

REVISION OF THE AVIAN GENUS PASSERELLA
WITH SPECIAL REFERENCE TO THE
DISTRIBUTION AND MIGRATION
OF THE RACES IN CALIFORNIA

BY
H. S. SWARTH

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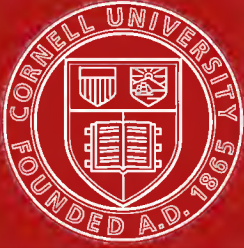
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BY
H. S. SWARTH

(Contribution from the Museum of Vertebrate Zoology of the University of California)

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INTRODUCTION

The genus *Passerella* contains but one species, *Passerella iliaca*, the fox sparrow, confined to North America, and distributed over the greater part of the continent. In the eastern two-thirds of the general habitat, from northern Alaska to Newfoundland, the fox sparrow occurs as one relatively uniform subspecies, in the Pacific Coast and Rocky Mountain regions as a number of more or less widely differentiated local races. Sixteen subspecies are formally recognized in the present paper. All the forms of *Passerella* are migratory, most of them traveling long distances between their summer and winter homes. The eastern race, *iliaca*, occurs in California as a rare straggler in winter; each of the other fifteen subspecies occurs more or less abundantly in California at one season of the year or another.

The Museum of Vertebrate Zoology has gradually acquired a fairly extensive representation of fox sparrows, mostly collected by various field expeditions. This collection consists in part of series of most of the subspecies collected upon their breeding grounds, in part of miscellaneous non-breeders of various subspecies, taken as migrants and winter visitants. Of late years it has become increasingly difficult to coördinate the museum arrangement of many of these specimens with current classifications and descriptions. Inconsistencies were apparent but the remedy was not so readily seen. At the same time the Museum was being called upon constantly to identify specimens, sometimes single birds, sometimes extensive series, sent in for this purpose by collectors in various parts of the state; while every effort was made to satisfy such requests, the questions asked could not always be satisfactorily answered.

It seemed desirable to bring together as large a series of *Passerella* as was to be had, in expectation that careful study of material known to be available would, among other things, permit of a clearer definition of the subspecies and their characteristics than had yet been put forth. This study has proven far more complicated than was at first apparent, and while I feel that it has resulted in a much clearer perception of the nature of the problem, I cannot assume to have finally disposed of many of the questions involved.

In this connection my attention has been frequently called to the desirability of supplying bird students with a "key" or some similar

means of identifying specimens of *Passerella* readily as captured. This, from the nature of the case, I fear can not be done, can never be done. I believe it to be possible, at the present state of our knowledge, to arrive at a solution of the fox sparrow problem that will enable anyone to identify accurately perhaps ninety per cent of the specimens taken, but it is to be doubted if diagnoses can be prepared enabling anyone positively to identify *all* specimens of *Passerella* secured. Even with the exceptional facilities I have enjoyed, I would not guarantee the correct allocation of all the birds examined in the present study. Intergrades between two forms may resemble a third and, taken in their winter home, may have their characters wrongly interpreted. Also immatures of one form may bear some resemblance to adults of another, as is sometimes seen in the thick-billed subspecies of the Schistacea group. Many specimens may be identified as of certain subspecies on the basis of large comparative series, whereas from one skin or a few it would be difficult to understand the allocation.

Some of the difficulties encountered in identifying specimens may be understood from the following facts. *Passerella* is variable to an extreme degree, and intergradation of characters apparently occurs wherever two races come together. Thus, in the chain of subspecies extending along the coast of southern Alaska and British Columbia there are intergrades to be found between any two contiguous forms. There is also, judging from winter birds, intergradation between each of these coastal races and some inland form—*iliaca* or *altivagans*, most likely. The nature and extent of this latter type of intergradation, as regards breeding birds, is still almost unknown, though winter specimens apparently indicative of its existence are not uncommon. It will be seen from this that in the Unalaschcensis group of subspecies as a whole there is an extremely wide range of variation possible.

Of breeding birds of these six subspecies there are available fairly extensive series of each race from several localities, but the map (fig. N) will show what vast stretches of country there are as yet not represented in collections. Series of summer birds from any one place are signally uniform in appearance, so it is evident that an explanation of the great range of variation seen in series of migrants and winter birds is to be sought in the study of specimens from many summer stations—the variation in a series of stations rather than among many specimens from one place.

As regards the difficulty of identifying the *Unalaschensis* subspecies in the winter home in California, there are the following features of the problem to be considered. These races are arranged linearly along the coast in their summer habitats, and the centrally located subspecies intergrade, each one, with the races to the north and to the south. Thus, for example, there are individuals of *sinuosa* that approach *unalaschensis*, and others that are close to *annectens*. It might happen that a collector in California, in a limited series of birds, would have the two extremes represented. Comparison with sufficient material would show that his two diverse specimens must both be referred to the same form, in this case *sinuosa*, yet to his eye they would evidently be quite as unlike as other specimens labeled as of distinct subspecies. This is something that must be borne in mind in the consideration of small series of specimens.

In the Schistacea group (the thick-billed and slate-colored sparrows, so-called) there is another confusing factor. Among these subspecies the most variable feature is the bill (see fig. D). While the different subspecies are distinguished by smaller or larger bills, there is also (most noticeably among the larger-billed forms) some difference in this regard between young and old. For example, a young *stephensi* might have a bill of about the size of an adult *mariposae*, and a young *mariposae* one of about the size of an adult *monoensis* (see fig. DD). It is not possible to tell, of course, whether the bill of an early fall migrant, taken far from its summer habitat, has or has not reached the maximum of growth, and in birds that are otherwise alike, it is easy to perceive the source of confusion that this variable feature may be. Aside from this complication there is in this group again undoubted intergradation between subspecies at the margins of their habitats. A thorough understanding of conditions in this section of the genus requires material from many more localities than are here represented.

Osgood (1909, p. 17) in speaking of the mammalian genus *Peromyscus*, makes the following comments, which, as is seen from the statements in the preceding paragraphs, apply as well to *Passerella*. "Classification becomes, then, as has been said [by Ridgway, 1901, p. x], like dividing the spectrum and depends largely upon the standards set, for, theoretically at least, the possibilities of subdivision are unlimited. It is not strange, therefore, that hundreds and even thousands of specimens are intergrades almost equally resembling

two or more adjacent forms. Many of these intergrades for convenience may be referred with some degree of assurance to the form they most closely resemble, but many specimens fall so near the imaginary line between two or more subspecies that it is practically impossible to classify them other than as intergrades."

It must not be assumed from the above statements that I am dubious of the validity of the subspecies so far described. Far from it. Each of them is readily apparent in typical form, and certainly deserving of nomenclatural recognition. In the course of this study it has been considered necessary to supply names for races not heretofore recognized but quite as distinct as some of older standing. Furthermore, it would have been possible to have bestowed some additional names, as will be seen in discussions of specific cases farther on, but it did not seem to me that I should be justified in doing so at the present time. It is thus evident that this study of *Passerella* is not presented as the final word on the subject. In fact, it has become clearly apparent that, abundant as the available material has been, compared with what previous students of the group have had, some future worker should certainly take up the subject with the advantage of vastly more extensive series. I am quite convinced, however, that whatever changes such future reviser may advance, he will not reduce the number of subspecies now recognized. I am inclined to believe that this future student will adopt an attitude similar to that assumed by Sumner (1918, p. 184) in one of his studies on variation and heredity in *Peromyscus maniculatus*: "I am not in the least concerned with characterizing and defining those taxonomic groups which have been called *Peromyscus maniculatus gambeli*, *rubidus* and *sonoriensis*. I shall merely discuss the differences between (and within) four representative collections taken by me in widely separated and climatically different regions of the state. The question as to what 'subspecies' a given mouse 'belongs to' is for my purposes a distinctly minor consideration."

With a thorough appreciation of this method of treating the finer divisions of a species, in the lesser degree of separation used in the present study of *Passerella iliaca* it seemed advisable to attach a name to each skin. The necessity of cataloging museum specimens impels such action even were there no other reason to do so. It must be evident, however, that in the present case (the treatment of *Passerella iliaca*) the usage of this system of nomenclature is purely an artificial contrivance, just such an aid as the drawing of checkerboard squares

upon a paper to facilitate the outlining of a map. The fact that I place certain groups of birds within certain adjacent squares must not be construed as a belief that the two are essentially different from one another in just the same way as all other "subspecies" are, and that such differences persist to the edges of each square. Radical differences do exist between certain closely adjacent subspecies of *Passerella*; they undoubtedly do not exist between certain others here recognized. It is simply most convenient to utilize subspecific names as is here done, provided it be understood just what they stand for.

I wish to make it clear that in my own mind the whole treatment here accorded the different forms of *Passerella iliaca* is but an outline, correct as far as it goes, I trust, but with much detail still to be filled in. I have had the advantage of far greater series of specimens, from many more localities, than any previous student of the group. This material has been carefully and leisurely studied, I have arranged the observed facts and drawn my conclusions to the best of my ability, and I have checked up my results in various ways. I believe my conclusions are sound as far as they go, but it will be seen that necessarily many deductions have been drawn from, and hypotheses erected upon, data derived from winter birds. A satisfactory demonstration of the truth of such conclusions is to be attained only after the accumulation of more material and of much additional information as regards conditions in the summer homes of the several forms, notably so as regards variation at the margins of these habitats. It is not only specimens that are required, but careful study of the living birds in their natural surroundings.

MATERIAL AND METHODS OF TREATMENT

There are 717 specimens of *Passerella* catalogued to date in the collection of the Museum of Vertebrate Zoology. An especially valuable feature of this collection of fox sparrows lies in the extensive series of breeding birds from points on the northwest coast and from the mountains of California. Private collectors in California have, in the mass, accumulated large numbers of these birds, mostly winter visitants, and in a great many cases such collectors have sent their specimens to this Museum to be identified. The loan was solicited of all private series known to be existent in California, and in every case this privilege was freely granted and the specimens suffered to remain here as long as they were needed. A preliminary survey of

the material thus assembled served to show the nature and extent of the more important gaps still remaining, and requests were made for the loan of skins from such museums as it was supposed might possess the needed specimens. Here, again, the aid requested was most cordially rendered.

To each and all of the institutions and individuals who have aided in the prosecution of this study by such loans I wish here to express my gratitude for their generous help. The list of the institutions who have thus contributed is as follows: American Museum of Natural History, New York; California Academy of Sciences, San Francisco; Carnegie Museum, Pittsburgh; Field Museum of Natural History, Chicago; Museum of History, Science and Art, Los Angeles, California; Provincial Museum, Victoria, British Columbia; University of Kansas Museum, Lawrence, Kansas; United States Biological Survey; United States National Museum; Victoria Memorial Museum, Ottawa, Canada. Private collectors to whom similar acknowledgment is due for the loan of specimens are as follows: L. B. Bishop, Allan Brooks, F. S. Daggett, W. L. Dawson, D. R. Dickey, W. O. Emerson, J. H. Fleming, J. Grinnell, A. B. Howell, S. G. Jewett, C. Lamb, J. E. Law, John W. Mailliard and Joseph Mailliard, L. H. Miller, G. F. Morcom, J. A. Munro, J. R. Pemberton, W. M. Pierce, C. H. Richardson, F. J. Smith, A. Wetmore, G. Willett, L. E. Wyman. A small series from the writer's private collection was also available. The total material assembled from the above sources was approximately 1800 specimens. The writer was enabled to examine the type specimens of fourteen of the sixteen subspecies here recognized, that is of all save *iliaca* and *unalaschcensis*, which are presumably non-existent.

It seemed advisable to list every specimen examined, and this accordingly has been done, with entry of such data as appeared essential. Where quotation marks are used the items thus enclosed are copied verbatim from the labels; this usage is followed, as a rule, where the facts are obscure. In these birds variation is so extensive and of such a nature that not only might different people arrive at different conclusions after study of the same material, but the same person might handle certain skins at different times and label them differently each time. The habit of migration in *Passerella* adds a further complication in the classification of individual specimens taken at points other than the summer home, giving rise to difficulties such as are summarily dismissed in the case of similarly variable but non-migratory species.

Under the circumstances the only way of definitely indicating my opinion of each and all of the specimens serving as the basis for the conclusions formulated in this study, for the benefit of any future student of the group, was to list each individual bird handled. This I have done, with but few exceptions. For some time before settling down definitely to a careful study of this subject, I had kept notes upon the series of fox sparrows sent to the Museum for identification. It was not possible, later on, to reexamine all of these birds, and while I have used data regarding distribution, etc., acquired from such specimens, I have not been able to enter them all in the lists of specimens examined. Thus the charts showing the relative abundance during winter of different subspecies in different parts of California, are based in part (though in but a small degree) upon specimens not entered in the lists.

There are in each series of winter birds certain equivocal specimens that are hesitatingly referred to one subspecies or another, though typical of none. When such doubtful birds happen to have come from points outside the winter metropolis of the race to which they are referred, they are not included in the diagrammatic charts of winter visitants (tables 1, 2, 3).

For obvious reasons it was not possible for me to use published records of occurrence without examining the specimens upon which such statements were based. Consequently, I have ignored all such records. The spots upon the maps herewith presented are each one indicative of a specimen or specimens handled by myself; they reflect my own opinion of the proper classification of that specimen, and not the published idea of someone else.

Birds are catalogued in the lists of specimens examined, as to sex, and also as to age, being indicated as adult ("ad."), immature ("im."), or juvenile ("juv."). These terms are used with definitely restricted meanings. "Juvenile" is correlated with the juvenile plumage, the soft, lax feathers following the natal down, and worn for but a few weeks. "Immature" applies to the first annual plumage, following the juvenile stage, and usually acquired in *Passerella* in August or early September. I have been unable to detect any certain and constant differences of plumage between young and adult fox sparrows after the annual late summer molt, but young and old may be differentiated for some months thereafter, sometimes until December, by examination of the skull when the bird is skinned. Collectors for the Museum of Vertebrate Zoology have been carefully instructed

in this method of ascertaining the age of birds, and it is upon this basis only that autumn specimens of *Passerella* are listed in the present paper as immature or adult. In the case of material obtained from outside sources the age of autumn specimens is not indicated in these lists even though marked upon the label, unless the collector is known to have used the same method. Midsummer birds, however, are entered as "adult," as distinguishing breeding individuals from juveniles.

Color terms are from Ridgway (1912).

Measurements are in millimeters, and taken as follows:*

Length of wing.—A straight line from the bend of the closed wing to the tip of the longest primary, with these feathers in their natural position (not straightened).

Length of tail.—From the point of insertion of the middle rectrices to the tip of the longest.

Culmen.—Measured in a straight line from a point where the feathers cease to hide the culmen, to the tip of the maxilla, the line *b c* on the accompanying diagram (fig. A). The unfeathered ridge of the culmen extends backward a little way between rows of overlapping feathers which cover it, but the measurement back to the edge of the first intercepting feather base is no more constant than the slightly variable standard above indicated.

Depth of bill.—From the base of the culmen as above indicated, to the angle formed by the feathers at the lower edge of the ramus of the mandible.

The measurement secured by placing the points of the calipers at *b* and *a*, as indicated on the accompanying diagram (fig. A).

Width of bill.—Measured at the base of the lower mandible, the line *d e* as shown on the diagram (fig. A).

Tarsus.—A straight line from the center of the heel joint on the posterior side to the joint between the metatarsus and the middle toe on the anterior side. In *Passerella* the lower point indicated is at the lower edge of the last scale that completely covers the front of the "shin." (See fig. B, *a* to *b*.)

Hind toe with claw.—Measured along the under side, from the joint between the hind toe and the metatarsus to the tip of the claw. (See fig. B, *e* to *d*.)

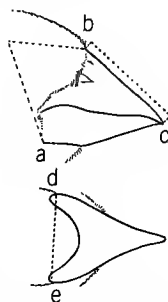


Fig. A. Showing methods of taking measurements of the bill used in this paper. *b* to *c*, length of culmen; *b* to *a*, depth of bill; *d* to *e*, width of bill.

* These measurements are based upon the system used by Oberholser (1912, p. 533), but with modifications, as indicated.

Middle toe with claw.—Measured along the upper side, from the joint between the metatarsus and the middle toe to the tip of the claw. (See fig. B, *b* to *c*.)

In measuring the toes the claws were included as features showing considerable variation in certain of the subspecies.

As regards the bill, the fact has been brought out that certain readily appreciable differences may exist in this structure that are not made apparent by tables of measurements. Thus the bill differences between *stephensi* and *brevicauda* and between *mariposae* and *megarhynchus*, are largely due to variation in the lateral outlines,

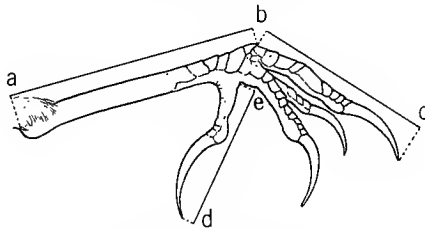


Fig. B. Showing methods of taking measurements of the foot used in this paper. *a* to *b*, tarsus; *b* to *c*, middle toe with claw; *d* to *e*, hind toe with claw.

producing an attenuated bill as it is bowed in, a stubby one as it is bowed out (see fig. Y). Measurements may fail to show a difference between individuals that is quite apparent to the eye.

HISTORY

The eastern fox sparrow was described and figured by Merrem in 1786, under the name *Fringilla iliaca*. I am indebted to Dr. T. S. Palmer for forwarding to me information received by him from Dr. C. W. Richmond, to the effect "that the type specimen was presented to the Museum in Munich or to Merrem by a Hessian officer. This would indicate that it was a winter specimen taken somewhere between Boston and Charleston and possibly between New York and Washington."*

Merrem's publication is an exceedingly rare book. The title of the work is given in full by Coues (1896, p. 265), in the description of a copy of the Latin edition handled by him in London. The page reference given by Coues (*loc. cit.*) for *iliaca* is different from that

* I have an impression of having seen essentially the same statement in print somewhere during the last year or so, but have mislaid the reference and have been unable to rediscover the paper.

given by Ridgway (1901, p. 388), though the plate reference is the same in each case. The latter author cites the German edition of the book, so presumably the differences of pagination noted occur in the two different editions.

In 1788 there appeared Gmelin's (1788, p. 875) description of *Emberiza unalaschcensis*, based upon the Unalashka Bunting of Latham (1782, p. 202) and Pennant (1785, p. 364). This name has generally been applied to the fox sparrow of the north Pacific coast, of later years restricted to the bird of the Alaska Peninsula and some nearby islands.

The genus *Passerella* was characterized by Swainson (1837, p. 288), including the one form *iliaca*.

In 1838 *Plectrophanes townsendi* was figured by Audubon in his "Birds of America," as from the "shores of the Columbia River," while in 1839 in the "Ornithological Biography" he applies the name *Fringilla townsendi* to the same bird.

In 1839 another fox sparrow was named, Vigors' report on "The Zoology of Captain Beechey's Voyage" containing the description of a new sparrow, *Fringilla meruloides*, recognizable as pertaining to a *Passerella*, but not, in the present writer's opinion, applicable to any one subspecies.

In 1858 (p. 490) Baird described *Passerella schistacea* in volume ix of the Pacific Railroad reports, the first of the slaty colored forms to be pointed out. As shown by the wording of his diagnosis and comments, there is confusion of two distinct forms in this description. The type specimen of *schistacea* is clearly indicated as a specimen from the Platte River, the description as evidently applies to a quite distinct form from California. The mistake is in a measure rectified in the appendix to the same volume (*loc. cit.*, p. 925), where the name *Passerella megarhynchus* is (rather hesitatingly) applied to the birds from Fort Tejon, no exact type being here indicated.

There was by that time, and for a number of years following, a general recognition of three or more divisions in the species, the eastern fox sparrow, *Passerella iliaca*, the northwest coast Townsend sparrow (sometimes considered under the name *townsendi*, sometimes under that of *unalaschcensis*), and the western thick-billed sparrow (*megarhynchus*), of uncertain relationship with the slate-colored (*schistacea*).

No résumé of the historical side of the study of the genus *Passerella* would be complete without full recognition of the valuable paper

written in 1878 by H. W. Henshaw "On the species of the genus *Passerella*." While the series of specimens at his disposal must have been relatively meager, his treatment of the various forms is wonderfully in accord with the facts as learned from subsequent discoveries; and, in the light of our present knowledge of the subject, it is intensely interesting to note the pertinence and accuracy of Henshaw's critical comments upon the specimens he handled. The present writer could hope for no better fate for his own paper than to have such tentative hypotheses and suggestions as he has ventured to offer as fully justified by later discoveries.

In contrast with Henshaw's remarks attention may be called to Coes' (1874, pp. 162, 163) deprecatory and rather pessimistic inclination "to doubt the distinctness of any of the currently reputed species of *Passerella*," without in any way aiding to unravel the puzzle. His statement (*loc. cit.*) that "in any event *P. 'schistacea'* goes with *townsendii* as a paler variety," is obscure as an expression of belief, and, in any interpretation, by no means as final an expression of relationships as the wording would imply it to be.

In 1895 Anthony described *Passerella iliaca stephensi*, a large-billed variant of *megarhynchus* from the San Jacinto Mountains, southern California. In 1899 Ridgway described *Passerella iliaca fuliginosa*, an extremely dark colored bird of the *townsendii* style, from Neah Bay, Washington. In this same year (1899) there occurred the Harriman Expedition to Alaska, and the fox sparrows collected at various points by the naturalists participating resulted in a much better understanding of the variation occurring within this species. In 1900 Ridgway, a member of the above-mentioned expedition, described *Passerella iliaca insularis* from Kodiak Island, and *Passerella iliaca annectens* from Yakutat Bay, giving at the same time (1900, p. 30) a brief statement of the ranges of the five subspecies he recognized from the northwest coast.

The next year, 1901, there appeared the first volume of Ridgway's "Birds of North and Middle America," dealing with the Fringillidae, and including the diagnoses of the nine subspecies of *Passerella iliaca* recognized by that author. These were as follows: *iliaca* (northern and eastern North America), *unalaschcensis* (Shumagin Islands and Alaska Peninsula), *insularis* (Kodiak Island), *annectens* (Yakutat Bay region), *townsendii* (coast of extreme southern Alaska), *fuliginosa* (coast of British Columbia, Vancouver Island, and Puget Sound),

schistacea (Rocky Mountain district of the United States and British Columbia), *megarhynchus* (Sierra Nevada, California), and *stephensi* (high mountains of southern California).

In 1910, Grinnell described *Passerella iliaca sinuosa*, from the Prince William Sound region, Alaska. The same year the third edition of the American Ornithologists' Union check-list was also published, giving recognition to all the forms of *Passerella iliaca* recognized by Ridgway except *annectens*, which is here lumped with *insularis*. In 1911, Riley discovered *Passerella iliaca altivagans*, in the interior of British Columbia and Alberta.

In 1917, Grinnell and Storer described *Passerella iliaca monoensis*, from the east slope of the central Sierra Nevada, California. In 1918 Mailliard named *Passerella iliaca brevicauda*, an interesting form that had long been confused with *stephensi*. In the same year, and as a result of the studies upon which the present report is based, Swarth described *Passerella iliaca mariposae* (previously lumped with *megarhynchus*), *Passerella iliaca fulva* (previously lumped by different authors, sometimes with *megarhynchus*, sometimes with *schistacea*), and *Passerella iliaca canescens* (previously lumped with *schistacea*).

