald R. Dickey

of affairs is found. A great many streaked females which have been labelled as belonging to the resident form are indistinguishable from breeding examples of *nevadensis*, others are *caurinus*, while only comparatively few really represent the breeding form.

Some hesitation is felt in applying the name *mailliardorum* to the red-wings of the Suisun Bay region. They are not of the strictly intermediate type which would have been anticipated on geographic grounds; but as their measurements average closer to *mailliardorum* than to *californicus*, they have been referred to the former race. The bills of these birds, while less swollen at the base than in *californicus*, being practically the same as *mailliardorum* in this regard, average longer than typical birds of either form. Occasional specimens which are very similar to these also occur in the southern parts of Sonoma County. In general, the bills of *mailliardorum* from north of San Francisco Bay average slightly longer and more slender than do those from south of that point. The Suisun Bay birds simply represent this tendency in its maximum development.

The present gaps between the known ranges of *neutralis* and *mailliardorum* in the south and between *caurinus* and *mailliardorum* in the north in all probability are due simply to lack of material from these areas. Future field work will undoubtedly show continuous and actual intergradation in both areas, such as occurs between *mailliardorum* and *californicus* in San Benito County.

Mailliardorum is apparently resident. There are undoubtedly local seasonal shifts of population, but I have seen no winter specimens taken outside of the breeding range. The interesting occurrence of a male *californicus* in full breeding condition at the mouth of the Carmel River in Monterey County where *mailliardorum* is the common breeding form is discussed under *californicus*.

Specimens examined.—242, of which 212 are breeding birds from the following localities: Monterey County: Moss Landing, mouth of Carmel River, Carmel, Salinas; Santa Cruz County: Santa Cruz Mountains; San Benito County: Paicines, Tres Pinos, Hollister; Santa Clara County: Palo Alto, Pacheco Pass; San Mateo County: South San Francisco, Half Moon Bay, Salada; Alameda County: Bay Farm Island, Hayward, Newark, Alameda; Contra Costa County: "near Alameda"; Solano County: Suisun, Grizzly Island; Marin County: Drake Bay, Nicasio, Black Point, 5 miles west of Inverness, Point Reyes Station, Tiburon, Corte Madera, San Geronimo; Sonoma County: Petaluma, Santa Rosa, Freestone, Sebastopol, Cotati; Lake County: Lakeport, Glenbrook; Mendocino County: Sherwood, Willitts.

Agelaius phoeniceus aciculatus Mailliard

Kern Red-winged Blackbird

Agelaius phoeniceus aciculatus Mailliard, Condor, vol. 17, 1915, pp. 12-15. (Isabella, Kern County, California.)

Diagnosis.—Size larger and bill longer than in any other Californian race. Males very similar to *californicus* both in individual and average amount of black present on exposed portions of middle wing coverts. Females also paralleling *californicus* in variability, but coloration richer; feather edgings, where present, stronger in tone, with rich browns and buff at a maximum; grays at a minimum.

Measurements of 22 adult breeding males from Kern County, California:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
123.0-131.5	89.0-103.0	25.0-30.3	11.5-13.0	30.2-32.3	21.7-24.0
(126.7)	(95.1)	(27.6)	(12.5)	(31.1)	(23.0)

Measurements of 19 adult breeding females from Kern County, California:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
102.5-107.5	73.5-81.0	22.1-24.6	10.4-11.3	26.0-28.1	18.5-21.0
(104.2)	(77.4)	(23.1)	(10.9)	(27.2)	(20.1)

Range.—Mountain meadows along Kern River and tributary streams in Kern County, California, from Walker Basin north and east to Weldon.

Remarks.—The limited range known to be occupied by this exceedingly well marked race may be extended somewhat when points north and south of its known

metropolis have been investigated. At the present time there is little evidence that *aciculatus* breeds beyond the boundaries indicated above. In this connection I am unable to recognize, as *aciculatus,* the breeding red-wings recorded from the Yosemite by Grinnell and Storer (Animal Life in the Yosemite, 1924, pp. 400-403), for the two specimens so far available (in Mus. Vert. Zool.) fall with *nevadensis* in every particular except for the bill-length in the male, which is certainly exceptionally long (27.9). It is possible that this reflects a tendency toward *aciculatus* rather than an aberrant individual condition, and a series of birds from the Yosemite may alter my present opinion. I know of no specimens of *aciculatus* from the Tehachapi Pass region nor from the mountains between Weldon and the Yosemite.

In view of its coloration *aciculatus* is obviously of *"gubernator"* origin, and because of its isolated habitat it has not been affected by the thick-billed *"phoeniceus"* stock which is now dominant in the San Diegan Faunal Area and in parts of the San Joaquin Valley. Such modification as has taken place has come from the east, from the slender-billed chain, as is at once apparent from bill proportion and shape. The increase in size has probably developed as a local condition, for similar propensities are to be seen in at least one other species from the same region (Dickey and van Rossem, Condor, vol. 24, 1922, p. 209).

Aciculatus departs entirely from its breeding grounds directly after the nesting season. The bulk of the individuals probably winter in the San Joaquin Valley, but because of their comparatively limited numbers the collecting of one is a matter of chance. There is at hand a female taken at Buena Vista Lake on December 30, a young male from the same locality April 14 (not breeding), and an adult male from Corona, Riverside County, December 8. The Corona male is not typical but is best referable to this race.

Agelaius phoeniceus sonoriensis Ridgway

Sonora Red-winged Blackbird

Agelaius phoeniceus sonoriensis Ridgway, Manual of North American Birds, 1887, pp. 369-370. (No type locality in original description, but type later designated as from Camp Grant, Arizona.)

Diagnosis.—Of the slender-billed *sonoriensis-nevadensis-caurinus* chain. Bill longer and more slender than in *nevadensis* and of different shape than in *caurinus.* Males with middle wing coverts more often and more extensively marked with black than in *nevadensis,* and therefore not to be confused in this respect with *caurinus* which is, except in the extreme southwest corner of its range, essentially an immaculate buff-winged form. Pale tipping of feathers in fall plumage more extensive and paler than in the other Californian races, and very frequently persisting (even in fully adult males) on the interscapular region until the bird is in worn (late May) plumage. Females by far the palest of the Californian races. Paler and with narrower ventral streaking than in *nevadensis;* paler and less buffy than in *caurinus,* with markings more diffused (less contrasted) than in that form.

Measurements of 45 adult breeding males from Colorado River Valley in California and Arizona:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
120.0-130.5	86.3-97.5	22.5-26.9	10.3-12.4	27.5-30.6	20.5-22.5
(125.4)	(92.8)	(24.8)	(11.3)	(29.5)	(21.9)

Measurements of 18 adult breeding females from Colorado River Valley in California and Arizona:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
101.5-112.0	72.5-80.5	19.3-21.4	9.5-10.7	24.8-27.3	17.6-20.3
(104.5)	(76.7)	(20.6)	(10.0)	(26.1)	(19.8)

Range in California.—A narrow strip along the Colorado River through its entire Californian course; also irrigated portions of the Imperial Valley north and east to at least 7 miles west of Indio, Riverside County.

Remarks.—Agelaius longirostris was described by Salvadori[1] from a male (evidently adult) which supposedly came from "western Mexico". The measurements given (wing, 111.0; tail, 81.0; tarsus, 28.0; culmen, 27.0; height of bill, 10.0) certainly preclude the possibility that this specimen came from anywhere within the range of *sonoriensis*. Dr. Nelson[2] showed this to be the case some years ago. It may be appropriate to note in this connection that the name is a homonym and inapplicable in any event, Vieillot[3] having used it to describe the Troupial, *Icterus icterus* (Linnaeus).

Through the courtesy of the officials of the United States National Museum the type of *Agelaius phoeniceus sonoriensis* has been sent to me for examination. It is a young female in first winter plumage, no. 49771, U. S. Nat. Mus., Camp Grant, 60 miles east of Tucson, Arizona, February 10, 1867, collected by E. Palmer. This locality is east of the established breeding range of *sonoriensis* as now understood and in a region occupied by both *fortis* and *nevadensis* in winter. Mr. Ridgway[4] himself gives the type locality as "Mazatlan, w. Mexico." It is unfortunate that the type was not selected from this latter locality, for Mazatlan birds are essentially the same as Colorado River valley specimens. In color, the type is not quite like the average from the metropolis of the race and its bill is shorter than any other female *sonoriensis* so far examined. It recalls certain young females of *fortis* in some particulars and its identity may yet be shown to lie in that direction. However, the case demands further material for final solution and I continue to apply the name, for the present, to the birds inhabiting the lower Colorado River and its tributaries and the coastal districts of Sonora and Sinaloa.