Not many synonyms have been published of the subspecies of *Passerella iliaca*. *Fringilla ferruginea* Gmelin (1788, p. 921), *Fringilla rufa* Wilson (1811, p. 53, pl. 22, fig. 4), and *Passerella obscura* Verrill (1862, p. 143) are regarded by Ridgway (1901, pp. 388-389) as synonyms of *Passerella iliaca iliaca*. The present writer has made no attempt at a critical study of variation within this subspecies. *Emberiza (Zonotrichia) rufina* Kittlitz (1858, p. 200) is by the same authority placed in the synonymy of *Passerella iliaca townsendi*. Aside from these the only conflicting names are *Fringilla meruloides* Vigors (1839, p. 19), from Monterey, California, and *Passerella iliaca annectens* Ridgway (1900, p. 30), from Yakutat, Alaska, the respective claims of which are treated at length elsewhere in this paper.

VARIATION IN *PASSERELLA ILIACA*

In this species variation due to age, sex and season of the year is extremely slight. The juvenal plumage is essentially the same as in the following stages, with regard to color and markings, the distinguishing features of the first mentioned being mainly due to the different texture of the feathers. Where color differences are concerned as of subspecific value, the young birds show these differences

just as do the adults. As regards the later stages, I am unable to distinguish any differences between immatures in first winter plumage and adults a year or more old. As to sexual differences, males average slightly larger than females, but in color and markings there is no discernible variation. Seasonal differences are shown solely as the result of wear and fading of the feathers. There is but one annual molt, after the juvenal stage is passed, occurring in the late summer and including the entire feather covering, with no assumption of a

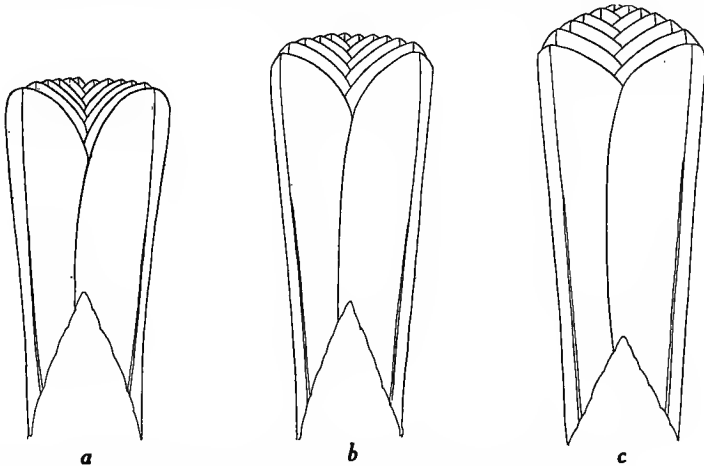


Fig. C. Tails of three subspecies of fox sparrow, natural size.

a. *Passerella iliaca iliaca*, adult male; no. 6088, Mus. Vert. Zool.; Eastford, Connecticut; April 12, 1876.

b. *Passerella iliaca unalaschensis*, immature male; no. 26031, Mus. Vert. Zool.; near Yosemite Point, Yosemite National Park, California; October 30, 1915.

c. *Passerella iliaca mariposae*, adult male; no. 29089, Mus. Vert. Zool.; Sisson, Siskiyou County, California; May 15, 1918.

special breeding dress such as is seen in so many species of birds. Consequently, a study of variation in this group is narrowed down quite closely to a consideration of but one category of differences, namely, geographic variation.

The widely distributed fox sparrow (*Passerella iliaca*) is variable to an extreme degree, and many subspecies have accordingly been described from different parts of its range. In the number of recognizable local races developed, *Passerella iliaca* is second only to the song sparrow (*Melospiza melodia*) and the horned lark (*Otocoris alpestris*) in North America; the extremes of geographic differentiation attained are at least as great as in any other North American bird species. In the genus *Passerella* the principal lines of variation lie (1) in coloration—ranging from bright reddish browns to clear

grays; (2) in relative lengths of wing and tail; and (3) in varying development of the bill. Character of markings is practically the same in all the subspecies, viz., wings and tail reddish, upper parts of head and body nearly or quite uniform in color, and lower parts with sharply outlined spots and streaks upon a whitish ground. There is one inconspicuous marking that is common to all forms of the species, a small, whitish spot on each side of the forehead, immediately above the lores, constituting a feature that is present in about equal degree in all the subspecies, widely diversified as they may otherwise be in color. The two wing bars, formed by the lighter colored tips of the reddish greater and lesser coverts, most conspicuous in *Passerella iliaca iliaca*, appear sporadically, sometimes as a mere trace, in all the other races, more particularly in the juvenal plumage.

In following the course of variation in *Passerella*, the several subspecies may first be separated into three main divisions to be termed, respectively, the Iliaca group, the Unalaschcensis group, and the Schistacea group. These groups, their component subspecies, and their outstanding characteristics, may be indicated as follows:

GROUP 1. Iliaca

Subspecies

- | | |
|------------------|----------------------|
| 1. <i>iliaca</i> | 2. <i>altivagans</i> |
|------------------|----------------------|

Coloration: Bright reddish and clear gray.

Proportions: Tail shorter than wing; bill of medium size.

GROUP 2. Unalaschcensis

Subspecies

- | | |
|--------------------------|----------------------|
| 1. <i>unalaschcensis</i> | 4. <i>annectens</i> |
| 2. <i>insularis</i> | 5. <i>townsendi</i> |
| 3. <i>sinuosa</i> | 6. <i>fuliginosa</i> |

Coloration: Reds predominating, becoming darker from north to south; grays at a minimum.

Proportions: Tail shorter than wing. Bill of medium size, diminishing from north to south.

Greatest variation in color; proportions relatively uniform.

GROUP 3. Schistacea

Subspecies

- | | |
|------------------------|---------------------|
| 1. <i>schistacea</i> | 5. <i>canescens</i> |
| 2. <i>fulva</i> | 6. <i>monoensis</i> |
| 3. <i>megarhynchus</i> | 7. <i>mariposae</i> |
| 4. <i>brevicauda</i> | 8. <i>stephensi</i> |

Coloration: Grays predominating, increasingly so toward the south; reds at a minimum.

Proportions: Tail rarely equal to, usually longer than, wing. Bill extremely variable, increasing in size westward and southward.

Greatest variation in proportions; color relatively uniform.

In a study of geographic variation in these birds there are some features deserving of the strongest emphasis. Before proceeding with an analysis of the above indicated divisions it is advisable briefly to summarize certain of these important points, the details of which are dwelt upon at length further on in this paper. Fox sparrows belonging to what I have termed the *Unalascensis* group occur on the Pacific coast of North America, from the Alaska Peninsula to Puget Sound, in practically continuous distribution. From the northern extremity of this narrow coastal strip to the southern, definite lines of variation may be traced without a break. Beginning at the north, with the large-sized, large-billed, and pale colored *unalaschensis*, there is a series of gradual changes to the southward culminating in the small-sized, small-billed, and extremely dark reddish *townsendi*. Farther south, *fuliginosa*, though still darker colored, shows some increase in size. Between the extremes there are birds exemplifying several well-defined, intermediate steps, occurring within definitely circumscribed areas, and recognized as separate subspecies. Between each two abutting races intergrades occur; it is of common occurrence to find individuals so exactly intermediate between any two geographically adjacent subspecies of this group that their allocation must be rather arbitrarily determined.

There is here distribution of a bird species that is presumably continuous in part (upon the mainland), and is discontinuous in the occurrence of the birds upon the many islands along the coast. One strongly marked island subspecies has resulted, *insularis*, upon Kadiak Island. As in no other instance has similar insulation resulted in the production of distinguishable races upon other islands, it is consequently questionable to what extent *insularis* owes its strongly marked characteristics to this cause. On the contrary, we see *sinuosa* occurring on several islands and on the nearby mainland, with no differentiation. A still stronger example is afforded in *townsendi*, which occurs on the mainland, on several, if not all, of the islands of the Alexander Archipelago, and on the relatively remote Queen Charlotte Islands, practically unchanged throughout this disconnected habitat. This is still more striking when we consider the differentiation that has arisen in other bird species upon the Queen Charlotte Islands. This differentiation in the cases of the Queen Charlotte hairy woodpecker (*Dryobates villosus picoides*) and the Queen Charlotte jay (*Cyanocitta stelleri carlottae*) is a darkening of color as compared with their nearest relatives, and considering that the trend

of variation of *Passerella* is toward darker coloration as this region is approached from the northward, it is doubly surprising to find the fox sparrows upon these islands developing no departure of this sort from the mode of the subspecies farther north. On Vancouver Island is the abruptly darker *fuliginosa*, but this race occurs upon the mainland also, in northwestern Washington, so insularity here cannot be brought forward as the cause of the difference.

Thus in the Unalascensis group, while there is continuous, gradual, and well defined variation in characters from one extreme to another, with abrupt accentuation of certain features at intervals (serving for the definition of the several subspecies), the dividing lines between the forms do not, to our knowledge, fall where there are physical barriers to distribution (save in *insularis*), and we do know that there are many such barriers that have no effect. In just one case, in the subspecies *insularis*, is there a race restricted to an island habitat.

Now, turning to the Schistacea group of subspecies, we find almost exactly the same sort of variation under widely different conditions. These birds inhabit mountain tops; they form colonies occupying Boreal "islands," widely separated each from the other by broad expanses of intervening territory, usually of a lower zone. Through these subspecies variation can be traced that is just as gradual and just as continuous as in the Unalascensis group. Briefly, in the Schistacea group there are two lines of variants, one a series of relatively brownish colored forms, the other, of grayish colored ones. In the first line, beginning with the subspecies *schistacea*—a brown-colored, small-billed race with tail of medium length—a series of steps may be traced through geographically adjacent forms, culminating in the similarly brown-colored, but enormously large-billed and short-tailed subspecies, *brevicauda*. The second series of variants begins with *canescens*—color gray, bill small, tail of medium length—and ends in the gray-colored, huge-billed and long-tailed subspecies, *stephensi*.

Each subspecies of the Schistacea group appears to be circumscribed in its distribution by physical limitations to territory suitable to fox sparrows; the different races are separated by the intervention of unsuitable life zones. Specimens occur showing intergradation between the forms, but, apparently, in no case is there continuous distribution such as seems to obtain on the northwest coast. The point to be emphasized here, however, is that while the different sub-

species are separated by physical conditions, the range of some one subspecies is, in many instances, again broken up into several disconnected areas, these separated as widely as, or even more widely than, those of perfectly distinct forms. Variation is regular and definite; it follows certain lines of development in certain directions; in every case where boundaries between subspecies exist and an obvious change in the characters of the birds takes place, there is a gap in distribution. Separation into subspecies, however, does *not* occur in every case where there is such a gap in distribution.

To summarize: We find in the fox sparrows of the northwest coast, a definite line of variation, with, at intervals, the abrupt accentuation of certain features serving to typify the several subspecies, this condition occurring over a region where circumstances permit the continuous distribution of these birds. In the mountains of western North America we find, in the fox sparrows of the Schistacea group, exactly similar lines of variation, again abruptly accentuated at intervals into what we designate as subspecies, but occurring over a region where the birds exist in more or less widely separated aggregations.

It would seem that the factors governing variation in this group of birds acted to some extent independently of the circumstances by which colonies are isolated at various points within the general range. Information is lacking as to the exact nature of the boundaries between several of the forms of the Schistacea group, but we do know of wide gaps in distribution within the range of several of these subspecies. It is a remarkable fact, and one that is worth dwelling upon, that where there is a continuous trend of variation there is little change within the geographical limits of each form. To take as a concrete example such a trend as extends from northeast to southwest in the *canescens-monoensis-mariposae-stephensi* line of subspecies, once *stephensi* is reached, after a brief step from *mariposae*, there is no further change. *Stephensi* from the northern extreme of its range is practically identical with *stephensi* from the southern extreme, despite the disconnected nature of its habitat, and the enormous gaps between the several colonies. This, to a greater or less extent, is what appears to occur in each subspecies. There are narrow areas of intergradation with much more extensive areas of stability of characters, each change, however, from one form to another being part of a general trend.

With the above points in mind we can now turn to a general consideration of the genus. In the *Iliaca* group are *iliaca* and *atti-*

vagans, alike in their relatively bright coloration and in proportions. *Iliaca* is by far the most widely distributed of the fox sparrow subspecies. Its breeding range extends from Newfoundland to western Alaska, and while certain slight average color differences have been pointed out between eastern and western birds, these have not as yet been demonstrated as of sufficient importance or uniformity to warrant nomenclatural recognition (see Ridgway, 1901, page 387, footnote). The eastern fox sparrow (*P. i. iliaca*) is in life a rather plump bird of "chunky" appearance. The tail is shorter than the wing, and the coloration is of strongly contrasting reds and grays. It is the most brightly colored of any of the races. The bill is typically Fringilline in character, and of moderate size—an average sparrow bill, lacking the excessive development seen in certain extremely large-billed and extremely small-billed southwestern races of the species.

In *altivagans* is illustrated a step from the *Iliaca* toward the *Schistacea* group. As seen in its relatively heavy bill, foxy coloration, and proportionate lengths of wing and tail, *altivagans* evidently belongs within the former aggregation, but, compared with *iliaca*, this subspecies shows a diminution in general size as well as in the bill, a sobering of bright hues, and a lengthening of the tail, all clearly in the direction of *schistacea*.

The Unalascensis group contains the subspecies *unalaschcensis*, *insularis*, *sinuosa*, *annectens*, *townsendi*, and *fuliginosa*, distributed along the northwest coast from the Alaska Peninsula to Puget Sound, and apparently restricted to the immediate vicinity of the mainland coast and the adjacent islands. In this group general build and ratio of wing to tail are about the same as in the *Iliaca* group, but coloration is very different. As is the case with other variable bird and mammal species in the same general region, dark brown tones predominate, and the grays are reduced to a minimum. Color variation within the group ranges consistently from one extreme to another in exact accordance with the geographic position of the several races. At the north is *unalaschcensis*, the least brown of any of the coast subspecies, while the other races to the southward illustrate successive steps in the deepening of this color, culminating in the extremely dark brown "sooty" fox sparrow of the Puget Sound region.

In connection with the coloration of the fox sparrows of the northwest coast (the Unalascensis group) a point worthy of consideration arises. All six of the subspecies involved are heavily marked and noticeably brownish in coloration. This is a peculiarity that is shared

to a greater or less degree by most of the animal species of the same general region, and students of animal variation have come to regard this tendency to dark colors as a result of the excessive humidity of the surroundings. General correlation of the two is obvious. However, the whole of the region involved is not uniform in degree of humidity; neither are the several races of *Passerella* uniform in coloration. There is in the several subspecies, as we have seen, progressive darkening from a relatively grayish bird (*unalaschcensis*) to one of extremely dark brown coloration (*fuliginosa*). The darkening in color, however, does not coincide with increase of humidity in the territory occupied; at least—and this is the important fact—in that occupied by these birds during the breeding season.

It is a general assumption that the conditions prevailing in the summer home, not in the winter habitat, stamp the character of a variable and migratory species, such as is here considered, but the observed facts concerning these races of *Passerella* will bear a different interpretation. *Sinuosa*, one of the three paler colored subspecies, inhabits a region that is, in part at least, of as great humidity as the habitat of *townsendi*, a darker colored form. *Fuliginosa*, nesting under much less humid conditions than *townsendi*, is of still darker coloration. Thus the appearance of these birds seems in flat contradiction to the correlation we have traced between humidity and color.

If, however, we do not insist upon conditions in the summer home as the only ones of importance the apparent discrepancies may be reconciled. In the three northern subspecies (*unalaschcensis*, *insularis* and *sinuosa*), the paler colored forms, the summer habitat is in part a region of exceedingly heavy rainfall, and in general one where heavy fogs and cloudy weather prevail during much of the time. It is a region of great humidity. The subspecies concerned, however, migrate far to the southward, and spend the winter amid relatively arid surroundings. Of the summer habitat of the three southern subspecies (*annectens*, *townsendi*, and *fuliginosa*), the darker colored forms, the most humid region includes most of the range of *townsendi*. *Fuliginosa*, still darker colored, spends the summer in much more dry and sunny surroundings. These three subspecies do not travel so far southward in winter as do the northern forms, and they all (*annectens*, *townsendi* and *fuliginosa*) winter within the humid coast belt. They spend the winter months in a region where this period of the year constitutes the "rainy season," where the precipitation is much greater, and cloudy and foggy weather much more prevalent, than

in the winter home of the northern forms. *Fuliginosa* (the darkest colored subspecies) migrates the least of any, probably occurring throughout the year in the same general region as that in which it nests. Its habitat is in part a region where there is a tremendous annual rainfall, but 80 per cent of this precipitation occurs during the winter months. The summers are to a great extent hot, dry, and sunny, with but occasional rainstorms.

Taking the whole year through, it is evident that the darkest colored forms (*annectens*, *townsendi* and *fuliginosa*) are under more or less humid conditions continuously, and during the winter months under an extreme of such exposure. Of the paler colored races (*unalaschcensis*, *insularis* and *sinuosa*), one at least (*sinuosa*) nests in a region of extremely heavy precipitation, and the others where fogs and cloudy weather prevail much of the time, but they all spend the winter, a longer period than the nesting season, in an arid portion of the country.

Thus, to summarize, while the maximum of humidity in summer lies in the stretch of country extending from Prince William Sound through the Alexander Archipelago, the extreme of dark brown coloration in *Passerella* occurs, not in this region, but to the southward, about Puget Sound. The curious feature of the whole case is that if humidity throughout the year were really the controlling factor in the coloration of these birds, the balanced effects of summer and winter surroundings should have produced such a nicely graded series of steps in the color changes from one extreme to the other, from *unalaschcensis* to *fuliginosa*. There would seem to be an opening here for arguments favoring a pre-determined line of evolution—as regards direction through space, however, rather than through time, the manner in which such a theory is generally applied.

In connection with the above argument attention may be directed to the song sparrow (*Melospiza melodia*), as it occurs on the north Pacific coast. Different subspecies correspond closely in habitat with the several subspecies of *Passerella*, and exhibit the same general trend of color variation as is seen in the latter. In *Melospiza*, however, while the extreme of dark reddish brown coloration does occur in the Puget Sound region (the habitat of *fuliginosa*), this coloration is practically the same as in the bird of the Sitkan district. The northwest coast song sparrows are so much less migratory than the fox sparrows that it is hard to draw comparisons regarding the relative effect of summer conditions as opposed to conditions throughout the

year. The Puget Sound song sparrow, however, is about as sedentary as the fox sparrow of the same region, and, existing as it does under the same conditions throughout the year, it is hard to see why it should not have assumed comparable coloration.*

The Unalascensis group exhibits some variation in size and shape of bill, though very little in comparison with the diversity shown in the Schistacea group. At the northern extreme is *unalascensis*, a relatively large-billed form, to the southward, in *sinuosa*, the bill is smaller and slenderer, and at the southern extreme, in *townsendi* and *fuliginosa*, it becomes still smaller, and more stubby.

There is, in all likelihood, continuous, or nearly continuous, distribution of fox sparrows along the entire northwest coast, but the breeding range of the Unalascensis group as a whole appears to be almost entirely separated from the ranges of the Iliaca and Schistacea groups. At any rate, with the exception of one small series, there are no breeding birds now available from intermediate stations. According to Osgood (1904, p. 76), *iliaca* and *unalascensis* breed within one hundred miles of each other at points near the base of the Alaska Peninsula, the former at Nushagak, the latter at Lake Iliamna, each in typical form. In the country between these two places there is stated to be "no physical barrier and no appreciable difference in temperature or environment" (Osgood, *loc. cit.*), and a strong argument is presented in favor of the specific distinction of the two forms. Such a conclusion, however, is premature in the absence of information relative to conditions elsewhere along the boundary line between the *iliaca* and *unalascensis* groups. Numerous intergrades have been taken in winter in California, as mentioned by Osgood. Many examples of these have been available in the present study, and they are not of a nature to favor the theory of their being hybrids.

As far as is known there is an absolute hiatus between the breeding ground of the southernmost of the Unalascensis group, *fuliginosa* of the Puget Sound region in Washington, and the northernmost of the Schistacea group, *fulva* in central Oregon and *schistacea* (presumably) in eastern Washington. Neither is any evidence of intergradation apparent at these points, the most that can be said being that

* The data for the above comments were derived partly from personal experience of the writer in the Sitkan district and on Vancouver Island, partly from information obtained from Mr. Joseph Dixon, economic mammalogist of this museum, regarding conditions at Prince William Sound, Kadiak Island, the Alaska Peninsula, and Unalaska, and partly from weather reports kindly supplied me by Mr. E. A. Beals, U. S. Weather Bureau, San Francisco.

those forms of the Schistacea group that most nearly approach the Unalascensis group are distinctly browner of coloration than the more southern subspecies. It seems probable that while the habitats of these unlike forms approach one another somewhat closely at certain extreme outposts, these several points are termini of lines whose beginnings lie far apart, lines which have approached this meeting ground from different directions. On the whole it may be admitted that the three groups within the species *Passerella iliaca*, the Iliaca, Unalascensis and Schistacea groups of subspecies, are quite sharply differentiated. Within each group the several subspecies grade from one to another by variation so continuous that it is frequently extremely difficult to draw differentiating lines. As regards each aggregation, between Iliaca and Unalascensis, Iliaca and Schistacea, or Unalascensis and Schistacea, there are (except for one limited series [see p. 123]) no breeding birds at hand demonstrating intergradation. There are, however, certain facts pointing definitely to the existence of such intergradation. *Altvigans* is undoubtedly a step from *iliaca* toward *schistacea*, and it comes from just the region where such variation should occur. There are winter birds at hand that are unmistakably intermediate in appearance between the several groups. Also, a most important consideration, the stretch of country between the known boundaries of the subspecies of the Iliaca group, the Unalascensis group, and the Schistacea group, includes just the region where no intensive bird collecting has been done, where we have no knowledge whatever of the breeding fox sparrow population. So altogether it seems safe to say that, admitting the much sharper differentiation existing between the several groups, as compared with the closer connection of the several subspecies of each aggregation, all the races should still be regarded as variants of one species, and not of three.

In the Schistacea group are found the "slate-colored" and "thick-billed" sparrows, so called, the subspecies *schistacea*, *fulva*, *megarhynchus*, *brevicauda*, *canescens*, *monoensis*, *mariposae*, and *stephensi*. This group is more widely different from the Iliaca and Unalascensis groups than these are from one another, and there is also greater divergence between subspecies within the group than there is in either of the other aggregations.

These birds are not so plump and rounded in appearance as are the northwest coast and eastern subspecies. Tail is longer than wing,

which adds to the generally slenderer appearance, and several of the Schistacea subspecies are actually of smaller size and lighter build than the races forming the other groups.

Here coloration is relatively uniform, the gray hues predominating and the browns at a minimum. The greatest variation lies in the size and shape of the bill, one extreme in the small-billed *canescens*, the other in the large-billed *stephensi*. It should be pointed out here that the "tooth" that is frequently seen upon the upper mandible of birds of the Schistacea group is of no diagnostic value. It appears indifferently in any of the subspecies, though mostly in those with the larger bills, and is developed to a varying degree, apparently as a peculiarity of the individual.

It is not possible in this aggregation of subspecies, to trace any such simple and direct line of variation as occurs in the Unalascensis group, where the linear arrangement of subspecies, north and south, accords precisely with the development of the several variable characters observed. In the Schistacea group the problem is much more involved, and it is possible to trace different lines of development as different directions are followed (see fig. D).

In *altivagans* is seen a link between *iliaca*, which is among the largest of the fox sparrows, of bright colors, and with fairly large bill, and *schistacea*, of small general size, dull colors, and with decidedly small bill. *Schistacea*, despite its name, is slate-colored only in comparison with the *Iliaca* and *Unalascensis* fox sparrows. It is among the brownest of the Schistacea group. Westward and southward from the Great Basin, the habitat of *schistacea*, two lines of variation may be followed, in both of which there is similarity in development of the bill, while there are differences in color and proportions. Southwest of the habitat of the small-billed and relatively brown-colored *schistacea* lie the White Mountains, with the subspecies *canescens*, also small-billed, but extremely gray in coloration. West and south of this race lie in succession the gray-colored forms *monoensis*, *mariposae*, and *stephensi*, progressively large-billed, a tendency culminating in the enormous development of the bill seen in *stephensi*, of the southern Sierra Nevada and the Boreal mountain tops of extreme southern California (see fig. E). Besides the gray coloration of these races they are further distinguished by greater length of tail.

In the forms occurring in southern Oregon and northern California another, somewhat similar line of development can be followed. Starting again with the small-billed *schistacea* of the mountains of



Fig. D. Map of California and portions of Oregon and Nevada, showing, by conventionalized drawings of heads, the varying development of the bill in the subspecies breeding in the region. The position of the figures indicates approximately the summer habitat of each of the several forms. *a*, *schistacea*; *b*, *fulva*; *c*, *brevicauda*; *d*, *canescens*; *e*, *monoensis*; *f*, *mariposae*; *g*, *stephensi*.

northern Nevada, and going westward, there can be traced through *fulva*, of southern Oregon and of the Warner Mountains of extreme northeastern California, an increase in bulk of bill and a deepening of the brown coloration, both tendencies culminating in the large-billed *brevicauda* of the Yolla Bolly Mountains, which latter is geographically also at the end of the series (see fig. F'). The development of the bill in this chain is similar to that seen in the *canescens-monoensis-mariposae-stephensi* series, but the brown coloration is quite different, as is also the ratio of tail to wing. A large-billed race, *stephensi*, at the end of one line of variants, possesses an extremely long tail and

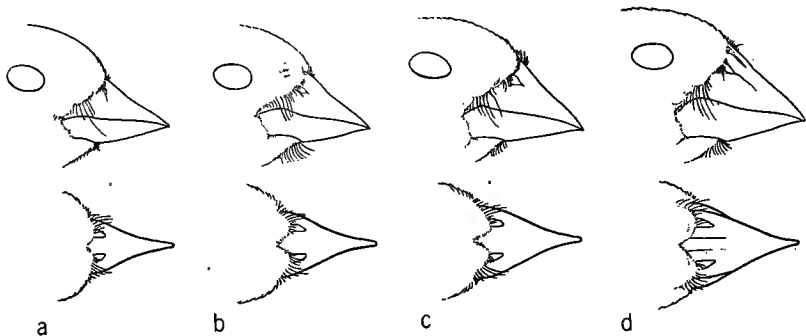


Fig. E. Bills of four subspecies of fox sparrow of the Schistaceae group, showing the trend of variation in this member in the four contiguous races extending from northern Nevada (*schistacea*) through the Mono Lake region (*monoensis*) and the west slope of the central Sierra Nevada (*mariposae*) to southern California (*stephensi*); natural size.

a. *Passerella iliaca schistacea*, adult male; no. 9055; Mus. Vert. Zool.; Pine Forest Mountains, Nevada; June 24, 1909.

b. *Passerella iliaca monoensis*, adult male; no. 26930; Mus. Vert. Zool.; type specimen; Mono Lake Post Office, Mono County, California; May 21, 1916.

c. *Passerella iliaca mariposae*, adult male; no. 25693, Mus. Vert. Zool., type specimen; Chinquapin, Yosemite National Park, California; June 10, 1915.

d. *Passerella iliaca stephensi*, adult male; no. 20505, Mus. Vert. Zool.; Taylor Meadow, Sierra Nevada, Tulare County, California; July 19, 1911.

grayish coloration; a large-billed race at the end of another chain, *brevicauda*, is relatively short-tailed and of a brown tone of coloration.

It will be observed in the distribution of the several subspecies in California, Nevada, and Oregon, that geographic position accords so exactly with the nature and extent of development of the various features of the races, that the changes of character can be traced from one extreme to the opposite by a series of steps going either from north to south or from east to west. Which of these lines, if either, is indicative of the course actually followed by the species in the original settlement of its present habitat is not evident. Since *Passerella iliaca* is a Boreal species it is probably safe to assume that the general trend

was from north to south. The north and south lines of development, approximately parallel, seen in the distribution of the subspecies of the Schistacea group may have resulted from a fan-like dispersal from a common center along favorable lines on the Sierra Nevada and adjacent mountain ranges. That there is an apparently comparable chain of variants stretching at right angles, from east to west, may be entirely fortuitous, the several links being really unconnected, genetically, but merely representing comparable degrees of evolution in the two north and south lines. Similarly, local dispersals from points along these lines may enter into the problem.

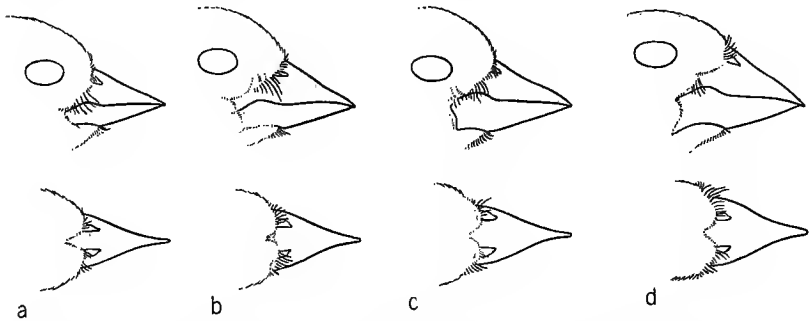


Fig. F. Bills of four subspecies of fox sparrow of the Schistacea group, showing the trend of variation in this member in the four contiguous races extending from northern Nevada (*schistacea*), through northeastern California (*fulva*) and the Mount Shasta region (*mariposae*) to the inner coast ranges of northern California (*brevicauda*); natural size.

a. *Passerella iliaca schistacea*, adult male; no. 9054; Mus. Vert. Zool.; Pine Forest Mountains, Nevada; June 19, 1909.

b. *Passerella iliaca fulva*, adult male; no. 14800, Mus. Vert. Zool.; Sugar Hill, Modoc County, California; May 30, 1910.

c. *Passerella iliaca mariposae*, adult male; no. 29089, Mus. Vert. Zool.; Sisson, Siskiyou County, California; May 15, 1918.

d. *Passerella iliaca brevicauda*, adult male; no. 23922, Mus. Vert. Zool.; South Yolla Bolly Mountain, Tehama County, California; August 1, 1913.

DISTRIBUTION AND MIGRATION

Differentiation of the Iliaca, Unalascensis and Schistacea groups may be assumed to date back to the period when the first two retired northward in the wake of the retreating ice fields at the close of glacial times, and the last became stranded upon the mountain tops of the southland. While differentiation into the three general types may be admitted as having conceivably arisen in this way, it would seem that the variation within each group must be due to some other cause or causes. It is as though we were contemplating three *species* (the groups Iliaca, Unalascensis and Schistacea), each group owing

its origin to one set of causes, and its subsequent development to quite different factors, which produced the several subspecies now seen in each group.

There is food for thought in the subspecific variation seen in *Passerella*, considered in relation to the complicated migratory movements performed by the several subspecies. It is hard to reconcile the observed conditions with any of the proposed theories regarding the origin of bird migration. I am not sure that there is another instance known among birds duplicating the migrations of the several subspecies of the *Unalaschcensis* group of fox sparrows. There are cases where one migratory subspecies passes completely over the range of another, closely related but more sedentary in its habits, but the yearly shifting of the *Unalaschcensis* subspecies is much more complicated, as herein shown (see map, fig. H).

Assuming that the north and south migrations of birds are habits resulting from an originally short, involuntary retreat as advancing Arctic conditions first produced seasonal changes where the semi-tropical climate of pre-Glacial times had previously obtained, this followed by a subsequent return as a milder climate again prevailed—a theory commonly advanced in explanation of migration—it is still hard to understand how the results we now see could have followed in such case. It is conceivable, however, that the diverse migrations of the different subspecies now seen on the Pacific coast developed after the establishment of an originally simple north and south movement similar to that now followed by *iliaca*. Such an hypothesis would imply a change of topography and climate in the region occupied, to which the southernmost birds gradually adapted themselves. Whether or not the geological history of the Pacific coast of North America lends support to this idea I do not know. The supposition is of further interest in its bearing upon the question discussed elsewhere in this paper (see pp. 93–96) as to the possibility of subspecific characters being fixed by conditions in the winter as well as in the summer habitat, for this would imply the establishment of the migratory habit prior to the appearance of the physical characteristics now seen in the different forms.

As regards the subspecies of the *Schistacea* group, the assumption is that these birds occupy their present high mountain summer habitats as refuges to which they retreated with the advent of a warmer epoch, prior to which they had occupied the adjacent valleys. This being the case, why should not the winter migration be simply back to these

same valleys? Why should the birds of one mountain retire in winter to far distant valleys and foothills, while a closely related subspecies moves in from a remote mountain habitat to occupy the valley and foothills most nearly adjacent to the summer home of the first mentioned race? We know that this happens, but it is hard to conceive of circumstances whereby such results are brought about.

The species *Passerella iliaca* is restricted to North America, and is practically confined to that part of North America that lies north of the United States-Mexico boundary line. I have, in fact, seen but one published reference to the occurrence of the species south of that line, a record for Guadalupe Island, Lower California (Bryant, 1887, p. 303). *Passerella iliaca* occurs in summer over a large part of Boreal North America, extending from Newfoundland west across northern Canada to western Alaska, and south on the summits of the Rocky Mountains, the Sierra Nevada and the Coast Ranges, to Colorado, Nevada, and southern California. The breeding area occupied by the subspecies *Passerella iliaca iliaca* is mainly in the Hudsonian zone. The western subspecies are mostly in the Canadian, the races occurring in the mountains of California being markedly restricted within the limits of this zone. Where the Hudsonian and Canadian zones extend over vast distances uninterruptedly, as in northern Canada and the Pacific coast region of Alaska, there is probably nearly or quite uniform distribution of *Passerella* also, either with no differentiation into distinguishable local races, as in the wide-ranging *Passerella iliaca iliaca*, or else with gradual change by a series of steps from one extreme to another, as is seen on the coast of Alaska. In the latter case there are apparently other variable conditions which constitute influencing factors within the limits of the zones inhabited.

In the western mountains the Canadian zone extends southward at increasingly higher altitudes and in constantly diminishing area; *Passerella* accompanies this zone nearly or quite to its southern extremity, but its colonies are naturally more and more widely separated and of lesser extent as the southernmost limits of the zone are approached. These scattered breeding colonies are not necessarily of distinguishable subspecies in every case, however, definitely isolated though each may be. In some instances a distance of but a relatively few miles of lower zones serves as a boundary between subspecies that are widely different in appearance, as is the case with *canescens* and *mariposae*; while again one subspecies may extend over a series of disconnected Canadian zone islands, with no appreciable change in

appearance, as is the case with *stephensi*. From these facts it is obvious that insularity alone can not be invoked as an explanation of the development of the different forms. It should be noted in this connection that while discontinuous distribution of a subspecies occurs

CROSS-SECTIONAL PROFILES OF CALIFORNIA

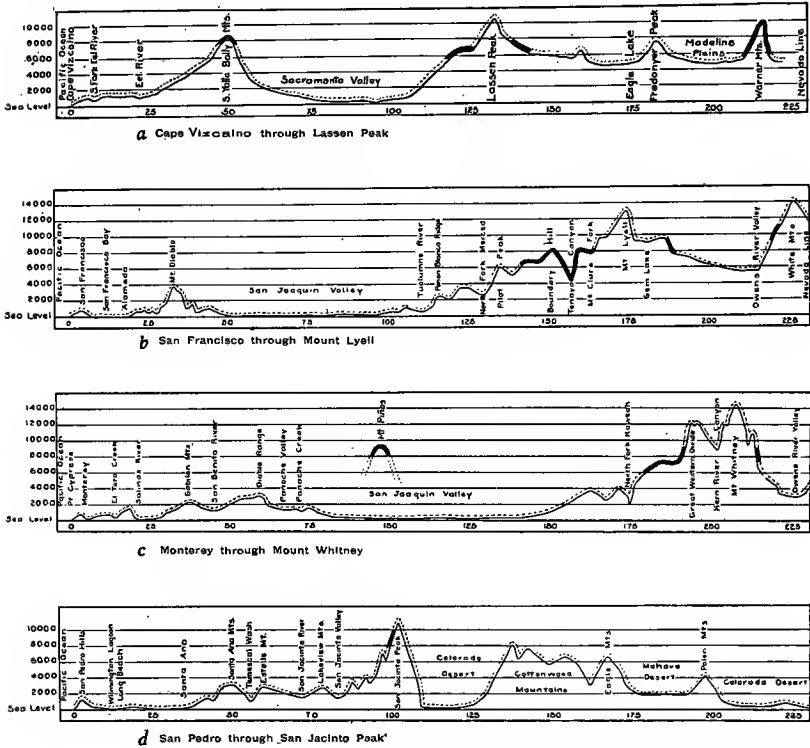


Fig. G. Four cross-sectional profiles of California. The shaded areas indicate the altitudinal distribution in summer of the subspecies of fox sparrow occurring within the state at that season.

a. *Brevicauda* on the Yolla Bolly Mountains; *mariposae* on Lassen Peak; *fulva* on the Warner Mountains.

b. *Mariposae* on the Sierra Nevada west of Mount Lyell; *monoensis* in the Mono Lake region on the east slope of the Sierra Nevada; *canescens* on the White Mountains.

c. *Stephensi* on Mount Piños and on the Sierra Nevada west of Mount Whitney; *mariposae* on the Sierra Nevada east of Mount Whitney.

d. *Stephensi* on San Jacinto Peak.

through the interpolation of unsuitable territory, it never takes place through the interpolation of another race of fox sparrow. Regarding each isolated colony as a separate race (as in a sense they are, of course, though we can not always distinguish between them), and it is evident that any one line of variation extends continuously in a

given direction, but that appreciable changes in appearance do not occur wherever there is discontinuity of range.

Passerella is closely related to *Melospiza*. Fox sparrows are very like song sparrows, in structure, appearance, habits, and actions. The respective ranges also of *Passerella iliaca* and *Melospiza melodia* are suggestive of rather close relationship between the two, for their habitats are in a measure complementary since the two species, though frequently occurring in the same general regions, occupy different life zones. *Passerella* is mostly in the Boreal zone, descending occasionally into high Transition, *Melospiza* mostly in the Sonoran zones, though some races ascend to Transition and higher. On the coast of Alaska, at the northern extreme of the range of *Melospiza*, the general separation of the two does not hold, neither Sonoran nor Transition extending this far north, but at the latitude of Vancouver Island we find the birds thus separated, *Passerella* on the Boreal mountain tops, and *Melospiza* in the Transition zone valleys.

All of the races of *Passerella iliaca* are migratory. Some are much more so than others, and in a general way it may be said that the subspecies breeding farthest north migrate farthest south.

Passerella iliaca iliaca winters far south of its Boreal nesting grounds, concentrating into a relatively limited area in the South Atlantic and Gulf states. Thus the lines of migration in this subspecies converge, birds from Labrador and Newfoundland traveling southwest and those from Alaska and Mackenzie southeast, toward their common winter home.

Birds of the Unalascensis group move directly southward along the Pacific coast, each into a more or less definitely circumscribed winter habitat. The six subspecies of this group are arranged in summer, from north to south (from the Alaska Peninsula to Puget Sound) in the following order: *unalaschensis*, *insularis*, *sinuosa*, *annectens*, *townsendi*, *fuliginosa*. The subspecies breeding at the northern extreme, *unalaschensis*, *insularis* and *sinuosa*, move the farthest south in winter, passing completely over both summer and winter habitats of *annectens*, *townsendi* and *fuliginosa*, and reaching the extreme southern limits of California. *Annectens* winters mainly on the coast of California in the Santa Cruz and San Francisco Bay regions, passing over the habitats of *townsendi* and *fuliginosa* to reach this destination. *Townsendi* in turn leap-frogs over *fuliginosa* and winters in numbers as far south as Humboldt Bay, California. *Fuliginosa* hardly migrates at all. Occasional stragglers reach San

Francisco Bay and a few more winter in the Humboldt Bay region, but the main winter home of this subspecies certainly lies north of the latter point. Undoubtedly, however, it performs an altitudinal migration, moving down from the mountain tops which constitute its summer home, as on Vancouver Island. (See fig. H.)

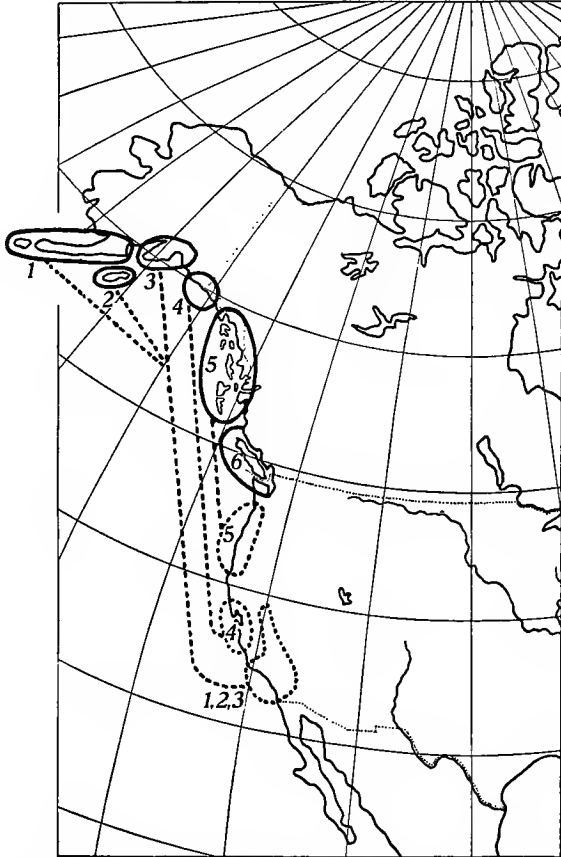


Fig. H. Map showing in somewhat conventionalized form the nature of the migrations performed by the subspecies of the *Unalascensis* group. 1, *unalascensis*; 2, *insularis*; 3, *sinuosa*; 4, *annectens*; 5, *townsendi*; 6, *fuliginosa*. A solid line surrounds the summer habitat; a dotted line surrounds the main winter habitat. The broken lines connecting summer and winter habitats do not necessarily indicate migration routes; they are inserted to emphasize the overlapping feature in the seasonal movements. The subspecies occupying the northernmost summer habitats (*unalascensis*, *insularis*, and *sinuosa*) travel the farthest south. The subspecies occupying the southernmost summer habitat (*fuliginosa*) is practically resident there.

As bearing upon the manner in which these birds migrate, certain facts gathered during several seasons of field work carried on by the California Museum of Vertebrate Zoology on the coast of Alaska and

British Columbia are worthy of record, indicating a striking absence of migrants representing subspecies that might be supposed to occur commonly. An expedition to the Prince William Sound region, Alaska, covering the migration period in part at least, took no specimens of *Passerella* other than the breeding form, *sinuosa*. Of two expeditions to the Sitkan district, Alaska, each one covering nearly the entire migration period, both spring and fall, one collected nothing but the breeding fox sparrow, *townsendi*, the other secured, besides an abundance of *townsendi*, a single migrating individual of another race, *insularis*. An expedition to Vancouver Island, covering both spring and fall migration, secured, besides the breeding *fuliginosa*, one migrating individual of *insularis* and three of *townsendi*. I have at hand, however, two specimens of *unalaschcensis* taken at Ketchikan, on the coast of southeastern Alaska, April 12 and 15, 1916, migrating birds, of course, and proof that some individuals, at least, do pass through this region. On the whole, however, it seems probable that these northern Alaskan fox sparrows do not as a rule travel southward by slow stages, passing continuously through the regions directly south of their breeding homes, but rather that departure is made abruptly and by long flights to distant destinations. It may very well be that *unalaschcensis*, *insularis*, and *sinuosa*, with their summer habitats lying so far to the westward, fly southeast over the open ocean for a long distance, the main body of the travelers not reaching the North American mainland until at about the northern boundary of the United States.

In the above connection it may be noted that the one migrating example of *insularis* just referred to as having been collected in the Sitkan district, Alaska, was taken on Kuiu, one of the westernmost islands of the region, and a station where there was also found migrating the Aleutian Savannah sparrow (*Passerculus sandwichensis sandwichensis*), whose summer home lies in the same general region as this fox sparrow.

In the Schistacea group the winter migration involves a moving down from the high mountains, but there is a decided southward passage also. The lines of travel and the respective winter habitats of the several subspecies are not so well understood as is the case in the other groups; although the material at hand for the present study serves to explain some of the questions involved, there is need of further collecting of specimens and observation of migration at many points.

The winter habitats of certain subspecies are still practically unknown, the few winter specimens that have been collected being undoubtedly stragglers from the centers of abundance. Details of distribution are given elsewhere in this paper, under each of the subspecies, but the nature of the several problems may be briefly touched upon here. The winter homes of *fulva* and *canescens* are still practically unknown. *Megarhynchus* appears in numbers in winter in southern California from an unknown breeding ground. *Stephensi* in departing from its summer habitat in the Sierra Nevada and the higher mountains of southern California does not visit the adjacent valleys, either as a transient or as a winter visitant. It leaves the region absolutely, in a similar manner to the Green-tailed Towhee (*Oreospiza chlorura*) and the Wright Flycatcher (*Empidonax wrighti*) of the same habitat. The latter two species, however, are known as migrants to the southeast, while the route and destination of *stephensi*, are facts that are still hidden.

The manner in which *megarhynchus*, *mariposae*, and *brevicauda* are distributed locally in southern California in winter suggests that the winter homes of the other subspecies may be found by further exploring at the proper season those regions whose winter avifaunas are still but slightly known. It may be pointed out, as regards the mountain ranges of southern California, that while we are well acquainted with the summer birds, there are but one or two points where winter collecting or observations have been carried on at all extensively. Judging from the local distribution in winter of certain of the subspecies of *Passerella*, it may well be that those races whose winter homes are not known are just as definitely delimited, but in sections from which reports covering the proper season are lacking.

The accompanying charts (tables 1, 2) are designed to show the winter distribution of the subspecies of *Passerella* in California. Under each of the several faunal areas are entered the number of specimens examined of each subspecies, taken within the specified areas between October 15 and April 15, and also the percentage of the total *Passerella* winter population that is formed by each subspecies. The restriction between limited dates is not quite fair, as it throws out a number of specimens of the more southerly wintering subspecies, taken unquestionably in their winter habitats, but some such arbitrary rule seemed necessary to allow for the presence of migrating individuals in the more northern parts of the state. It is also possible that October 15 is a little too early a date to insure the presence of a bird in its winter home in all cases.