The pallid coloration of female *sonoriensis* is reflected in the males, both adult and young. The pale tipping of the feathers of the fall plumage is not only paler than in any other Californian race, but is broader and more extensively distributed. Many fully adult males retain portions of it on the interscapular region until as late as the end of May. The amount of black on the middle coverts is variable, but generally a slight amount is present. Thirty-five out of the 45 adult breeding males from California have amounts ranging from a trace to black very much in excess of buff; in other words, only 10 out of 45 have immaculate buff middle coverts. There is little, if any variation, in this regard between northern and southern extremes; and Mazatlan examples are similar to those from the Colorado River valley. In the eastern parts of the range, however, such as south-central Arizona, males showing black in the middle coverts are of much less frequent occurrence. Although most males show evidences of *"gubernator"* blood, only 5 out of 33 females exhibit any decided trend in that direction. In these there is a smoky gray wash of varying darkness over the whole plumage, except for the chin and throat, which stand out in decided contrast. As noted under *neutralis,* the most persistent character indicative of mixed ancestry is the black in the wing coverts of the males. Specimens from Coachella Valley (Mecca, Thermal, Indio) have somewhat thicker bills than those from the Colorado River valley, which may indicate a tendency toward *neutralis. Sonoriensis* only rarely straggles into the San Diegan Faunal Area after the breeding season, as at Redlands, January 10 (adult female no. 8304, collection of Louis B. Bishop), and Jamacha, San Diego County, October 15 (females of the year, nos. 2801 and 2806, collection San Diego Natural History Museum). The greater part of the California population is resident and exceedingly destructive to crops in cultivated districts.

[1] Atti. R. Accad. Scienz. Torino, vol. 9, 1874, pp. 632-633.*
[2] Auk, vol. 17, 1900, p. 125.
[3] *Agelaius longirostris,* Vieillot, Nouv. Dict. D'Hist. Nat., 34, 1819, p. 547.*
* Citations verified to the originals by Dr. T. S. Palmer and Dr. Alexander Wetmore.
[4] Birds of North and Mid. Amer., pt. 2, 1902, p. 338.

Specimens examined.—210, of which 96 are breeding birds from the following localities: Arizona side of the Colorado River: 10 miles below Cibola, 5 miles north of Laguna, Ehrenberg; California: Fort Yuma, 5 miles northeast of Fort Yuma, Bard, 3 miles northwest of Calexico, Calipatria, 5 miles west of El Centro, El Centro, Thermal, Mecca, 7 miles west of Indio.

Agelaius phoeniceus nevadensis Grinnell

Great Basin Red-winged Blackbird

Agelaius phoeniceus nevadensis Grinnell, Proc. Biol. Soc. Wash., vol. 27, 1914, p. 107. (Quinn River Crossing, Humboldt County, Nevada.)

Diagnosis.—Bill stouter than in *caurinus* or *sonoriensis*, but still decidedly more slender than in *neutralis*. Males with exposed portions of middle wing coverts usually clear buff, but frequently with a small amount of black present, and occasionally with the exposed black even predominant over the buff. Females decidedly less buffy than *caurinus* and with darker and broader ventral streaking than in *sonoriensis*. Not always distinguishable from *neutralis* in coloration, but streaking below averaging narrower and sharper, and bill diagnostic if similar ages are compared.

Measurements of 15 adult breeding males from Humboldt County, Nevada:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
121.0-128.0	88.0-96.5	23.9-26.2	11.2-12.8	28.2-30.9	20.2-23.0
(124.3)	(91.7)	(25.1)	(11.9)	(29.5)	(21.7)

Measurements of 6 adult breeding females from Humboldt County, Nevada:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
99.5-105.0	73.0-77.5	20.1-21.4	9.8-10.5	25.4-27.4	17.2-19.6
(102.3)	(74.5)	(20.8)	(10.1)	(26.3)	(18.7)

Range in California.—Northeastern section of the state from the Oregon and Nevada boundaries south and west to Yreka and Sisson, Siskiyou County, and to Red Bluff and Paynes Creek, Tehama County; thence southeast along the eastern side of the Sierra Nevada to Little Lake, Inyo County. Isolated colonies in the Yosemite Valley, and at several points on the Mohave Desert where local conditions are suitable, as along the Mohave River in San Bernardino County and at Palmdale, Los Angeles County. Shoshone, Inyo County, may not be a breeding station, but such is indicated by a single bird taken May 14; it is also possible that the Little Lake and Palmdale specimens do not actually represent breeding birds.

Remarks.—This widespread link in the slender-billed chain is a common summer visitor to the eastern and northeastern sections of California. In common with other western races, it is subject to local modifications; but these variations are mainly, if not entirely, caused by contact with other races. Individual variations are particularly common in the more western parts of the range. These are in the main variations in the darkness of the underparts of the females and in the presence or absence of black in the middle wing coverts of the males—the usual evidences of mixed ancestry.