TABLE 1.—Manner of occurrence in winter of the subspecies of *Passerella iliaca* in the different faunal areas of California. Specimens listed were taken between October 15 and March 15. The figures in the body of the table indicate the number of each subspecies in each faunal area. Column at extreme right indicates total number of specimens of each subspecies. Bottom row of figures indicates number of specimens of all subspecies from each faunal area.

| | Trinity Mountains | Sierra Nevada (north) | Sierra Nevada (south) | Sierra Foothill | N. Humid Coast (Humboldt section) | N. Humid Coast (Marin section) | Santa Cruz | San Francisco Bay | Sacramento Valley | Clear Lake | San Joaquin | San Diego | Santa Barbara Ids. | Colorado Desert | |
|---------------------------------|-------------------|-----------------------|-----------------------|-----------------|-----------------------------------|--------------------------------|------------|-------------------|-------------------|------------|-------------|-----------|--------------------|-----------------|-----|
| <i>P. i. iliaca</i> | ... | 3 | 2 | 4 | ... | 2 | 2 | 1 | ... | ... | ... | 7 | ... | ... | 12 |
| <i>P. i. altivagans</i> | ... | 3 | 2 | 4 | ... | 1 | 1 | 3 | ... | ... | ... | 32 | ... | ... | 46 |
| <i>P. i. unalascensis</i> | 1 | 2 | 8 | 3 | ... | ... | ... | 2 | ... | 1 | 1 | 36 | 2 | ... | 56 |
| <i>P. i. insularis</i> | ... | 3 | 4 | ... | ... | 10 | 3 | 10 | 1 | 3 | ... | 25 | 1 | ... | 60 |
| <i>P. i. sinuosa</i> | 1 | 12 | 13 | ... | ... | 6 | 28 | 15 | 4 | 4 | 3 | 124 | 3 | ... | 213 |
| <i>P. i. annectens</i> | 1 | ... | ... | ... | ... | 28 | 54 | 27 | ... | ... | 1 | 16 | ... | ... | 127 |
| <i>P. i. townsendi</i> | ... | ... | ... | ... | 40 | 4 | 1 | 4 | ... | ... | ... | ... | ... | ... | 49 |
| <i>P. i. fuliginosa</i> | ... | ... | ... | ... | 6 | ... | ... | 9 | ... | ... | ... | 1 | ... | ... | 16 |
| <i>P. i. schistacea</i> | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 14 | ... | ... | 15 |
| <i>P. i. fulva</i> | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | 4 |
| <i>P. i. megarhynchus</i> | 3 | 1 | 1 | ... | ... | 1 | 1 | ... | ... | 1 | ... | 82 | 2 | ... | 92 |
| <i>P. i. brevicauda</i> | ... | ... | ... | ... | ... | 11 | ... | ... | ... | ... | ... | 24 | 3 | ... | 38 |
| <i>P. i. canescens</i> | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 | ... | 1 | 9 |
| <i>P. i. monoensis</i> | ... | ... | ... | 8 | ... | ... | ... | ... | ... | ... | ... | 11 | 1 | ... | 20 |
| <i>P. i. mariposae</i> | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 8 | ... | ... | 9 |
| <i>P. i. stephensi</i> | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | 4 |
| Totals..... | 6 | 21 | 28 | 17 | 46 | 63 | 90 | 71 | 5 | 9 | 5 | 396 | 12 | 1 | 770 |

TABLE 2.—Manner of occurrence in winter of the subspecies of *Passerella iliaca* in the different faunal areas of California; based upon the same specimens as those listed in Table 1. The figures indicate the percentage of the *Passerella* population of each faunal area that is formed by the indicated subspecies.

| | Trinity Mountains | Sierra Nevada (north) | Sierra Nevada (south) | Sierra Foothill | N. Humid Coast (Humboldt section) | N. Humid Coast (Marin section) | Santa Cruz | San Francisco Bay | Sacramento Valley | Clear Lake | San Joaquin | San Diego | Santa Barbara Ids. | Colorado Desert |
|---------------------------------|-------------------|-----------------------|-----------------------|-----------------|-----------------------------------|--------------------------------|------------|-------------------|-------------------|------------|-------------|-----------|--------------------|-----------------|
| <i>P. i. iliaca</i> | ... | ... | ... | ... | ... | 3.2 | 2.2 | 1.6 | ... | ... | ... | 1.8 | ... | ... |
| <i>P. i. altivagans</i> | ... | 14.2 | 7.2 | 23.5 | ... | 1.6 | 1.1 | 4.3 | ... | ... | ... | 8.1 | ... | ... |
| <i>P. i. unalascensis</i> | 16.6 | 9.7 | 28.5 | 17.7 | ... | ... | ... | 2.9 | ... | 11.1 | 20 | 9.1 | 16.6 | ... |
| <i>P. i. insularis</i> | ... | 14.2 | 14.3 | ... | ... | 15.8 | 3.3 | 13.3 | 20 | 33.3 | ... | 6.3 | 8.3 | ... |
| <i>P. i. sinuosa</i> | 16.6 | 57 | 46.4 | ... | ... | 9.5 | 31.1 | 21.2 | 80 | 44.4 | 60 | 31.3 | 25 | ... |
| <i>P. i. annectens</i> | 16.6 | ... | ... | ... | ... | 44.4 | 60 | 38.1 | ... | ... | 20 | 4.3 | ... | ... |
| <i>P. i. townsendi</i> | ... | ... | ... | ... | 86.9 | 6.4 | 1.1 | 5.7 | ... | ... | ... | ... | ... | ... |
| <i>P. i. fuliginosa</i> | ... | ... | ... | ... | 13.1 | ... | ... | 12.8 | ... | ... | ... | ... | ... | ... |
| <i>P. i. schistacea</i> | ... | ... | ... | 5.9 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| <i>P. i. fulva</i> | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| <i>P. i. megarhynchus</i> | 50 | 4.8 | 3.6 | ... | ... | 1.6 | 1.1 | ... | ... | 11.1 | ... | 20.9 | 16.6 | ... |
| <i>P. i. brevicauda</i> | ... | ... | ... | ... | ... | 17.5 | ... | ... | ... | ... | ... | 6.1 | 25 | ... |
| <i>P. i. canescens</i> | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2.1 | ... | ... |
| <i>P. i. monoensis</i> | ... | ... | ... | 47 | ... | ... | ... | ... | ... | ... | ... | 2.8 | 8.3 | 100 |
| <i>P. i. mariposae</i> | ... | ... | ... | 5.9 | ... | ... | ... | ... | ... | ... | ... | 2.1 | ... | ... |
| <i>P. i. stephensi</i> | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1.1 | ... | ... |

From certain of the faunal areas the numbers of birds examined were too small for the results to have much significance, but there are certain facts in winter distribution that the chart shows very clearly. Attention may be called to the demonstrated preponderance of *annectens* in the Marin, San Francisco Bay, and Santa Cruz sections, compared with its absence from the Humboldt Bay section directly to the northward, and the limited numbers found elsewhere in the state; the preponderance of *townsendi* in the Humboldt Bay section,

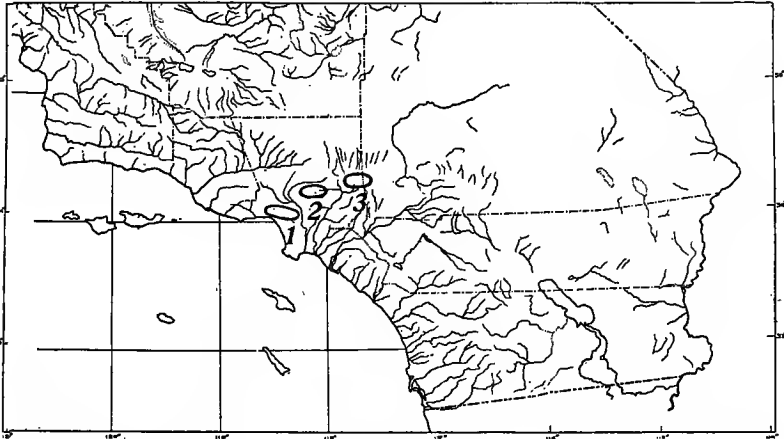


Fig. I. Map of southern California indicating the position of the localities designated in the text as (1) the Santa Monica Mountains region, (2) the Pasadena region, (3) the Claremont region.

and the few individuals taken at other points; and similar restrictions in range shown by certain other subspecies.

From the Sierra Nevada, Humboldt, Marin, Santa Cruz, San Francisco Bay, and San Diego regions, there are sufficient winter specimens to warrant some generalizations. From the San Diego region (with which is included the San Bernardino Mountain region) there are enough birds available to permit of analysis of conditions at several localities within this area, such as can not be done elsewhere in the state. Of the 396 winter collected specimens of *Passerella* from the San Diego region, 326 were taken from three relatively restricted areas, in Los Angeles and San Bernardino counties. These points I have designated as follows (see fig. I): (1) Santa Monica Mountains region (Coldwater Cañon, Franklin Cañon, Hollywood, etc.); (2) Pasadena region (Arroyo Seco, Millard Cañon, Mount Wilson, etc.); (3) Claremont region (San Antonio Cañon, San Dimas Cañon, Lytle

Creek, etc.). Each of these three areas includes places that were favorite collecting grounds of certain persons (Santa Monica Mountains: J. E. Law, L. E. Wyman, W. B. Judson, H. S. Swarth; Pasadena: J. Grinnell, F. S. Daggett, H. S. Swarth; Claremont: W. M. Pierce), and the series of *Passerella* are results of years of collecting at these points. I believe, therefore, that these series may be taken as fairly indicative of average conditions within the areas where they were obtained. As to the characteristics of the three areas, the Santa Monica Mountain region is widely different from the other two, while the Pasadena and Claremont regions are essentially alike. The part of the Santa Monica Mountains that is here included is a spur extending eastward from Santa Monica Cañon about fifteen miles. These hills are low, nowhere reaching an elevation of 2000 feet, densely brush covered, with very little large timber and very little water. The mountains of the Pasadena and Claremont regions are of a different character, much higher and more rugged, with deep cañons containing large streams of water, and with an abundance of timber.

TABLE 3.—Winter distribution of the subspecies of *Passerella iliaca* at three neighboring localities in the San Diego region (see map, fig. 1). Specimens listed were collected between October 15 and March 15.

| | Los Angeles and Santa Monica Mountains | Pasadena and adjacent mountains | Claremont and adjacent mountains |
|-----------------------------------|--|---------------------------------------|--|
| <i>P. i. iliaca</i> | 1 | 2 | 2 |
| <i>P. i. altivagans</i> | 4 | 6 | 17 |
| <i>P. i. unalaschcensis</i> | 2 | 7 | 26 |
| <i>P. i. insularis</i> | 5 | 17 | 1 |
| <i>P. i. sinuosa</i> | 8 | 9 | 83 |
| <i>P. i. annectens</i>..... | .... | 10 | 2 |
| <i>P. i. schistacea</i>..... | .... | 2 | 7 |
| <i>P. i. megarhynchus</i> | 26 | 19 | 26 |
| <i>P. i. brevicauda</i> | 18 | .... | .... |
| <i>P. i. canescens</i>..... | .... | 1 | 6 |
| <i>P. i. monoensis</i>..... | .... | 4 | 7 |
| <i>P. i. mariposae</i> | 2 | 3 | .... |
| <i>P. i. stephensi</i> | 2 | .... | 1 |
| Totals..... | 68 | 80 | 178 |

There are certain features in the distribution of *Passerella* in the three sections that are at once apparent (see table 3): the preponderance of *schistacea* in the Claremont region, the restriction of *brevicauda* to the Santa Monica Mountain region, the scarcity of any subspecies of the Unalaschensis group in the Santa Monica Mountain region, the preponderance of *insularis* in the Pasadena region, and the preponderance of *sinuosa* in the Claremont region.

The figures given for the southern half of the Sierra Nevada and for the Sierra foothill sections are based in part on material secured by expeditions from the California Museum of Vertebrate Zoology into the Yosemite region, covering every month of the year. The results apply only to this limited area, but judging from these figures the subspecies of the *Schistacca* group form but a small part of the winter population of the Sierra Nevada.

I am convinced that there is significance in the results of these tabulations. I believe them to indicate that some forms really have a winter habitat nearly as sharply defined as the summer home, while others show preferences somewhat less marked.

One lesson to be learned from this analysis of winter collections is that inasmuch as the extensive collecting of specimens at certain limited spots has yielded definite knowledge of a sort that obviously could not have been obtained in any other way, similarly extensive collecting at places regarding which we are still very ignorant as to the winter avifauna, may be expected to explain many details of distribution in this group of birds of which at present we have no knowledge. In the writer's opinion, the solution of such complicated questions of relationship and distribution as are presented in the *Passerella* group lies only in the wholesale but intelligently directed collecting of specimens.

In the course of the writer's field experience he has from time to time noted facts in the distribution and migration of fox sparrows, which, disconnected though they be, are set down here as having some bearing on the subject in general. In a number of years of observation about Los Angeles, fox sparrows were found to be extremely rare in the flat valley in which the city is situated, one or two of the *Unalascensis* group, and two *altivagans* being all that were noted, and these at long intervals. In the low foothills of the Santa Monica Mountains, but a few miles away, certain subspecies could be found in fair numbers regularly every winter. This was also the case in the brush of the Arroyo Seco, a stream issuing from the mountains near Pasadena, fox sparrows being seen regularly in winter in the bordering willow thickets, practically as far as the junction of this stream with the Los Angeles River, at the edge of the city.

In years past many southern California valleys were covered with miles of more or less dense chaparral. Much of this land has been cleared for agricultural purposes, but some fairly extensive areas of this nature still remain, the haunts of many typical Californian animal

species. These tracts afford shelter for brush-loving birds, and it might be supposed that they would be occupied by the winter visiting fox sparrows; but such is not the case. In many years experience in such surroundings, while quail shooting and bird collecting, the writer has never seen a fox sparrow thus situated. In southern California fox sparrows in general apparently occur but rarely in the Lower Sonoran valleys. The brush covered hills, Upper Sonoran and as far up as low Transition, is the favored winter habitat, with local variations as elsewhere noted.

In April, 1912, while the author was collecting at the eastern base of the Sierra Nevada, near Lone Pine, Inyo County, fox sparrows were observed migrating northward. All that were taken were *schistacea*, the forms that nest in the adjacent mountains, *mariposae* in the Sierra Nevada, and *canescens* in the White Mountains, not being detected in the lowlands at all. This fact, and also the non-occurrence of *stephensi* in the foothills of the mountains wherein the latter breeds, is, I believe, in each case, indicative of rather abrupt arrival at, and departure from, the breeding grounds, with no tarrying in the lowlands nearby; suggestive of just such migration, in fact, as has been inferred on similar grounds in certain of the Alaskan subspecies.

In September, 1916, in the Kings River Cañon, in the Sierra Nevada, the first migrating fox sparrow was noted on September 10, and several others were observed during the next few days. Those collected proved to be all *schistacea*, evidently from some point considerably to the northward, and no specimens were taken of *mariposae*, the race breeding in the Sierra Nevada to the north and east of Kings River Cañon. No *Passerella* was found breeding on the floor of the cañon. A few days later, at Horse Corral Meadow, on the adjacent table land to the southward, fox sparrows of several subspecies were found migrating abundantly. It seemed apparent that there was no migration from the east to the west side of the Sierras, or vice versa, in which the Kings River Cañon could be used as a highway, and this was borne out by the manner of occurrence of many species of birds besides the fox sparrows. It was also apparent that migrants were travelling southward in numbers along the line of the Sierras, stopping at favorable places along the higher ridges, but not descending, except rarely, into the deep gorge that cut across their path.

***Passerella iliaca iliaca* (Merrem)**

Eastern Fox Sparrow

Original description.—"Fringilla iliaca Merrem, Beytr. besond. Gesch. Vögel, 11, 1786, pl. x. (North America.)" (A. O. U. Check-List, 1910, p. 277.)

Type specimen.—Not known to exist.

Range.—"North America. Breeds in Boreal zones from tree limit in northeastern Alaska, northern Mackenzie, central Keewatin, northern Ontario (Moose Factory), and northern Ungava south to central Alberta, northern Manitoba, southern Keewatin, Magdalen Islands, and Newfoundland; winters from lower Ohio and Potomac valleys (occasionally further north) to central Texas and northern Florida; casual on the coast of southern Alaska and in California." (A. O. U. Check-List, 1910, p. 277.) One record from Arizona (see p. 118).

Specimens examined.—48 (see list, p. 184).

Distinguishing characters.—From all subspecies of the Schistacea group, *iliaca* is distinguished by different proportion of wing and tail lengths (wing longer than tail in *iliaca*, wing equal to, or shorter than, tail in the Schistacea group), and by the predominance of bright, ruddy coloration. From all subspecies of the Unalascænsis group, *iliaca* is distinguished by the much brighter hue of its red markings, by the sharply contrasting red and gray streaking dorsally, and by the heavier and more stubby bill. Within the *Iliaca* group *iliaca* is distinguished from the one other subspecies, *altivagans*, by greater general size, and brighter, more ruddy coloration, with dorsal streaking much more sharply defined.

Remarks.—There are at hand fourteen specimens of *Passerella iliaca iliaca* taken in California that are evidently referable to *Passerella iliaca iliaca*; a small enough number to allow of individual consideration being given to each.

No. 4932, collection of A. B. Howell; male; Pasadena; December 13, 1907; collected by A. Van Rossem. (See Willett, 1912, p. 85.) This bird appears to be absolutely typical of *iliaca*, being closely matched in all respects by selected specimens from Illinois. It is, however, rather small for a male, though it is marked as such, approaching more nearly the dimensions of some females.

No. 867, collection of J. R. Pemberton; female; Big Sur River, Monterey County; December 22, 1903; collected by J. R. Pemberton. (See Pemberton, 1908, p. 50.) Apparently a typical example of *iliaca*. Very closely similar to the specimen last described, and likewise duplicated by selected eastern birds.

No. 384, collection of A. B. Howell; female; Burbank, Los Angeles County; November 11, 1911; collected by A. B. Howell. (See Howell, 1912, p. 41.) Ventrally indistinguishable from eastern birds, but dorsal coloration generally more reddish. The streaks on the back are broader and consequently less sharply defined, and there is none of the clear gray on head and neck that is apparent on all the eastern specimens used in comparison. Wing bars but faintly indicated.

No. 789, collection of J. Eugene Law; sex not determined; Lankershim, Los Angeles County; March 22, 1908; collected by J. Eugene Law. (See Willett, 1912, p. 85.) Closely similar to eastern examples, the main difference lying in

the duller dorsal coloration of the California bird. The dorsal streakings are less ruddy than in eastern specimens, and less sharply defined. Top of head is gray, washed with brownish, as in many eastern birds, and the sides of neck are as clear gray as is seen in other winter collected specimens of *iliaca*. Ventrally it is indistinguishable from typical *iliaca*. Wing bars faintly indicated.

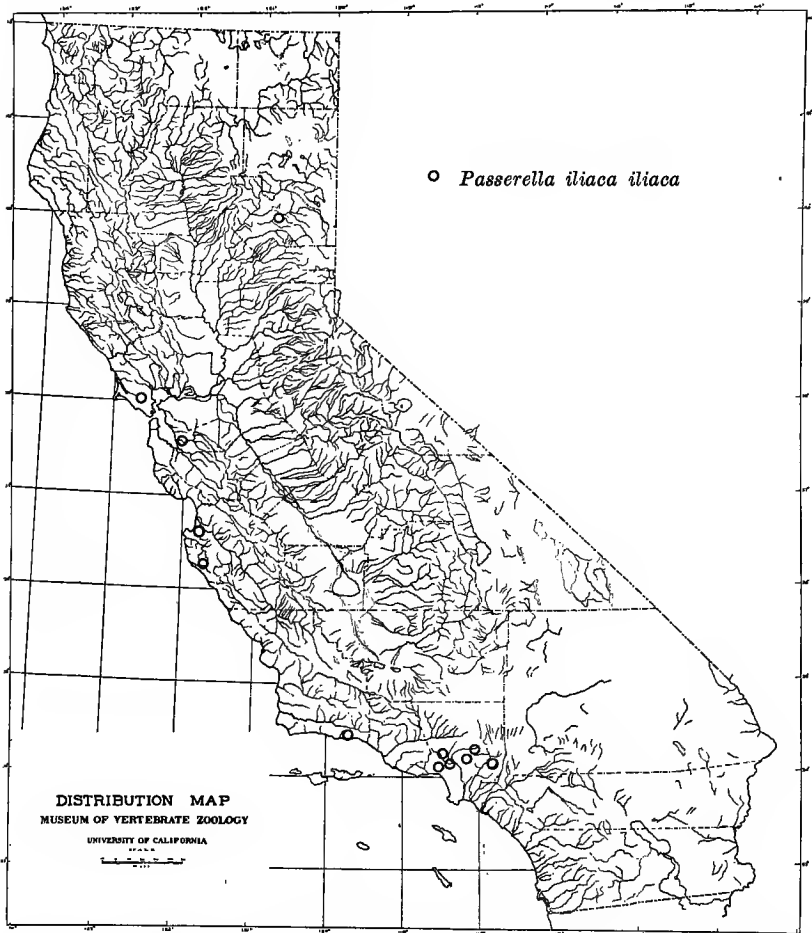


Fig. J. Map showing stations of occurrence in California of *Passerella iliaca iliaca*, as established by specimens examined by the author.

No. 30445, Mus. Vert. Zool.; male adult; Seaside, Monterey County; December 26, 1918; collected by H. G. White. Differs from average eastern birds mainly in somewhat darker coloration. Dorsal streaking and wing bars not so strongly indicated as in eastern collected specimens.

No. 3233, collection of J. Grinnell; male; Mount Wilson, Los Angeles County; October 31, 1897; collected by J. Grinnell. (See Grinnell, 1915, p. 130.) This bird, together with the rest of the specimens here listed, is suggestive of *iliaca*

rather than any other subspecies, but differs from the mode of that race in certain details of markings and color. Dorsally this bird has hardly a trace of streaking, the back being almost uniformly reddish, with a suggestion of underlying gray about the head and neck. The ventral streakings, though of a brighter, more "foxy" red than in the *Unalascensis* group, are not so red as in typical *iliaca*. Wing bars are but faintly indicated.

No. 4630, collection of J. and J. W. Mailliard; male; San Geronimo, Marin County; January 26, 1901. (See Mailliard, 1901, p. 72.) Close to typical *iliaca*, differing from eastern birds mainly in less contrasted streaking above, and in more blackish markings below. Bill as in typical *iliaca*, and wing bars conspicuous.

No. 4208, collection of J. and J. W. Mailliard; female; Plumas County, "alt. 4000"; September 27, 1898. Differing from eastern birds only in being less streaked dorsally. The general appearance of the back is reddish brown, mottled rather than longitudinally streaked. Wing bars conspicuous.

No. 750, collection of A. B. Howell; female; Santa Barbara; January 1, 1911; collected by J. H. Bowles. (See Bowles, 1911, p. 175.) Ventrally indistinguishable from selected eastern specimens. Back and top of head almost uniformly dull grayish brown, back obscurely mottled with somewhat darker brown. Reddish coloration on rump and upper surface of tail feathers rather paler than in typical *iliaca*. Wing bars fairly well defined.

No. 2003, collection of W. Otto Emerson; male; Hayward, Alameda County; December 12, 1898; collected by W. Otto Emerson. Differs from average eastern examples of *iliaca* in the darker, less reddish, coloration of the spots below, and in the almost uniformly brown back. The dorsal region is dull brown, faintly mottled with darker brown, and on the head and neck there is a dull brown wash over an underlying grayish color. Wing bars faintly indicated.