The transition from *californicus* to *nevadensis* in the extreme northern end of the Sacramento Valley is abrupt and well defined. Breeding specimens from points seven miles and four miles south of Red Bluff, Tehama County, are clearly referable to *californicus,* while at Red Bluff itself birds occur which are indistinguishable from *nevadensis* from other parts of its California and Nevada range. Females from northern and northeastern California average darker than do those from farther south. Occasional examples occur from the northern part of the state in which the belly is nearly uniform black. Such birds are often decidedly closer to *californicus* in point of color than to *nevadensis,* but their slender bills prevent confusion. Dark-bellied females also crop up occasionally elsewhere in California and to a lesser degree in Nevada, but here again the bills are diagnostic.

By far the majority of the males of this race have immaculate buff middle coverts, but many individuals have traces of black, and occasionally the black is in excess of buff.

This form seems to have a wide winter range. It is common in fall, winter and spring west of the Sierras, from San Francisco Bay south to the Lower California boundary. Its manner of occurrence in winter in the northern and eastern parts of the state is not satisfactorily determined at present.

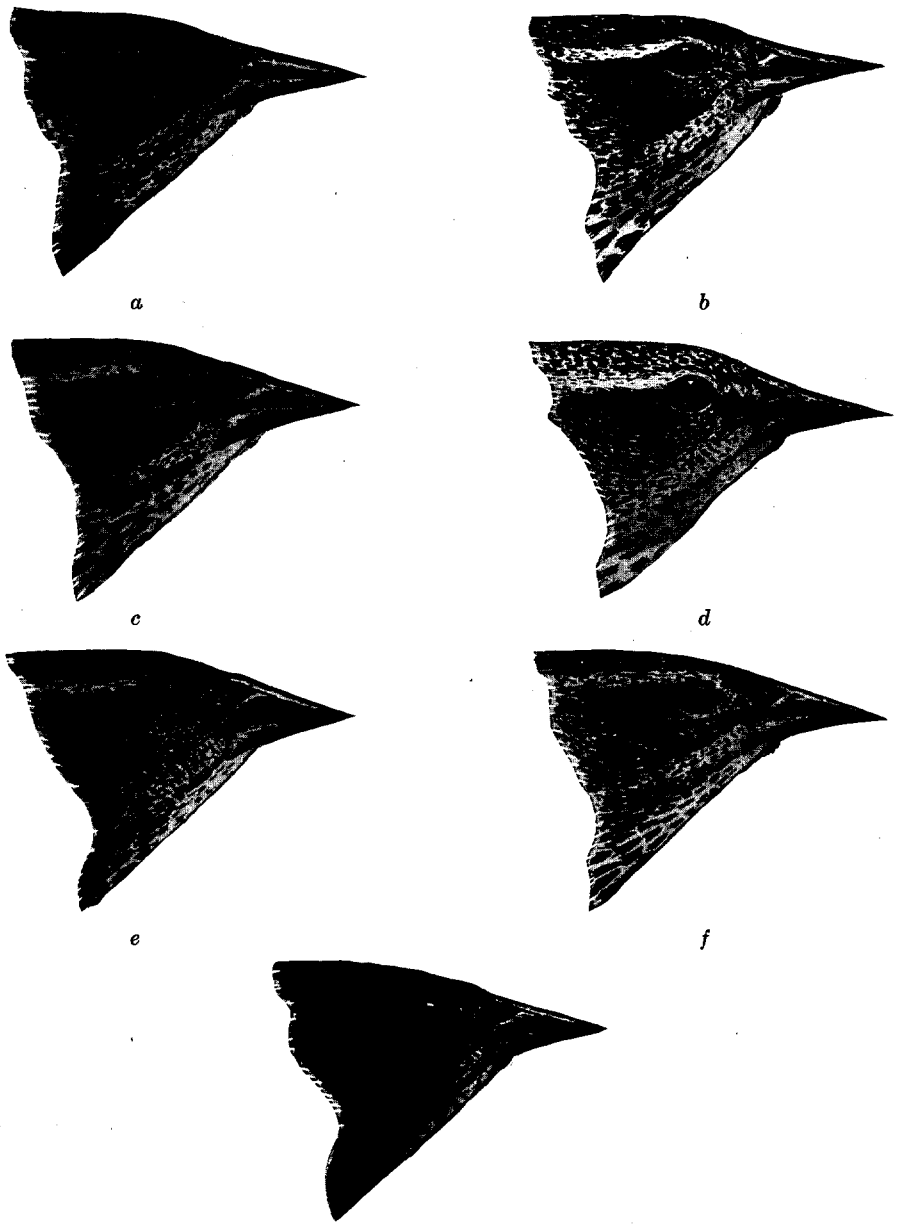


Fig. 76. Heads of typical adult females of *Agelaius phoeniceus*
a, aciculatus (J-241) *b, caurinus* (14,758)
c, neutralis (K-143) *d, sonoriensis* (J-607)
e, californicus (12,565) *f, nevadensis* (12,753)
g, mailliardorum (type, 14,645)
Specimens in collection of Donald R. Dickey