No. 1811, collection of W. M. Pierce; male; Palmer's Cañon, Los Angeles County; February 2, 1919; collected by W. M. Pierce. Differs from eastern birds in its generally darker coloration and heavier ventral markings. Upper parts dark grayish brown, washed with reddish; back obscurely streaked with dark reddish. Breast streakings of a brighter reddish color than the back. Wing bars faintly indicated. This bird is fairly intermediate between typical *iliaca* and *unalascensis*.

No. 1810, collection of W. M. Pierce; male; Palmer's Cañon, Los Angeles County; February 1, 1919; collected by W. M. Pierce. To all appearances this specimen lies between typical *iliaca* and *altivagans*. It is larger than average examples of the latter, darker colored and more heavily marked below. Upper parts nearly uniform grayish brown, more grayish on the head, more brownish on dorsum. No dorsal streakings and no wing bars. In color and markings this bird is close to *altivagans*, in dimensions it is nearer *iliaca*.

No. 2805, collection of F. S. Daggett; male; Nicasio, Marin County; February 6, 1906; collected by C. A. Allen. Spotting beneath of a darker brown than in any eastern specimen; top of head and back almost uniform dull brown; dorsal region faintly spotted. Wing bars faintly indicated. This bird is about intermediate in color and markings between typical *iliaca* and *insularis*. The bill is as in *iliaca*, and on the whole the specimen seems best referred to that subspecies.

No. 1180, collection of L. E. Wyman; female; Santa Monica Mountains, Los Angeles County; January 31, 1917. Collected by L. E. Wyman. This bird can be considered an example of *iliaca* only by reason of the manner in which the series of variants just detailed connects this extreme with the mode of the subspecies. It is in a slight degree further from the type than the specimen last described. Under parts are rather heavily streaked, and with a dark shade of

brown; upper parts almost uniform, a faint suggestion of gray underlying the brown of the head and neck, the back slightly mottled, and the wing bars barely apparent. The character of the bill, however, is closely similar to that in *iliaca*.

From the appearance of the specimens described above several deductions may be drawn. These birds are all to be referred to the subspecies *iliaca*, but, with two exceptions (no. 4932, coll. A. B. Howell, and no. 867, coll. J. R. Pemberton), they vary from typical *iliaca* sufficiently to be noticeable if inserted among a series of eastern collected skins. The specimens all resemble *iliaca* most nearly in the ventral markings; the greatest variation is evident on the upper parts. These birds all show a tendency toward elimination of dorsal streak-

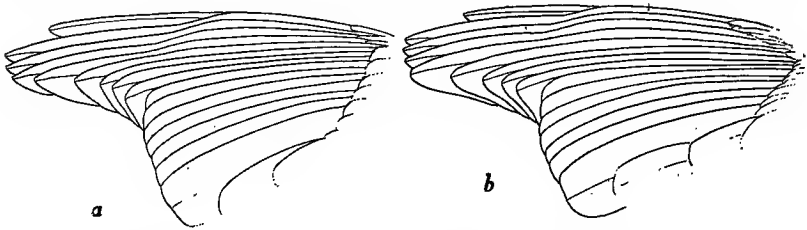


Fig. K. Wings of the two subspecies of fox sparrow of the *Iliaca* group, natural size.

a. *Passerella iliaca iliaca*, adult male; no. 6088, Mus. Vert. Zool.; Eastford, Connecticut; April 12, 1876.

b. *Passerella iliaca altivagans*, adult male; no. 26039, Mus. Vert. Zool.; Aspen Valley, Yosemite National Park, California; October 14, 1915.

ings, with consequent greater uniformity of color on the upper parts. This color in some is reddish, of a darker shade than is seen in typical *iliaca*, while in others it is decidedly gray. Such variation as appears in the breast streakings tends toward the darker shades of red.

In the subspecies *iliaca* there is, according to Ridgway (1901, p. 387), great variation in color, the extremes being designated by him as the "gray phase" and "red phase," respectively, and these differences are sufficiently correlated with different regions to suggest the possibility of the eventual recognition of two subspecies. "The extreme rufous phase seems to be represented only in the Atlantic Coast district, and is altogether wanting in Alaska and other north-western portions of the continent, where only birds representing the gray extreme occur" (Ridgway, *loc. cit.*). However, it is extremely unlikely that the reddish-colored birds occurring in California in winter are migrants from the Atlantic Coast, where the red phase of *iliaca* has its habitat. The probabilities are that the Californian migrants

in question arrive from the northwest together with the other fox sparrows with which they are found associated. My personal conviction is that they hail from an intermediate locality, or localities, between the ranges of typical *iliaca* of the interior of Alaska and those of some of the Unalashcensis subspecies of the coast. Some of the specimens described in this paper, together with certain variants of *insularis* and *unalaschcensis* at hand, form, both in color and proportions, a graded series connecting the extremes by such short steps that any dividing line between the two must be arbitrarily drawn. Then, too, the reddish coloration of these birds is of an appreciably darker shade than in the few Atlantic coast winter birds available for comparison, tending more toward the color of the Unalashcensis subspecies. The more grayish-backed birds may represent a step toward *altivagans*. I can not agree with the opinion that the character of any of these birds points toward interbreeding of *iliaca* with *schistacea* (see Grinnell, 1915, p. 130).

Beside the California birds described, there are two other specimens from unusual localities. One is a female (no. 2524, coll. J. Eugene Law) taken by A. Van Rossem in Pinery Cañon, at 6000 feet, Chiricahua Mountains, Arizona, November 6, 1914. This specimen, here placed on record, comprises the first recorded occurrence of the subspecies in Arizona. It is extremely close to typical *iliaca*, differing mainly in its more uniform dorsal coloration, the back being quite grayish, and the dorsal streakings but poorly defined. This may be indicative of intermediateness between *iliaca* and *altivagans*. The second specimen is a male (no. 967, Provincial Museum, Victoria, B. C.), collected by John Fannin at Sicamous, British Columbia, September 25, 1893. This bird is absolutely indistinguishable from selected eastern examples of *iliaca*.

The California specimens of *iliaca* are too few in number to indicate any definite manner of occurrence in any specified area, but it seems unquestionable that some individuals of this subspecies winter each year within the borders of the state. Most of the specimens taken are from the San Diego region (where, however, there has been more winter collecting of fox sparrows than anywhere else in California), and as these were all secured between October 31 and March 22, they may be assumed to have been in their winter home. The specimens taken in December in Monterey and Alameda counties, and in January and February in Marin County, indicate the probability of the winter habitat including the whole coastal area north

to the San Francisco Bay region. The one specimen from the Sierra Nevada of Plumas County, taken September 27, was probably a migrant on its way farther south.

It is noteworthy that nearly all the California examples of *iliaca* were secured by collectors who had gathered specimens for years at the several points where these birds were taken, hence the small number of specimens of this race, compared with those of most of the other wintering subspecies of *Passerella*, may be taken as fairly indicative of the relative numbers of each actually present.

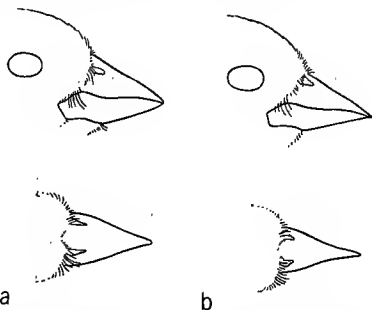


Fig. 11. Bills of the two subspecies of fox sparrow of the *Iliaca* group; natural size.

a. *Passerella iliaca iliaca*, adult male; no. 6088, Mus. Vert. Zool.; Eastford, Connecticut; April 12, 1876.

b. *Passerella iliaca altivagans*, adult male; no. 26039, Mus. Vert. Zool.; Aspen Valley, Yosemite National Park, California; October 14, 1915.

Besides the specimens here listed there are others recorded from California that I have not seen, as follows: "Accidental in California (spec. in Mus. S. I.)" (Coues, 1874, p. 161); specimen from Poway, San Diego County, January 3, 1888 (W. E. Bryant, 1889, p. 90); specimen from Oakland, December 2, 1892 (W. E. Bryant, 1893, p. 363); Saticoy, December 14, 1872 (Baird, Brewer and Ridgway, 1874, p. 516).

Passerella iliaca altivagans Riley

Alberta Fox Sparrow

Original description.—*Passerella iliaca altivagans* Riley, 1911, p. 234.

Type specimen.—No. 222832, U. S. Nat. Mus.; male, immature; Moose Branch of Smoky River (about 7000 feet altitude), Alberta; July 31, 1911; collected by J. H. Riley (original number, 2175).

Range.—In summer known only from a few points in the interior of British Columbia and the adjacent part of Alberta (see map, fig. N). In winter southward at least to extreme southern California.

Winters mainly in the San Diego region and on the western slope of the Sierra Nevada (see map, fig. M).

Specimens examined.—90 (see list, pp. 185–186).

Distinguishing characters.—Of the *Iliaca* group (see p. 89). Somewhat smaller than *iliaca*; size and proportions about as in the subspecies of the *Unalascensis* group (see table 4). Coloration more subdued than in *iliaca*; rather brighter, with more strongly contrasting reds and grays, than in any of the *Unalascensis* group.

Remarks.—While the breeding range of the Alberta fox sparrow cannot yet be exactly defined, it may be said in general terms to be in the interior of British Columbia and in the adjoining portion of western Alberta. The breeding stations afforded by Riley's type series are the Moose Pass region on the boundary line between British Columbia and Alberta, and Thudade Lake, British Columbia. To these I am now able to add Jasper Park, Alberta, and McGillivray Creek, and Mt. McLean, Lillooet District, British Columbia. The migration route, as indicated by specimens at hand, would be through the western part of the Great Basin, in a path whose width extends from western Montana to central Oregon, and southwestwardly at least as far as extreme southern California. The winter home apparently lies almost entirely within the confines of California. There is one specimen at hand (not typical, however) from Government Island, near Portland, Oregon, taken December 15. In California the line of migration seems to lie entirely east of the coast ranges. There are no records from these mountains, nor even from the floor of the Sacramento-San Joaquin Valley, immediately to the eastward, while there are specimens, migrants, from many points the whole length of the Sierra Nevada.

In all probability, judging from the available data, the winter metropolis of *altivagans* is in the western foothills of the southern Sierra Nevada, perhaps as far north as Eldorado County, and in southern California west from the eastern bases of the several mountain ranges separating the desert and the Pacific slope, with sporadic occurrences in the San Francisco Bay region. It may be that the subspecies winters regularly in the coast ranges from San Francisco Bay southward. There is but one specimen at hand from this region, but there has been practically no winter collecting carried on there.

As to dates of arrival and departure in California, a bird taken September 22, at Horse Corral Meadow, in the Sierra Nevada of Fresno County, is the earliest fall migrant, and a specimen from the Sierras of Plumas County, "alt. 4000 feet," April 24, is the latest in

the spring. The Horse Corral Meadow bird was taken on an expedition headed by the present writer, and, as observed by him, was one of a "wave" of migrating northern fox sparrows which had just

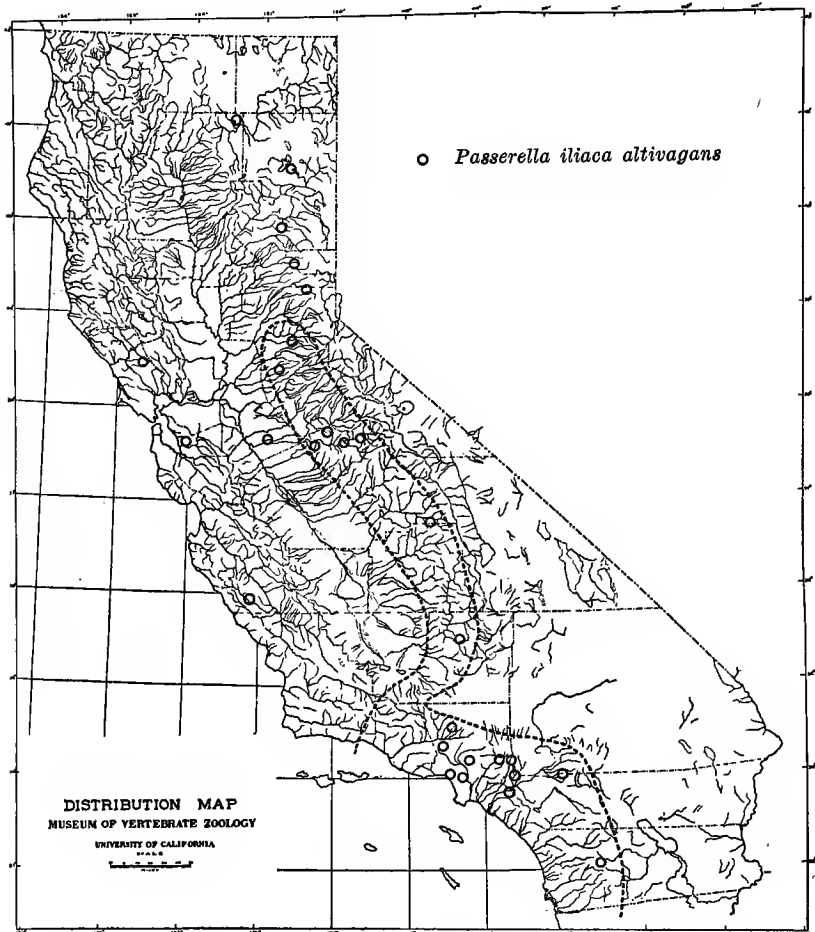


Fig. M. Map showing stations of occurrence of *Passerella iliaca altivagans* in California, as established by specimens examined by the author. The region enclosed within the dotted outline is believed to be the main winter habitat of the subspecies.

arrived in a region where we had been collecting birds for some time. It may therefore be regarded as quite accurately representing the arrival of the subspecies there in that year.

Passerella iliaca altivagans was described by Riley (1911, p. 234) upon the basis of four young birds, three from the Moose Pass region,

on the British Columbia-Alberta boundary, and one from Thudade Lake, British Columbia. The subspecies is described (*loc. cit.*) as "Similar to *Passerella iliaca schistacea*, but middle of the back mars brown instead of mouse gray; wings and tail with more red in the brown (near burnt umber)." Of some additional specimens, migrants and winter birds, Riley remarks that "from typical *Passerella iliaca schistacea*, to which they have been referred, they are quite distinct, having the mouse gray of the upper parts of that race replaced by broccoli brown and burnt umber and the spotting of the under parts prout's brown, not sepia. Apparently there is no difference in size."

The A. O. U. Committee (1912, p. 386) denied recognition to this subspecies on the ground that it was "too near *P. i. schistacea*." The form was recognized by Grinnell (1915, p. 130), and some years later Oberholser (1918, p. 186) reasserted the validity of *altivagans*, affirming its near relationship to *iliaca*, and its unlikeness to any other race.

Most of Riley's type series has been available for the present study. The three birds collected by him (in July) and described (*loc. cit.*) as "nearly adult" or "slightly immature," are, speaking more exactly, molting from juvenal into first winter plumage. The type specimen has reached the most advanced stage in the change, but all three still show large tracts of juvenal feathers. However, there is enough of the new plumage in place to afford a fair basis for comparison with full feathered migrants from points farther south, and thus to establish with fair certainty the color characters of *altivagans* in its typical form. A specimen in fresh fall plumage (no. 26039, Mus. Vert. Zool.), selected for its close resemblance in comparable parts with the molting type of *altivagans*, is colored as follows: Upper parts generally mummy brown, most ruddy on dorsum, dullest on rump. Feathers of dorsum with dark centers, giving an obscurely streaked effect. Sides of neck washed with grayish. Upper tail coverts auburn, with narrow edgings of paler brown; exposed portion of rectrices auburn. Under parts white, chin, throat and abdomen nearly immaculate, elsewhere marked with triangular spots, varying in color from some the same shade as the back, to others suffused with blackish. Exposed portion of wing coverts and remiges auburn, like tail. Median and greater wing coverts slightly tipped with whitish, forming two ill-defined bars.

The above described specimen is an average fall-plumaged example of this subspecies, though there are others at hand showing diverse extremes of dorsal coloration, of grayish or of reddish. Specimens

taken in the spring, and consequently in less fresh plumage, are duller, less ruddy, and more grayish than fall birds. From what can be seen of the juvenal plumage of the Moose Pass birds, in this stage the markings are more ruddy than in juvenals of *schistacea*, which they otherwise most nearly resemble. There are no young of *iliaca* available for comparison. The large series that I have been able to bring together, though yielding few summer birds additional to those of Mr. Riley, abundantly demonstrates the distinctness of this subspecies, and there is no difficulty in recognizing in the winter birds from California the same race as that from British Columbia described by Riley.

The small series from McGillvary Creek, British Columbia, presents several points worthy of emphasis. It includes five specimens, one in juvenal plumage, two well advanced in the post-juvenal molt, and two in fully acquired winter plumage, whether immatures or adults is not apparent. From the dates at which they were taken (August 10 to 18), and from the fact that one is still in the juvenal plumage, these birds may be assumed to have been taken upon their breeding ground. McGillvary Creek is, in a direct line, less than ninety miles east of the general line of the coast, much less than that distance east of several deeply penetrating arms of the sea, and may be assumed to represent a point on the western boundary of the habitat of *altivagans*. It indicates the occurrence of the subspecies as far west as the eastern slope of the ranges most closely adjoining the coast. The birds from this point, though properly referable to *altivagans*, differ appreciably from the mode of that subspecies. The under parts are of a richer brown, and more heavily streaked, and there is an entire absence of streaking above, producing an evident appearance of intergradation toward the character of the Unalascensis subspecies. They can be very nearly matched with some winter birds from California.

There is a series of July birds from Mt. McLean, so short a distance east of McGillvary Creek that the two lots must perforce be of the same race. Yet the worn and faded plumage of the Mt. McLean birds betrays hardly a trace of the brown coloration seen in the McGillvary Creek fall specimens, and the former are superficially very much like *schistacea*. However, the breast spottings still show a browner tinge than is seen in that race.

The California series as a whole exhibits some little variation in color, though not so much but that the birds can, with all certainty,

be placed with *altivagans*, as now defined. From a style that may be taken as typical of the subspecies, the mode of coloration most frequently seen—pale reddish back, obsoletely streaked with darker red, and underparts moderately streaked—there are two extremes of variation. One is darker colored, dark reddish brown above, heavily marked below, the other predominantly grayish above and but sparsely spotted on the breast. These specimens I take to represent various degrees of intergradation, the reddish colored birds toward the coastal subspecies of the Unalascensis group (as shown in the McGillvary Creek series), the grayish colored ones toward *iliaca*. It will be noted in these non-typical birds as well as in typical *altivagans*, that tail is always shorter than wing, as is the case in all fox sparrows outside the Schistacea group. There are a few apparent intergrades of another type, of duller, less reddish coloration and with tail of about the same length as wing. These I take to represent intermediate stages between *altivagans* and *schistacea*.

Of a series of nine specimens taken by W. M. Pierce in certain cañons near Claremont, southern California, during the winter of 1918–19, practically all are variants from typical *altivagans*, apparently tending toward some of the darker colored coastal races. One of these birds (no. 1776, col. W. M. Pierce) is closely similar to one of the summer specimens from McGillvary Creek, British Columbia.

Compared with the subspecies of the Schistacea group, *altivagans* is apparently always distinguishable by the proportionate lengths of wing and tail, wing longer than tail in *altivagans*, rarely the same length, wing usually shorter than tail, in all members of the Schistacea group. In the occasional variant of *altivagans* in which coloration somewhat closely approaches some examples of *schistacea*, the wing and tail measurements suffice for identification. In typical *altivagans* the spots on the lower surface are more ruddy than in the Unalascensis group, and rather less thickly distributed, leaving more white showing through where the spots are thickest, and more extensive pure white areas on throat and belly.

It is quite possible that the name *altivagans* as now used covers a composite of several recognizable subspecies, as was the case in the former "*megarhynchus*" and "*schistacea*." The breeding birds available are few in numbers and from but two or three scattered points, while as regards the greater part of the interior of the vast northwest nothing is known of the *Passerella* population. In view of

the manner in which fox sparrows are distributed over much of the general range of the species elsewhere, locally segregated at scattered points, and considering the variation seen elsewhere in series of breeding birds taken from isolated, but relatively close colonies, it would not be surprising if the diverse specimens of *altivagans* from the winter home of that race, should prove to be representative of additional recognizable subspecies, forming chains of variants comparable to those just mentioned.

Riley's type series from the Moose Pass region was taken at high altitudes (see Riley, 1912, p. 69), and the McGillivary Creek birds were collected at 5000 feet and 7000 feet altitude. These facts point to the probability of *altivagans* inhabiting in summer the higher mountains, and not occurring in the valleys, just as is the case with the related subspecies to the southward. Under such conditions there is added probability of the existence of distinguishable forms within the general range here ascribed to *altivagans*.

Two skins from Pentieton and one from Midway, British Columbia, show a leaning toward *schistacea*. While from the dates of capture (April 21 and May 5) they may have been migrants at the points where they were taken, it is probably fair to assume that they would have bred somewhere near-by, and that these places therefore lie just north of the boundary line between *altivagans* and *schistacea*. In typical form, therefore, *altivagans* probably does not breed south of the British Columbia-Washington boundary, nor *schistacea* north of it.

An interesting sidelight on the status of this subspecies is afforded by the comments written upon the labels of many specimens examined from contributing collections. There is hardly a bird collection of any size in California but contains one or more examples of this race, many of them collected years before *altivagans* was described. These specimens have almost invariably been a source of trouble to their owners, for various names are written and rewritten upon the labels, frequently with question marks appended. Some of these birds have been referred to different authorities for naming, and the labels reflect opinions of their relationships, which, though diversely worded, are mostly in agreement as to the general status of the race. "*Schistacea*—not typical," "*schistacea* × *iliaca*," "*iliaca*—intergrade," are the terms most frequently seen, terms which quite accurately indicate the systematic position of *altivagans*, and in their unanimity also express the need of, and justification for, the naming of the subspecies.

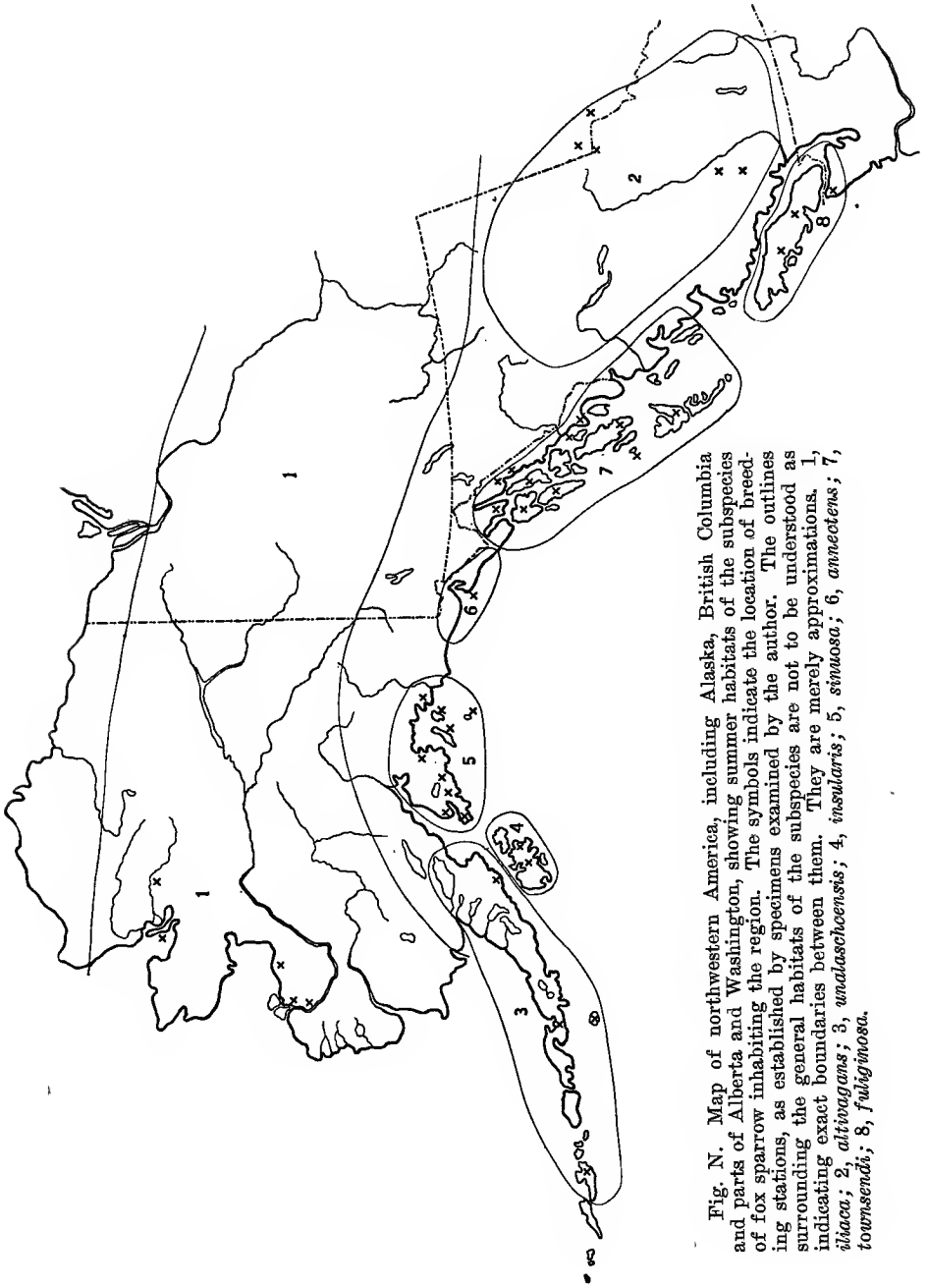


Fig. N. Map of northwestern America, including Alaska, British Columbia and parts of Alberta and Washington, showing summer habitats of the subspecies of fox sparrow inhabiting the region. The symbols indicate the location of breeding stations, as established by specimens examined by the author. The outlines surrounding the general habitats of the subspecies are not to be understood as indicating exact boundaries between them. They are merely approximations. 1, *silacea*; 2, *altivagans*; 3, *undulatachocensis*; 4, *insularis*; 5, *sinuosa*; 6, *annectens*; 7, *townsendi*; 8, *fuliginosa*.

***Passerella iliaca unalaschcensis* (Gmelin)**

Shumagin Fox Sparrow

Original description.—*Emberiza unalaschcensis* Gmelin, 1788, p. 875. Based on "Unalashka Bunting. *Arct. zool.* 2. p. 364. n. 232. *Lath. syn.* II. 1. p. 202. n. 48. Habitat in Unalashca. . . ."

Type specimen.—Not known to be in existence.

Range.—In summer, the Alaska Peninsula, Shumagin Islands, and Unalaska Island; in winter, south at least to extreme southern California.

Specimens examined.—83 (see list, pp. 186–187).

Distinguishing characters.—Of the *Unalaschcensis* group (see p. 89). Within this group, of relatively large size, with large bill, and with the minimum of red or brown coloration seen in this section of *Passerella*; and thus easily distinguished from *fuliginosa*, *townsendi* or *annectens*. Compared with *sinuosa*, *unalaschcensis* (in both types of color and bill structure [see *postea*]) is even less reddish, and with larger bill. Of about the same size as *insularis*, but with differently shaped bill, and of duller coloration.

Remarks.—*Unalaschcensis* is apparently of rather rare occurrence in most parts of California, to judge from the few specimens contained in collections. The series of breeding birds at hand also is unsatisfactory, in that but few localities are represented within the probable summer habitat. The variety of characters represented in birds in the winter series is such as to raise questions regarding their proper classification; questions that can not be answered prior to the accumulation of much more information about the summer home of the subspecies, and some additional material from various points therein.

California winter birds may be divided into two categories, one comprising birds of pale brownish coloration, rather ashy in general tone, and with long pointed bill; the other, birds decidedly darker in appearance, rather plumbeous in tone, and with short, heavy bill. Extremes of these two types are as widely different as any two recognized subspecies within the *Unalaschcensis* group. They are here lumped under *unalaschcensis*, first, because of intergradation which links them so closely as to indicate nearer relationship between the two than to any other race, as seems to be shown by the winter specimens, and second, because of the present impossibility of a satisfactory understanding of conditions in the summer habitat.

Emberiza unalaschcensis Gmelin (1788, p. 875) was based upon the Aonalashka Bunting of Latham (1782, p. 202), and the Unalashka Bunting of Pennant (1785, p. 364). Ridgway (1901, p. 389, footnote)

comments upon the applicability of the name as follows: "Although no *Passerella* has hitherto been found on Unalaska (unless the Aoonalashka Bunting of Latham really came from there), it is not at all unlikely that the present form may occur there, at least accidentally.

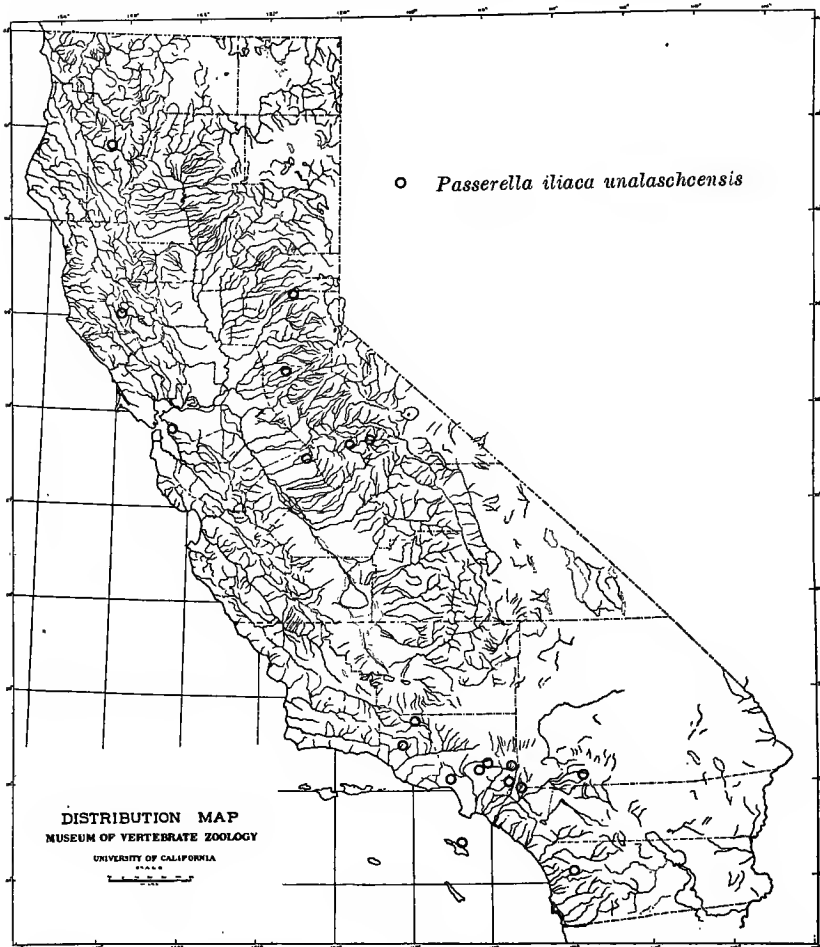


Fig. O. Map showing stations of occurrence of *Passerella iliaca unalascensis* in California, as established by specimens examined by the author.

Certainly if any form of the genus does occur on that island it would be the present one rather than the Kadiak form, most of the land birds of the Shumagins and Unalaska being the same, e. g., *Leucosticte griseonucha*, *Passerina nivalis townsendi*, *Melospiza melodia cinerea*, etc.' This form inhabits, on the Shumagins and the peninsula, alder

thickets. No alders now grow on that portion of Unalaska Island within sight from the town of Unalaska or its vicinity, but they may have done so formerly, or may now occur in other parts of the island. At any rate, it seems better to retain the name *unalaschensis* for the present form rather than to give it a new one, since the *Emberiza unalaschensis* of Gmelin seems almost certain to have been the present form."

There is in the Museum of Vertebrate Zoology a *Passerella* from the island of Unalaska. This specimen (no. 4585, male adult), collected by C. L. Hall, is labelled as from "Ounalaska, Alaska, June 4, 1894." There is no reason to doubt the authenticity of the skin.

It is one of a large collection of Alaskan animals that came into the possession of this Museum, all taken by the same man, and all carefully prepared and fully labelled; furthermore, the date of capture of this skin accords with other dates upon specimens, from the same island, of species well known to occur there. These facts, together with other corroborative evidence adduced from the collection as a whole, fix the origin of this fox sparrow beyond any reasonable doubt, even were there occasion to view it with suspicion. This skin is unfortunately a rather poorly made specimen, but it is apparently of the plumbeous colored, heavy-billed type above described.

On the other hand, the considerable series of breeding birds from points on the Alaska Peninsula are all of the more ashy colored, slender billed type, also represented in California in winter. These facts point to the further restriction of *unalaschensis*, as a plumbeous colored, heavy-billed bird, breeding on Unalaska Island and possibly some adjacent territory, with the consequent naming of a new subspecies (of ashy coloration and with longer, more slenderly pointed bill), breeding on at least the eastern two-thirds of the Alaska Peninsula. In the lack of an adequate series of birds from Unalaska it is

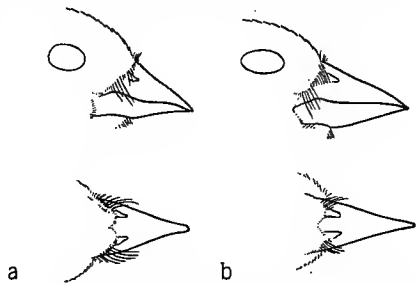


Fig. P. Bills of specimens of *Passerella iliaca unalaschensis*, natural size. These birds are from different parts of the range of the subspecies, as it is now defined. Note the short, stubby bill of *a*, as compared with the long, slender one of *b*. These structural differences are correlated with differences of coloration.

a. Adult male; no. 4585, Mus. Vert. Zool.; "Ounalaska," Alaska; June 4, 1894.

b. Adult male; no. 90835, Amer. Mus. Nat. Hist.; Muller Bay, Alaska Peninsula, Alaska; June 1, 1903.

undesirable to take any such formal action, and I prefer merely to indicate what may be the explanation of the two different types of birds I have here included under the subspecific name *unalaschcensis*.

Birds of the Alaska Peninsula type show a range of variation undoubtedly indicative of intergradation with *sinuosa*, the subspecies next adjoining on the southeast. There are also some individuals apparently inclining toward *insularis*, of the closely adjacent Kadiak Island. This range of variation, including apparent intergrades as above indicated, as well as the two diverse types of *unalaschcensis*, all occurring among winter birds in California, has added greatly to the difficulty of recognizing the relationships of many specimens there taken. At the outset of this study the proper separation of *unalaschcensis* and *insularis* from the confused series brought together, was one of the most difficult problems encountered, and while the present solution of the question seems logical and fairly satisfactory, it must be borne in mind that it is largely hypothetical, and advanced merely as an apparent explanation of the observed facts. Absolute proof of its correctness awaits the study of additional summer specimens.

In the range of variation seen in winter birds, all the Alaska Peninsula type show some trace of brown or rufous. Even the summer birds show it to some degree, especially in the breast spotting. The plumbeous colored type of bird is much less rufous, many of this type presenting a dull slaty effect with scarcely a trace of reddish anywhere.

In its southward migration *unalaschcensis*, like *sinuosa*, apparently avoids the coast to a great extent. This is especially noticeable in California, where nearly all the record stations are at inland points until southern California is reached (see map, fig. O). Specimens taken at Helena, Trinity County, February 17, at Drytown, Amador County, December 8 and February 29, at Lakeport, Lake County, December 13, and at Berkeley, February 15, are apparently indicative of winter visitants at these points, but they are only scattered individuals, the main winter home of the subspecies apparently lying south of Tehachapi in southern California.

In the accompanying list of specimens (pp. 186-187) birds of the plumbeous colored type are marked with a superimposed figure (1) above the collection number, and it will be seen that this type of bird in winter is practically restricted to southern California. The paler colored Alaska Peninsula bird, found in southern California too,

occurs also in the Sierra Nevada. October 6 is an early date of arrival in the Yosemite region, October 7 in southern California. In the spring *unalaschcensis* lingers rather late, as shown by two birds taken in Ventura County on May 2 and 3.

Unalaschcensis is one subspecies that may prove to winter well south into Lower California, and from the data afforded by the series at hand I am inclined to believe that it does so. The San Pedro Martir

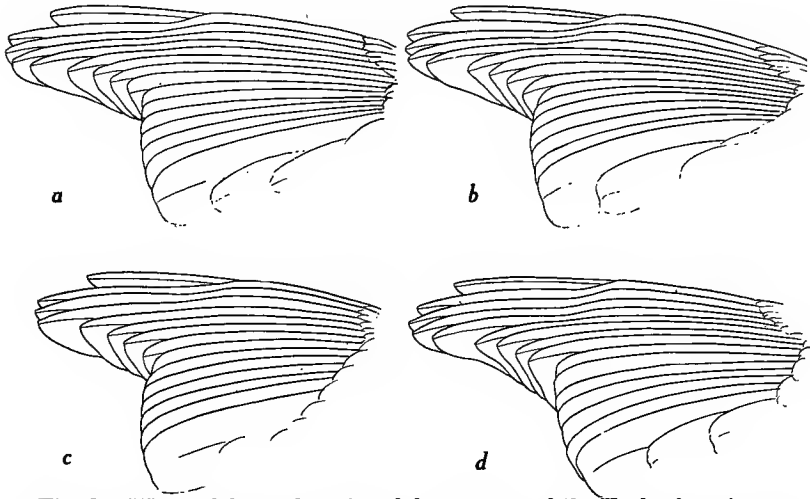


Fig. Q. Wings of four subspecies of fox sparrow of the Unalascensis group, natural size.

a. *Passerella iliaca unalaschcensis*, immature male; no. 26031, Mus. Vert. Zool.; near Yosemite Point, Yosemite National Park, California; October 30, 1915.

b. *Passerella iliaca sinuosa*, adult male; no. 1535, Mus. Vert. Zool.; Hinchinbrook Island, Prince William Sound, Alaska; June 25, 1908.

c. *Passerella iliaca townsendi*, adult male; no. 495, Mus. Vert. Zool.; Admiralty Island, Alaska; May 4, 1907.

d. *Passerella iliaca fuliginosa*, male; no. 27152, Mus. Vert. Zool.; Blue Lake, Humboldt County, California; December 4, 1916.

region, at least, should offer suitable surroundings for fox sparrows in winter. There is no information at hand regarding the winter bird population of those mountains, and it will be of interest to note the nature of occurrence of *Passerella* in the range.

A specimen from Tacoma, Washington, on January 10, and one from Portland, Oregon, November 7, are possibly indicative of winter visitants at these points, surely the extreme northern limits of the subspecies in winter. The Portland bird is not a typical example of *unalaschcensis*, and is apparently an intergrade toward *sinuosa*. One from Salem, Oregon, April 24, was probably a migrant.

Passerella iliaca insularis Ridgway

Kadiak Fox Sparrow

Original description.—*Passerella iliaca insularis* Ridgway, 1900, p. 30.

Type specimen.—No. 52475, U. S. Nat. Mus.; male adult; Kadiak, Alaska; May 17, 1868; collected by Ferdinand Bischoff.

Range.—In summer, Kadiak Island, Alaska; in winter, south along the Pacific Coast to extreme southern California.

Specimens examined.—100 (see list, pp. 188–189).

Distinguishing characters.—Of the *Unalaschcensis* group (see p. 89). Compared with *fuliginosa*, *townsendi*, and *annectens*, *insularis* is of paler coloration, of slightly greater general size, and with a notably larger bill. Compared with *sinuosa* and *unalaschcensis*, *insularis* is of brighter, more ruddy coloration. The bill of *insularis* is heavier than in *sinuosa*, about the bulk of that of *unalaschcensis* but differently shaped (see fig. S). A specimen of *insularis* in juvenal plumage at hand differs from the corresponding stage in the neighboring races *sinuosa* and *annectens* in just such color characters as are shown in the adults. It is of a brighter hue than the darker red *annectens*, and decidedly ruddy compared with the relatively grayish young *sinuosa*.

Remarks.—*Insularis* is apparently restricted in summer to Kadiak Island. It has also been tentatively ascribed to Middleton Island, near Prince William Sound (Ridgway, 1900, p. 30), but the two specimens from this island that I have examined, and upon which this claim may have been based, hardly justify this conclusion. These two birds are not exactly alike, but to my mind they both most closely resemble the subspecies *sinuosa* (see p. 136).

The series of winter birds does not suffice for as explicit an outlining of the winter habitat as is possible with some of the related subspecies, but there are, nevertheless, certain features of the distribution at this season that seem fairly well demonstrated by the data at hand. Judging from the few migrants secured at intervening points, the Kadiak fox sparrow, like the other northern coast forms of *Passerella*, apparently makes long, direct flights in its migrations to and from the summer home.

Once central California is reached, *insularis* does not seem to shun the seacoast, as do its near relatives *unalaschcensis* and *sinuosa*; on the contrary, it favors the coastal region and avoids the Sierras. There are no specimens of *insularis* at hand from any point on the California coast north of Marin County, though many *Passerellas* have been examined from this section; in Marin County *insularis* is a fairly common winter visitant, but outnumbered by *annectens*. In the Sierra

Nevada, though there are several record stations of capture, the number of individuals of *insularis* secured forms but a small percentage of the total number of *Passerellas* taken. The Pacific slope of southern California apparently forms the main winter home of this

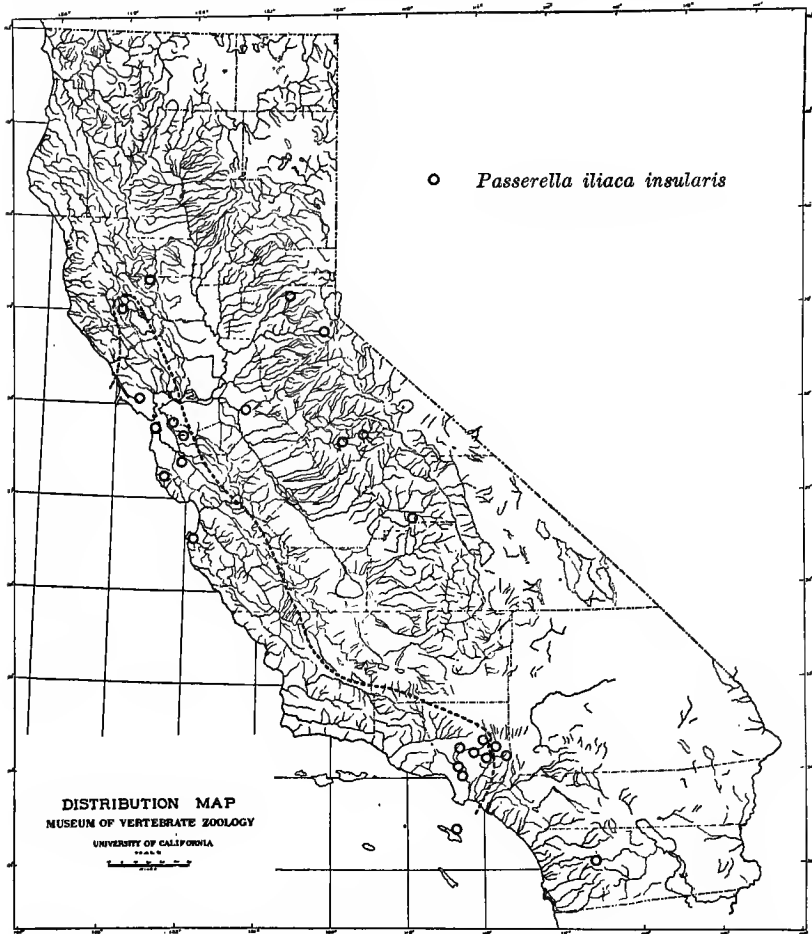


Fig. R. Map showing stations of occurrence of *Passerella iliaca insularis* in California as established by specimens examined by the author. The region enclosed within the dotted outline is believed to be the main winter habitat of this subspecies; in all probability most of the birds winter in the southern half of this region. The general avoidance of the mountains of the interior is in marked contrast to the distribution of the closely related *unalaschcensis* and *sinuosa*.

subspecies, and even here there is apparently a local restriction to regions fairly near the coast. *Insularis* is the most common form of the *Unalaschcensis* group in the western part of the San Gabriel

Mountains, in the vicinity of Pasadena. To the eastward, in the cañons above Claremont and Pomona, it is far outnumbered by *sinuosa*, and this appears to be the case in the San Bernardino Mountains also. There are only a few specimens at hand from that range, and there are no examples of *insularis* among them.

September 23, at Echo, Eldorado County, and September 25, at Hume, Fresno County, form early dates of arrival in the Sierra Nevada. There is one specimen at hand from Lakeport, Lake County, taken as early as September 7. In southern California dates of capture lie between October 19 and February 25, though it can hardly be doubted that the birds arrive there earlier and depart later than is indicated by these dates. Farther north there are specimens secured at Stony Ford, Colusa County, March 5, at Oakland, Alameda County, March 14, and at Stockton, San Joaquin County, April 8.

Following are dates and places of capture between California and Alaska: Fort Klamath, Oregon, April 13; Westminster Junction, British Columbia, April 27; New Westminster, British Columbia, March 22; Parksville, Vancouver Island, April 26; Howkan, Alaska, April 25; Kuiu Island, Alaska, April 30. These data indicate about the time of the northward migration, but the specimens of *insularis* thus represented form so small a percentage of the fox sparrows taken in the region that to my mind they should be considered as little more than strays from the regular line of travel. They will serve, perhaps, to indicate dates of passage, but to all appearances the mode of travel is mostly a long, direct flight, rather than a more leisurely series of short flights with frequent stops.

One specimen from Clackamas County, Oregon, February 16, possibly indicates the occasional wintering of *insularis* as far north as this.

It is rather singular that among the non-typical winter birds, referred perforce to *insularis*, the form they most nearly resemble, there should be so many apparently leaning toward *iliaca*. It is a question whether there can be actual intergradation between the two subspecies, with the ranges of *unalaschcensis* or *sinuosa* interposed between them, and with *insularis* restricted to an island habitat. The variants referred to usually resemble *insularis* in size of bill and bright, ruddy coloration, but show more or less obscure mottling or streaking upon the back, more or less distinct wing bars, and rather sharply defined breast markings. They may really be intergrades between *unalaschcensis* and *iliaca*, owing their bright coloring, and

consequent superficial resemblance to *insularis*, to their *iliaca* strain, but this is a point that can hardly be determined from winter birds alone.