Specimens examined.—405, of which 224 are breeding birds from the following California localities: Los Angeles County: Palmdale; San Bernardino County: Victorville, Oro Grande; Inyo County: Shoshone, Little Lake, Deep Spring Lake, Independence, 2 miles north of Independence, Laws, 4½ miles northwest of Olancha, Lone Pine; Mono County: Oasis, Mammoth, Long Valley, north shore of Mono Lake, Farrington's Ranch on Mono Lake, Gem Lake, 5 miles north Benton Station, Walker Lake; Mariposa County: Yosemite Valley at 4000 feet; Alpine County: Fredericksburg; Eldorado County: Lake Tahoe; Placer County: Tahoe City; Sierra County: Sierraville, Loyalton; Plumas County: Beckwith, Mohawk, Meadow Valley; Modoc County: Clear Lake, Goose Lake Meadows near Davis Creek, Parker Creek in Warner Mountains, Willow Ranch, Jess Valley, 2½ miles southwest Alturas, Sugar Hill, Cedarville, Eagleville; Siskiyou County: Sisson, Edgewood, Weed, Bray, Yreka, Mayten, Big Springs; Shasta County: Cassel; Tehama County: Red Bluff, Elliots (5 miles west Payne Creek Post Office at 1000 feet), Battle Creek Meadows at 4800 feet.

Agelaius phoeniceus caurinus Ridgway
Northwestern Red-winged Blackbird

Agelaius phoeniceus caurinus Ridgway, Proc. Wash. Acad. Sci., vol. 3, April, 1901, pp. 153-154. (Cedar Hill, Vancouver Island, British Columbia.)

Diagnosis.—Bill longer and more slender than in *nevadensis* or *sonoriensis*, and slightly different from either race in shape. Adult males with middle wing coverts clear buff, unmarked with black except in examples from northwestern California and southwestern Oregon, where intergradation with *mailliardorum* has left its impress. Females richly marked in strongly contrasting colors, the plumage being suffused with buff and the feathers edged with rich browns and buffs at the expense of gray tones; the scattered feather edgings of the interscapular region usually light, contrasting strongly with the rest of the plumage.

Measurements of 10 adult breeding males from the coast of British Columbia and Vancouver Island:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
120.0-127.0	88.0-95.5	24.6-27.5	11.1-12.4	28.5-30.0	20.5-23.0
(123.0)	(91.4)	(26.0)	(11.7)	(29.3)	(21.5)

Measurements of 7 adult breeding females from the coast of British Columbia and Vancouver Island:

Wing	Tail	Culmen from base	Depth at base	Tarsus	Middle toe minus claw
97.5-104.0	73.5-78.0	20.5-22.2	9.0-10.7	25.1-26.9	18.6-20.0
(101.8)	(76.4)	(21.6)	(10.2)	(26.2)	(19.1)

Range in California.—A narrow strip along the Pacific coast from the Oregon line south at least to Humboldt Bay.

Remarks.—The breeding range of *caurinus* in California is comparatively limited, and birds from this state are by no means typical of the race. Breeding individuals occur which are inseparable from British Columbia examples, but, in the main, California birds are more or less intermediate toward *mailliardorum*. This intergradation is indicated by characters; but there is little doubt that geographical contact between these two races will be demonstrated when more work has been done in the humid northwest coast belt of California. Meantime, in Humboldt County, two of eight adult males at hand display extensive amounts of black on the middle wing coverts, while two out of an available series of ten females tend strongly toward *mailliardorum* in coloration. As a whole the Humboldt County series tends definitely toward *mailliardorum* both in bill shape and in general measurements.

Caurinus winters much farther south than is generally supposed. It is of common occurrence in the San Francisco Bay district (many specimens, October 19 to April 19) and in the San Joaquin Valley (Modesto, October 15 to March 19), south, casually at least, to Buena Vista Lake (December 30).

Specimens examined.—141, of which 22 represent breeding birds from the following Californian localities: Humboldt County: Trinidad, Eureka, Humboldt Bay (mouth Mad River); Del Norte County: Requa.

Pasadena, California, June 1, 1926.