***Passerella iliaca sinuosa* Grinnell**

Valdez Fox Sparrow

Original description.—*Passerella iliaca sinuosa* Grinnell, 1910, p. 405.

Type specimen.—No. 1593, Calif. Mus. Vert. Zool.; male adult; Drier Bay, Knight Island, Prince William Sound, Alaska; August 26, 1908; collected by J. Dixon; original number 309.

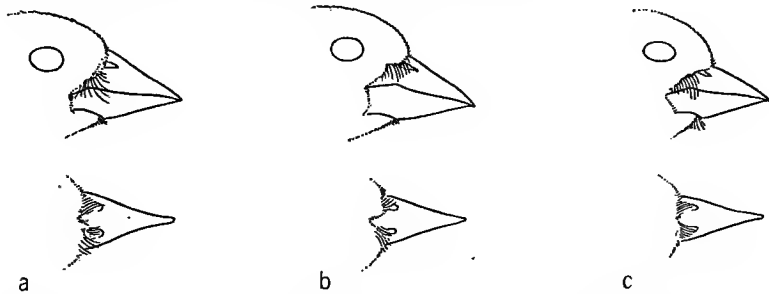


Fig. 8. Bills of three subspecies of fox sparrow of the Unalascensis group; natural size.

a. *Passerella iliaca insularis*, adult male; no. 9655, Mus. Vert. Zool.; Kuiu Island, Alaska; April 30, 1909.

b. *Passerella iliaca sinuosa*, adult male; no. 1591, Mus. Vert. Zool.; Hawkins Island, Prince William Sound, Alaska; June 22, 1908.

c. *Passerella iliaca annectens*, adult male; no. 7198, Mus. Vert. Zool.; Nicasio, Marin County, California; February 21, 1909.

Range.—In summer the Prince William Sound region (both on the islands and the mainland), Middleton Island, and the Kenai Peninsula, Alaska. In winter south on the Pacific slope at least as far as southern California. In its migrations and winter habitat *sinuosa* for the most part avoids the immediate vicinity of the coast. The main winter habitat appears to be the eastern part of the San Diegan region, southern California, but a certain percentage of the birds winters in the foothills along the west slope of the Sierra Nevada, and small numbers even as far north as central Oregon.

Specimens examined.—365 (see list, pp. 189–194).

Distinguishing characters.—Of the Unalascensis group (see p. 89). Bill rather long and slender, not as heavy as in *unalascensis* and *insularis*, but larger than in the more stubby-billed *annectens*, *townsendi*, and *fuliginosa* (see fig. 8). Coloration rather more reddish than in *unalascensis*, but decidedly less so than in the brighter colored *insularis*, and the darker *annectens* and *townsendi*. A noticeably ashy tinge dorsally and on sides of neck.

Remarks.—The summer habitat of *sinuosa* lies between the ranges of *unalascensis* and *annectens*, and, in physical characters also,

sinuosa occupies an intermediate position between these two subspecies. It is of less slaty, more brownish, coloration than *unalaschcensis*, but it is decidedly less brownish than the ruddy-colored *annectens* to the southward. In bill structure also it is intermediate, with bill smaller than in *unalaschcensis*, but rather larger than in *annectens*. The considerable series of *sinuosa* at hand from Prince William Sound includes many breeding adults, some juveniles, and some adults and immatures in fresh fall plumage. It is thus illustrative of age and seasonal variation, and there is considerable individual variation exhibited also, but nothing that can be correlated with local distribution. That is, birds from the several islands and from the mainland, as well as from the opposite sides of the sound, are all intrinsically alike. (See Grinnell, 1910, p. 407.) Two adult specimens from Montague Island (nos. 1569, 1572, Mus. Vert. Zool.), exhibit, perhaps, the extremes, one of brown, the other of gray coloration as seen in the entire series.

Six specimens at hand from points on the Kenai Peninsula are clearly referable to *sinuosa*. These birds, from the collection of the American Museum of Natural History, were referred to by Chapman (1902, p. 243; 1904, p. 404) under the names *annectens* and *unalaschcensis*, the subspecies *sinuosa* not having been described at that time.

Two birds from Middleton Island (nos. 115823, 115824, U. S. Nat. Mus.) appear to me to be clearly referable to *sinuosa*. These birds, in fresh fall plumage, were taken on August 26, a date sufficiently late to allow of their being perhaps wanderers from some other point, though they are more probably representative of the form breeding upon this island. They are very slightly aberrant from the mode of the Prince William Sound series in that both are a trifle paler colored and have distinctly more buffy under tail coverts, and that one has a slightly larger bill. It is interesting to note that two winter specimens from Echo, Eldorado County, California (nos. 88757, 88758, Amer. Mus. Nat. Hist.) duplicate these Middleton Islands birds in every particular. It is not uncommon, of course, to find winter specimens so different from the normal type of any of the described subspecies as to be difficult to place satisfactorily, but there are only one or two instances in the large series of fox sparrows here assembled where such birds can be linked up with a summer habitat, as appears to be the case with the two just mentioned.

There are many winter specimens at hand from points in California, which, though referred perforce to *sinuosa*, exhibit among them-

selves a much wider range of variation than is seen in the series from the summer habitat, showing practically every degree of divergence from typical *sinuosa*, on the one hand toward *unalaschcensis*, on the other toward *annectens*. These different types of birds, it is to be inferred, hail from appropriately intermediate localities between the summer home of typical *sinuosa* and the homes of the races they apparently approach in appearance. Whether the whole *Passerella* population from any one such place is uniformly of intermediate appearance, or whether in such regions a percentage of intermediates occurs among a preponderantly typical population, are questions which can not now be answered. The field work carried on at such points has as yet been insufficient to solve these problems. Among winter birds there are other non-typical specimens also, apparently referable to *sinuosa*, but showing a trend of variation not to be explained as an approach either to *unalaschcensis* or to *annectens*.

There are four birds from Vancouver Island (nos. 1623, 4082, 4091, 4095, Victoria Mem. Mus.) that I have provisionally placed with *sinuosa* though they are certainly not typical examples of that subspecies. One of these (1623) taken at Victoria on April 29, and probably a north-bound migrant, is, perhaps, to be explained as an intermediate toward *annectens*; but the other three, winter birds from Departure Bay, present peculiarities of dark coloration and thick bill not to be explained as an approach toward any other neighboring race. It is always possible in such a case that while the superficial appearance of the specimen is most nearly like some one race (in this case *sinuosa*), its real affinities lie elsewhere; and that its peculiar characters may be due to an intermediateness of distribution in summer at present not understood. There are such large expanses of territory in the Pacific northwest where fox sparrows must occur and where no collecting has been done, and the manner of variation throughout the group is as yet so imperfectly known, that it is too much to be expected that the peculiarities of all winter specimens collected be perfectly understood.

Aside from these aberrant specimens there is no example of *sinuosa* at hand from any point between Prince William Sound and northern Oregon, though extensive collecting has been carried on at many places in this region. The inference to be drawn is that travel between summer and winter homes is for the greater part of the distance by one continuous flight with few or no stops.

Most California specimens of *sinuosa* come from inland points. There is evidently very little travel immediately along the coast, and only a small proportion of the birds winters in the coastal region.

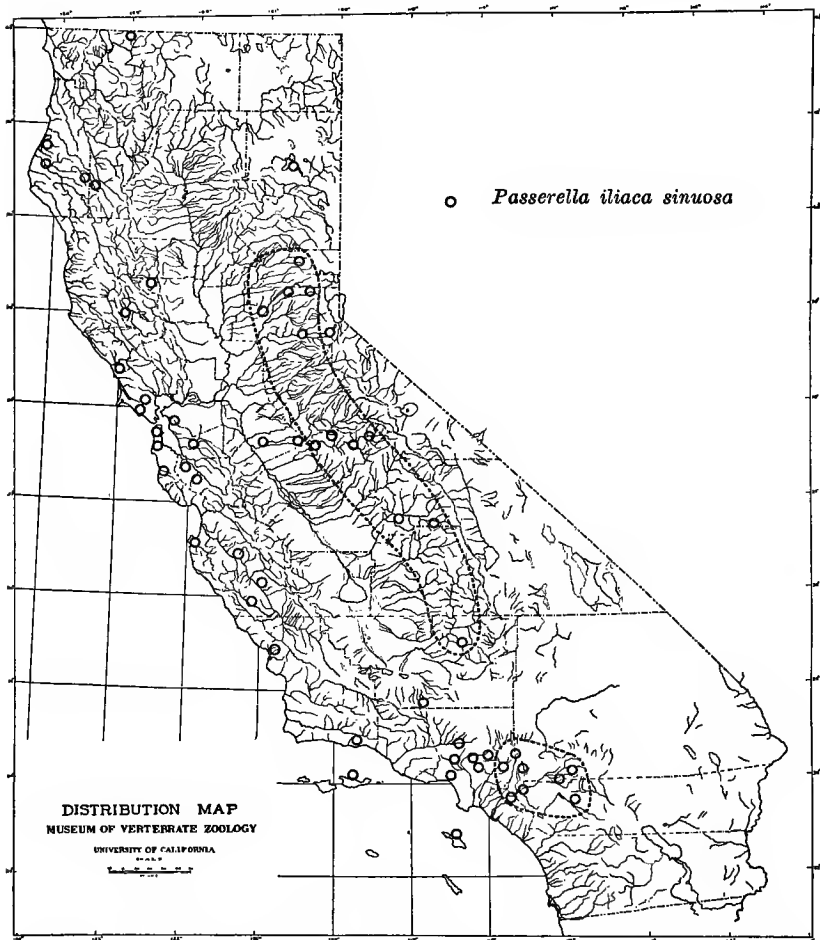


Fig. T. Map showing stations of occurrence of *Passerella iliaca sinuosa* in California, as established by specimens examined by the author. The regions enclosed within the dotted outlines are believed to comprise the main winter habitat of the subspecies. The stations outside these areas are points where the specimens of *sinuosa* taken were migrants, or, if winter visitants, where they formed but a small percentage of the total *Passerella* population.

From Humboldt Bay there are two or three migrating individuals and no midwinter birds; from Marin County, six winter specimens out of a total of 63 *Passerellas*, and one or two additional migrating

sinuosa; from the Santa Cruz region 28 wintering *sinuosa* out of 90 *Passerellas*. On the other hand, from points in the Sierra Nevada there are 23 wintering *sinuosa* out of a total of 51 *Passerellas*, and from the San Diegan region, 124 out of a total of 396.

An interesting feature of the winter distribution of *sinuosa* lies in the manner of its occurrence in the San Diegan region (see table 3). *Sinuosa* is the predominant winter fox sparrow in the foothills and cañons at the eastern extremity of the San Gabriel Mountains. An extensive series of *Passerella* from the Wright M. Pierce collection, mostly from San Dimas and San Antonio cañons, is available in the present study, and there are some additional birds from the same general region available from other sources. Out of a total of 178 winter specimens of *Passerella* from this section, 83 are *sinuosa*. Only 29 of the remaining 95 fox sparrows are representative of other subspecies of the Unalaschensis group (*unalaschensis*, *insularis*, and *annectens*). On the other hand, from the region about Pasadena and in the adjacent mountains, toward the western extremity of the San Gabriel Range, there are but nine wintering *sinuosa* out of a total of 80 *Passerellas*. Here *insularis* is the predominant form.

Specimens, to all appearances referable to *sinuosa*, from Corvallis, Oregon, in January, from Netarts, Oregon, in December and January, and from Mercer, Oregon, in February, are indicative of the wintering of at least occasional individuals as far north as this. There are a few winter birds at hand from scattered points in the interior of northern California: the Siskiyou Mountains, October 31; Clear Lake, December and February; Colusa, January; Eagle Lake, October 27. Undoubtedly, however, the main winter home of *sinuosa* lies in the foothills at the western base of the Sierra Nevada, and in parts of the San Diegan region.

The series from Prince William Sound includes specimens taken from June 25 to September 2. While this gives no clue as to the date of arrival on the breeding ground, it seems probable that the latter date, September 2, is close to the time of final departure for the south. Among the birds from California and Oregon there are scattered specimens that were secured upon dates affording some information regarding the time of arrival at the winter habitat and departure therefrom. Of autumnal arrivals in the Sierra Nevada there are birds from Sierra City, Sierra County, September 22; and from Horse Corral Meadow, Fresno County, September 21. This latter date may

be accepted with especial confidence as the date of arrival at that point on that particular year (1916), since fox sparrows had been assiduously sought for some time before. There is a specimen from Kunz, Trinity County, taken September 22; from the coast region there are specimens from Fortuna, Humboldt County, September 23, and from Oakland, Alameda County, September 28. The earliest date of arrival from southern California is Strawberry Valley, San Jacinto Mountains, September 28.

There are but few specimens at hand from California of later date than February, though occasional captures indicate that the last *sinuosa* does not leave for the north until much later. One bird from Santa Cruz Island was secured on April 27, much the latest date of capture in California shown in the series here available. Other late spring dates are: Newhall, Los Angeles County, March 4, Bolinas, Marin County, March 31, and Eureka, Humboldt County, March 3. From Oregon there are birds from Portland, Multnomah County, March 23, from Salem, Marion County, April 23, and from Warm Spring, Cook County, April 30.

Passerella iliaca annectens Ridgway

Yakutat Fox Sparrow

Original description.—*Passerella iliaca annectens* Ridgway, Auk, 17, Jan., 1900, p. 30.

Type specimen.—No. 170222, U. S. Nat. Mus.; male adult; Yakutat, Alaska, June 20, 1899; collected by R. Ridgway.

Range.—In summer on the coast of Alaska in the Yakutat Bay region; probably extends northwestwardly nearly to the eastern edge of Prince William Sound, southeastwardly about to Cross Sound. In winter restricted almost entirely to the immediate vicinity of the coast in central California, from Marin County south through Monterey County. A few stragglers reach southern California on the coastal slope.

Specimens examined.—170 (see list, pp. 194–197).

Distinguishing characters.—Of the *Unalaschcensis* group (see p. 89). In geographical position *annectens* lies between *sinuosa* and *townsendi*, and in its characters it forms a link between the two. Coloration is brighter, more ruddy than in *sinuosa*, not so dark as in *townsendi*; breast spotting less heavy than in *townsendi*. In fresh fall plumage, general coloration about cinnamon-brown; breeding birds have lost much of the bright, ruddy appearance of the fall plumage, and are duller in appearance. *Annectens* is of slightly smaller general size than *sinuosa*, *insularis* and *unalaschcensis*, to the northward, slightly larger than *townsendi*, to the southward (see table 4). Bill notably smaller than in *unalaschcensis* and *insularis*, slightly smaller than in *sinuosa* (see fig. S).

Remarks.—Vigors (1839, p. 19) described *Fringilla meruloides*, a species that "was met with at Monterey" by the naturalists of H.M.S. "Blossom." His description is brief, but evidently pertains to a fox sparrow, and to one of the *Unalascensis* group, although it is not sufficiently explicit to be pinned down to any one of the six subspecies within the latter aggregation. Therefore the proper application of the name *meruloides* rests to some extent upon outside facts, independent of the written description. Vigors gives no dates of occurrence, but the time at which the "Blossom" visited Monterey, as ascertained from Beechey's "narrative" (1831) was in January, and again in October and November, 1827. It was undoubtedly during the second visit (October 29 to November 17) that the natural history collections were made, but either stay was at the proper season to find fox sparrows there. No *Passerella* is known to breed in that region (see Grinnell, 1902, p. 44). Although Vigors' description cannot be used to distinguish between the several closely related subspecies concerned, it so happens that at Monterey there is one particular race that occurs in greater numbers than any of the others. The *Passerella* that winters there in such abundance is, as verified by comparison of specimens, the form breeding in the Yakutat Bay region, Alaska, named by Ridgway (1900, p. 30) *Passerella iliaca annexens*.

Collecting carried on at Monterey in December, 1901, by Grinnell (1902, p. 44) resulted in the capture of but the one subspecies; examination of additional specimens from the same general region showed these also to be of the same form. On this basis Grinnell (*loc. cit.*) pointed out that Vigors' name, *meruloides*, could be used with propriety for this subspecies, as apparently the only form occurring in the region. With this view the present writer was in perfect accord until a very recent date. When the writing of the present report was begun there were at hand seventeen fox sparrows from the vicinity of Monterey. Of these, fifteen were of the Yakutat Bay subspecies, one was *sinuosa* and one *insularis*, a representation of subspecies that bore out Grinnell's assertions, above indicated. A little later, however, additional material was received that put a different aspect upon the matter.

In December, 1918, Mr. H. G. White, of this Museum, spent some weeks collecting birds and mammals in the immediate vicinity of Monterey. As one result of his labors he sent in thirty-one fox sparrows. Of these, thirteen are of the Yakutat Bay race, sixteen are *sinuosa*, and there is one specimen each of *iliaca* and *megarhynchus*.

Altogether there are at hand forty-six fox sparrows from Monterey, including twenty-six of the Yakutat Bay race, seventeen *sinuosa*, and one each of *iliaca*, *insularis*, and *megarhynchus*.

The name *meruloides* can be applied to one particular subspecies only on the assumption that the chances are overwhelmingly against any other race having been taken at the specified locality. As shown by the recent collecting indicated above, while the one form is by far the most abundant in the region, there is at least one other that occurs in numbers. Altogether five subspecies are here recorded from that place. Under the circumstances it seems to me that there can be no absolute certainty as to the bird Vigors had in hand. On the contrary, it seems apparent that there is no alternative but to discard Vigors' name *meruloides* as undeterminable, as has been done by Ridgway (1901, p. 390). That name is replaced by *Passerella iliaca annectens* Ridgway (1900, p. 30), with type locality at Yakutat Bay, Alaska.

There is another angle to the question, in that the winter birds bearing the closest resemblance to Yakutat Bay specimens, both as regards color and bill structure, and making due allowance for seasonal changes in color, are those from Marin County. The Yakutat specimens at hand are all midsummer birds, taken a month or so prior to the molt, but I can not conceive that these birds, even in the freshest of plumage, ever presented the bright, ruddy appearance so frequently seen in fall and winter specimens from the vicinity of Palo Alto and of Monterey Bay. These latter seem to present an extreme of differentiation within this subspecies, both as regards bright color and increased size of bill. Discovery of a definable summer range of birds with these characters may necessitate the recognition of still another race, with *annectens* occurring at Yakutat Bay in summer, and mainly in the region immediately north of San Francisco Bay in winter. At present, however, no such division can safely be made, but the birds from the several points indicated must all be lumped as exemplifying the range of variation within the one subspecies.

In the series of *Passerella* here accumulated, *annectens* is abundantly represented from many points near the coast, from Sonoma County south through Monterey County, and by strikingly few specimens from other parts of the state. Although this is such a common winter bird in the San Francisco Bay region and in Marin County, to the northward, it is almost entirely absent from the California coast region but a little way farther north. In an extensive series of fox sparrows from the Humboldt Bay region, but one example of

annectens was discovered. This bird, taken September 20, was probably a migrant at this point. Two others specimens, from Logan, Oregon, March 18, and from Tacoma, Washington, November 10,

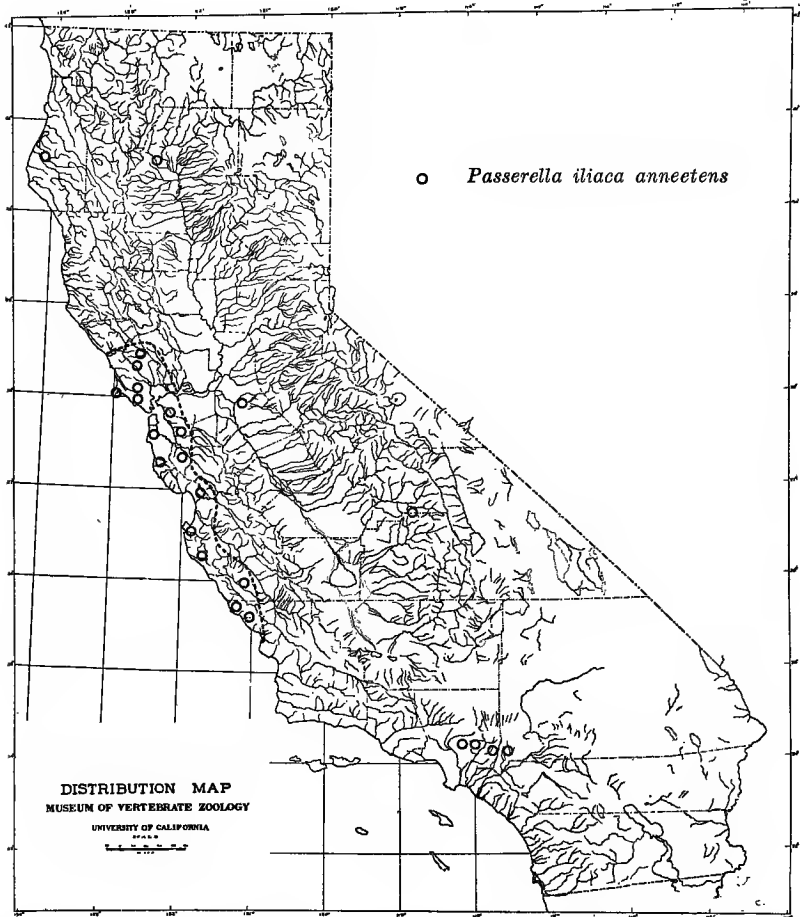


Fig. U. Map showing stations of occurrence of *Passerella iliaca annectens* in California, as established by specimens examined by the author. The region enclosed within the dotted outline has been satisfactorily demonstrated to be the main winter habitat of the subspecies.

indicate at least the occasional appearance of the subspecies at these points, but in all probability it is of uncommon occurrence there.

In the winter metropolis, the coastal region of central California, dates of occurrence range from September 25 (Sebastopol, Sonoma County) to April 19 (Hayward, Alameda County). In southern

California, specimens have been taken from October 22 (Arroyo Seco, near Pasadena) to February 14 (San Dimas Cañon). The only inland points where specimens have been taken are Hume, Fresno County (in the Sierra Nevada at 5300 feet), September 26, at Stockton, San Joaquin County, November 28, and at Tower House, Shasta County, March 8, one specimen at each place. Specimens of *annectens* from Clayoquot, Vancouver Island, September 17, from Kalama, Cowlitz County, Washington, October 18, and from Beaverton, Washington County, Oregon, from February 25 to April 22, are presumably migrants.

It is a point worth noting that not only are the limits of the winter habitat sharply defined and not only are by far the greater number of these birds found in this habitat, but also a large proportion of the stragglers found elsewhere are not absolutely typical of the subspecies. Intergrades occur, linking *annectens* with *sinuosa*, on the one hand, and with *townsendi*, on the other, and many of the individuals taken outside the usual winter habitat are of such equivocal character, though referred to *annectens* as the form they most nearly approach.

Passerella iliaca townsendi (Audubon)

Townsend Fox Sparrow

Original description.—"Plectrophanes townsendi Audubon, Birds Amer. (folio), volume IV, part 85, plate 424, figure 7, engraved, printed and colored by Robert Havell, 1838.

"*Fringilla townsendi* Audubon, Ornithological Biography, vol. V, p. 236, 1839. 'Shores of the Columbia River.' ""*

Type specimen.—No. 2874, U. S. Nat. Mus.; female adult; Columbia River, Oregon; February 15, 1836; collected by J. K. Townsend.

Range.—In summer the coast region of southern Alaska, on islands and mainland, from Glacier Bay and Lynn Canal south to Forrester Island; also on the Queen Charlotte Islands, British Columbia.

In winter south on the coast of northern California; to Humboldt Bay, abundantly, to the San Francisco Bay region in small numbers. One specimen from Arizona.

Specimens examined.—155 (see list, pp. 197–199).

* These references are copied verbatim, as given me by Mr. W. H. Osgood, Assistant Curator, Mammalogy and Ornithology, Field Museum of Natural History, from copies in the library of that institution, the works cited not being available for my own personal inspection. I wish here to express my appreciation of his courtesy in supplying me with the needed references. Authors in citing the original description of this subspecies give sometimes one and sometimes the other of the above volumes, or a mixture of the two under one heading (cf. A. O. U. Check-List, 1910, p. 278; Ridgway, 1901, p. 393), a procedure that is apt to cause confusion where the actual circumstances are not understood.

Distinguishing characters.—Of the Unalascensis group (see p. 89). Compared with the subspecies to the northward, *unalascensis*, *insularis*, *sinuosa*, and *annectens*, coloration is much darker, more rufescent, spots on breast larger and more crowded. Compared with *fuliginosa*, to the southward, *townsendi* is brighter colored, less sooty. General size slightly less, and size of bill appreciably less than in *unalascensis*, *insularis*, and *sinuosa*, slightly less even than in *annectens* (see table 4). An average fall specimen just through the molt, in general coloration of upper parts (head, neck and back) is close to bister. Spring birds are appreciably paler colored, about vandyke brown.

Remarks.—The Townsend fox sparrow is a notable example of a bird with a winter habitat nearly as sharply defined as its summer home. In the Humboldt Bay region of California it is an abundant winter visitant, but even here it is evidently restricted to a narrow strip of territory immediately adjoining the coast. Of forty-six fox sparrows examined from the Humboldt Bay region taken during the winter months, forty are *townsendi*; of sixty examples of *townsendi* taken in California (migrants and winter visitants), forty-nine are from the Humboldt Bay region. From these figures it is apparent that in California *townsendi* is closely confined to this particular region; it is also evident that it is the predominant form of *Passerella* there. The only other fox sparrows I have seen from that section are a few winter visitant *fuliginosa*, as listed beyond, several migrating *sinuosa*, and one migrating *annectens*. The last mentioned subspecies is so abundant a winter visitant to the California coast to the southward, in the regions about San Francisco and Monterey bays, as to make its rarity at Humboldt Bay a matter of surprise and of evident significance. Conversely, the subspecies *townsendi* is almost as rare in the winter metropolis of *annectens*. The winter habitats of the two forms are nearly as sharply defined as the breeding ranges, and there is very little straying on either side.

The summer home of the Townsend fox sparrow includes a long stretch of coast in southeastern Alaska, but the bird apparently is not continuously distributed throughout this area. The 1907 Alexander Alaska Expedition found this subspecies breeding at Glacier Bay (about the northern limit of the form), and at various points on Admiralty, Baranof, and Chichagof islands (see Grinnell, 1909, p. 232). The 1909 Alexander Alaska Expedition did not find the bird on any of the more southern islands of the Alexander Archipelago, nor at the more southern mainland points touched upon (see Swarth, 1911, p. 93). It is, however, known to be a common summer visitant to

Forrester Island, near the southern extremity of the Alexander Archipelago, and there is a June specimen at hand from Wrangell Island, where I myself failed to find it. Specimens from Howkan, Long Island, taken March 29 and April 6, were probably newly arrived migrants, but one secured there on April 27 may well have been upon its nesting ground. The available facts, however, all things considered, point to a rather uneven distribution within the known summer habitat.

The specimen above mentioned as secured at Howkan (near the southern extremity of the Alexander Archipelago) on March 29, is probably representative of as early a date of arrival upon the breeding grounds as usually occurs. The Townsend sparrow was plentiful on Admiralty Island by April 17, and eggs were found there on May 3 (Grinnell, *loc. cit.*). The present writer found the subspecies abundant at Port Snettisham (on the mainland opposite Admiralty Island) at the end of August; as birds in juvenal plumage were secured the inference is that they were upon their breeding ground. Townsend fox sparrows were seen on the Taku River early in September. The last was noted September 19; as the writer remained in that region until the end of September without seeing another one, that date may be assumed to indicate the final departure for the year (Swarth, *loc. cit.*) The first arrival in the winter home may be represented by a bird (no. C. 292, Dickey coll.) taken at Fortuna, Humboldt County, California, September 19. There is another specimen at hand (no. 2432, Emerson coll.) from Haywards, Alameda County, California (near the southern limit of the subspecies), taken September 20. The latest date in the spring represented in the available series is of a specimen (no. 21, Dickey coll.) taken at Eureka, Humboldt County, California, on March 3. It is very probable, however, that this subspecies really has not finally departed for the north until some weeks later.

In California, as noted, the Townsend fox sparrow is quite closely restricted to the Humboldt Bay region. Additional specimens from scattered points in Sonoma, Marin, Alameda, and San Mateo counties are in some cases typical examples of *townsendi*; in others they show an obvious tendency toward *annectens*. As no stray specimens of *townsendi* have appeared among the hundreds of fox sparrows examined from southern California, the occurrence of an individual of this subspecies from a point in southeastern Arizona seems doubly strange. There is, however, one specimen at hand (no. 3178, Law coll.) collected

in Pinery Cañon (altitude, 6000 ft.), Chiricahua Mountains, Arizona, November 28, 1914, that so closely resembles typical *townsendi* that it must perforce be placed in that category. It is a trifle duller colored, less richly brown, than Alaskan specimens, but the difference is slight.

The series of *townsendi* from throughout the breeding range is on the whole notably uniform in appearance, despite the segregation of the birds on different islands. From the northern extreme, Glacier Bay, there are, unfortunately, but two juveniles available. These are not appreciably different from young from other points, and they are unlike the one juvenal *annectens* at hand, but the material is too scanty for a decision as to the existence of a tendency toward *annectens* at this point. Birds from Forrester Island, an outlying island near the southern boundary of Alaska, do not depart appreciably from the mode of *townsendi*, nor, as far as I can see, do those from the Queen Charlotte Islands, still farther south. A series of the last mentioned was reported upon by Osgood (1901, p. 48), who remarks that the birds "are not identical with breeding birds from Sitka, and perhaps should be considered intermediate between *townsendi* and *fuliginosa*." I do not know the amount of comparative material that was available when that report was written, but in the light of the extensive series now assembled, the Queen Charlotte Islands specimens can not be regarded as outside the range of variation seen elsewhere in the habitat of *townsendi*. They certainly show no appreciable approach toward *fuliginosa*, though such variation would not have been surprising.

Birds in fresh fall plumage from the Taku River and Port Snettisham are notably dark-colored as compared with breeding birds from neighboring islands (see Swarth, 1911, p. 94), and this darkness is also apparent in comparison with a September bird from Sitka. There is a fall specimen at hand taken at another point on Baranof Island (Peril Strait) of the same dark type of coloration as is seen on the mainland birds.

The type specimen of *Plectrophanes townsendi* Audubon has been available for the present study. This is a well made skin, considering the period at which it was collected, and in good condition. Taken late in the winter (February 15) the condition of the plumage would not be noticeably different from birds collected six weeks later upon the breeding ground, and to my eye the coloration of this specimen is not appreciably different from selected specimens from the Alex-

ander Archipelago and the Queen Charlotte Islands. There can be no shadow of a doubt as to the applicability of the name *townsendi*.

The only label upon the skin (besides the red "type label") was

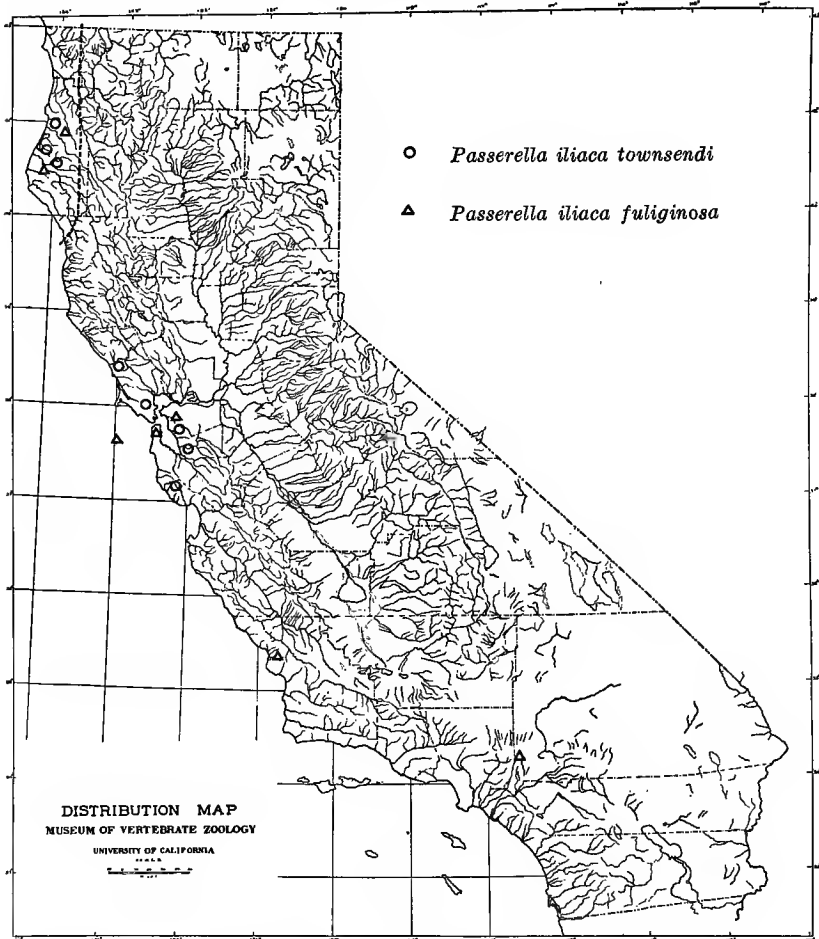


Fig. V. Map showing stations of occurrence of *Passerella iliaca townsendi* and *P. i. fuliginosa* in California, as established by specimens examined by the author: The region enclosed within the dotted outline has been satisfactorily demonstrated to be the only part of California visited commonly by *townsendi*; it is evidently the southern extremity of the normal winter habitat of the subspecies. *Fuliginosa* is of little more than casual occurrence in California.

presumably attached to it by Professor Baird. Upon the face of the label the words "Smithsonian Institution, Washington, D. C." have been crossed out with a pen, and "Coll. of S. F. Baird" written in. Upon the back of the label are written the words "From Audubons

Coll. Property of S. F. Baird." The locality of capture, Columbia River, Oregon, must necessarily be regarded as established by the statement in the original description, rather than that upon the label, which must have been attached at a much later date.

Passerella iliaca fuliginosa Ridgway

Sooty Fox Sparrow

Original description.—*Passerella iliaca fuliginosa* Ridgway, 1899, p. 36.

Type specimen.—No. 157611, Biol. Surv., U. S. Dept. Agric.; male adult; Neah Bay, Clallam County, Washington; June 10, 1897; collected by E. A. Preble; original number 319.

Range.—Imperfectly known. In summer known to occupy parts of Vancouver Island and northwestern Washington; presumably the mainland coast of southern British Columbia also. In winter non-typical birds occur in small numbers along the coast as far as San Francisco Bay, rarely to southern California.

Specimens examined.—39 (see list, pp. 199–200).

Distinguishing characters.—Of the *Unalascensis* group (see p. 89). Much darker than any of the other subspecies, and also more heavily marked. One specimen at hand in freshly acquired winter plumage is about clove brown on the head, and very slightly more castaneous on the lower back. The lateral under surface of the body and the spots on the breast are dull and sooty, with hardly an indication of reddish. In general size *fuliginosa* is slightly larger than *townsendi*.

Remarks.—This is one of the least known of the subspecies of fox sparrows. Its summer home is in a region where relatively little bird collecting has been done; its migrations at any season are extremely limited, and do not carry it into regions where specimens are much more likely to be taken than in the summer habitat. As a result there are but few skins in collections.

Owing to the diversity of appearance exhibited by the specimens, the series here assembled, small though it is, raises certain questions that can not be answered prior to the accumulation of much additional material. The type specimen of *fuliginosa* (a summer bird from northwestern Washington) possesses a relatively long and slender bill. This is seen also in the more fully grown young birds from Vancouver Island, and again in some winter specimens from Vancouver Island. Other winter birds from the latter place, however, though of dark coloration and with the heavy markings of *fuliginosa*, have noticeably short, stubby bills. Winter birds from California, though here listed under the name *fuliginosa*, are so placed by the

author reluctantly and with a strong sense of dissatisfaction. They are certainly dark colored, but of a duller tone than in typical *fuliginosa*, they are not so heavily marked below (that is, the streakings are less crowded), the under tail coverts are more nearly whitish, and they all have stubby bills. There are no specimens available from the mainland coast of British Columbia, and I have consequently no knowledge of the characters of the birds of that region. The nature of variation that may be assumed to exist at the outskirts of the range of *fuliginosa*, perhaps showing intergradation between *fuliginosa* and *townsendi*, perhaps between *fuliginosa* and *altivagans*, and *fuliginosa* and *schistacea*, is entirely unknown, and until series of specimens are gathered from many points where such intergrades are to be looked for, and the summer habitats of the several subspecies concerned consequently platted in much greater detail than is now possible, there is little to be gained by speculation as to the nature and origin of the puzzling winter birds above described. It may be said with all certainty, however, that the California winter visitants here included under *fuliginosa* were *not* migrants from northwestern Washington or Vancouver Island. With the exception of one or two specimens from Humboldt Bay they do not even approach typical *fuliginosa* very closely in appearance; they are placed in that category because their characters are such as to indicate a closer affinity to *fuliginosa* than to any other form, and probably illustrate intergradation between *fuliginosa* and some one of the adjacent subspecies.

In what little is known of the summer habitat of *fuliginosa* there are certain apparent inconsistencies of occurrence. Dawson (1909, p. 152) found this subspecies breeding upon the San Juan Islands, Puget Sound, but the present writer did not meet with it at the lower levels of the closely adjacent southeastern portion of Vancouver Island. Here it was discovered breeding in the Canadian Zone of the higher mountains, from 2200 feet altitude upward. Farther north on Vancouver Island, at Nootka Sound, however, it was seen at sea level (Canadian Zone) (Swarth, 1912, p. 62). While Dawson (1909, p. 155) defines the summer habitat in Washington as on "the north and west slopes of the Olympic Mountains, together with the islands of Lower Puget Sound," a list of the birds of the Lake Crescent region, Olympic Mountains, by Rathbun (1916) includes no mention of *Passerella*.

The present writer collected four specimens of *fuliginosa* in the summer habitat on Vancouver Island. Three are in juvenal plumage.

and one in almost complete first winter plumage. The last mentioned (no. 16253, Mus. Vert. Zool.), in perfectly fresh, unfaded plumage, is of intensely deep brown coloration, about clove brown on the head, and very slightly more castaneous on the lower back. It is much more heavily marked below than is the case in *townsendi*, the dark markings being so nearly confluent across the breast that in this case it is the white ground color that shows through as interrupted markings. The lateral under parts and the dark spots on the breast are dull and sooty, with but a suggestion of reddish.

The three juveniles exhibit some diversity of color. In the darkest of them (no. 16252, Mus. Vert. Zool.) the general coloration is bister, as compared with snuff brown in typical young *townsendi*; the markings below are so extensive, and the ground color so very little paler than these markings, that it appears almost "solid" brown below. The other two young (nos. 16251, 16254) are less heavily marked and not so dark-colored, but they are still appreciably darker than *townsendi* at the same stage.

Fuliginosa (speaking now of the non-typical birds previously described) is a rare winter visitant to the northern coast region of California. The earliest arrival noted is one from Fortuna, Humboldt County, September 19; the latest in the spring, one from southeast Farallone Island, May 31. As the subspecies had been represented in local collections heretofore only by an occasional specimen (nearly all from the Humboldt Bay region, included among large series of *townsendi*), it was rather unexpected that in the fall of 1918 there should be a sudden influx of the birds into the San Francisco Bay region. On October 1, 1918, R. M. Hunt, of the Museum of Vertebrate Zoology, noted numbers of fox sparrows in the hills east of the University Campus. The following day he returned to the place and collected six of the birds. Four of the six proved to be *fuliginosa*. On October 18 four more fox sparrows were collected at the same place, and three of them were *fuliginosa*. Later collecting failed to disclose more of these dark-colored birds. On September 26, 1918, J. Grinnell collected an immature female *fuliginosa* at Morro, San Luis Obispo County. In the light of these several captures, and considering the absence of the subspecies in the extensive series of fox sparrows available and collected in the San Francisco Bay region during previous years, there seems to be evidence of a rather unusual "wave" of this bird. There are certain other birds, more conspicuous in actions and appearance (the varied thrush is a good

example) that we know to vary in numbers from year to year, and it may be that among the subspecies of the fox sparrows also there is this question of fluctuating numbers (or even total absence some winters compared with relative abundance during others) to make still more complicated the already involved problem of the migration and distribution of the different forms.

One specimen of *fuliginosa* at hand (no. 27153, Mus. Vert. Zool.), like the Berkeley birds in appearance, was taken at Bear Flat, San Antonio Cañon, San Gabriel Mountains, California, on November 30, 1916. This is by far the southernmost record for the subspecies.

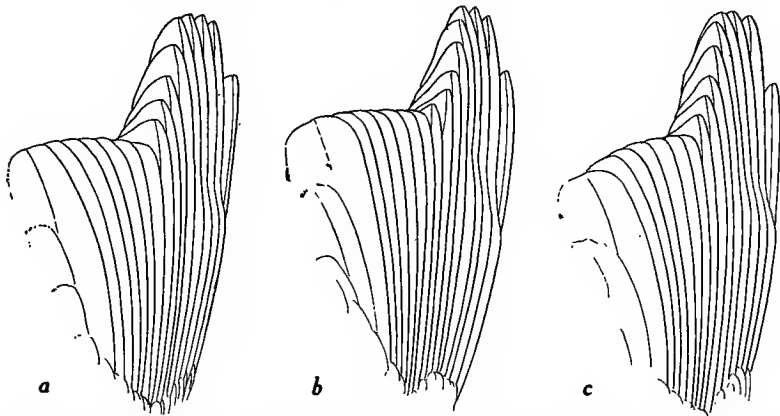


Fig. W. Wings of three subspecies of fox sparrow of the Schistacea group, natural size.

a. *Passerella iliaca schistacea*, adult male; no. 9054, Mus. Vert. Zool.; Pine Forest Mountains, Nevada; June 19, 1909.

b. *Passerella iliaca mariposae*, adult male; no. 29089, Mus. Vert. Zool.; Sisson, Siskiyou County, California; May 15, 1918.

c. *Passerella iliaca stephensi*, adult male; no. 3426, coll. G. F. Morcom; Bear Valley, San Bernardino Mountains, California; June 10, 1886.

Passerella iliaca schistacea Baird

Slate-colored Fox Sparrow

Original description.—*Passerella schistacea* Baird, 1858, p. 490.

Type specimen.—No. 5718, U. S. Nat. Mus.; female; "Platte river, K. T." (= "South Fork of Platte River, about 25 miles east of northeastern corner of Colorado, Nebraska" [A. O. U. Check-List, 1910, p. 277]); July 19, 1856; collected by Lt. F. T. Bryan (original number 131).

Range.—The summer habitat is principally in the high mountains of the Great Basin region, north into Alberta, south into Nevada and east probably to eastern Wyoming. In winter south to southern California and (casually, at least) to southern Arizona. Occasional in migration in western Nebraska and Kansas.

Specimens examined.—98 (see list, pp. 200–201).

Distinguishing characters.—Within the Schistacea group (see p. 89), *schistacea* is distinguished from all the other subspecies save *canescens* by its diminutive bill (see figs. E, F, and table 4). From *canescens*, *schistacea* is distinguished by its more slender pointed, less stubby bill, and by color, *canescens* being more grayish in general coloration; *schistacea* more brownish. In an average example of *schistacea* in fresh fall plumage (no. 23203, Mus. Vert. Zool., Blue Cañon, Placer County, California, August 31, 1912) the upper parts generally are overlaid with brownish, the general effect being not far from sepia, while the ventral spots, each one blackish centrally, are laterally of a richer brown than the back. By April much of the brownish tinge has disappeared through wear and fading, but direct comparison of specimens of *schistacea* and *canescens* shows an appreciable difference, still, in this regard. In juvenal plumage *schistacea* exhibits throughout a brownish suffusion, just such as is seen in the later stages.

Remarks.—The type specimen of *Passerella schistacea* Baird was collected upon the expedition headed by Licut. Francis T. Bryan in exploration of a road from Fort Riley to Bridger's Pass in the summer of 1856. The locality of capture of the specimen as entered upon the label is simply "Platte river, K. T.," the date, July 19, 1856. The itinerary of Lieut. Bryan's party appears in a report contained among "The executive documents printed by order of the senate of the United States" (1858, pp. 455–457); and there is a map showing the route the party traversed, in the Annual Report of the Wheeler Survey (1876, opp. p. 36). In the itinerary, unfortunately, a detailed account of day to day travel begins only on July 23, but by comparison of the less detailed statements just preceding this date, with the table of distances (pp. 485, 486) a fairly accurate idea may be reached of the whereabouts of the party on July 19. On that day, from the above data, they would seem to have been traveling along the South Platte River, probably between Laramie Crossing and Goodale's Crossing, approximately two hundred miles west of Fort Kearny. This would fix the type locality of *schistacea* at about the point given by Cooke (1897, p. 107), upon the authority of Dr. T. S. Palmer, and as repeated by the A. O. U. Check-List (1910, p. 277). The latter authority gives it as "South Fork of Platte River, about 25 miles east of northeastern corner of Colorado, Nebraska." I myself, after studying the documents above mentioned, did not feel able to fix the locality quite so exactly, but it is, apparently, in Nebraska and on the South Platte River, not many miles east of the Nebraska-Colorado boundary line. It should be stated that on the map above cited the

only part of Lieut. Bryan's route that is clearly labelled as such is the stretch between the South Platte River in northeastern Colorado and the Solomon River, Kansas, the homeward route taken by the party later in the summer.*

The type specimen of *schistacea* is an adult female in badly molting condition, of little value for color comparisons. The subspecies is evidently rare in Nebraska and in the adjacent portions of Colorado and Wyoming, and it is improbable that this bird was breeding at the place where it was taken. From the account in Bryan's itinerary, above cited, the headwaters of Lodgepole Creek (which empties into the South Platte not far west of the point of capture) would seem a not unlikely breeding ground for *Passerella*, so it may be that this bird had strayed down that stream, and then down the South Platte.

In Baird's original description of *Passerella schistacea* (1858, p. 490), his comments were applied to a series of specimens that included two or more distinct subspecies, as now understood. As far as the description itself is concerned, both the small-type paragraph headed "Sp. Ch." and the general comments following, all laying stress upon the great size of the bill, as compared with *iliaca*, apply to the bird he later called *megarhynchus*, and not to the small-billed bird for which the name *schistacea* has been generally used. The definite statement is made, however, that: "The essential characters of the preceding diagnosis are based on a specimen (5118) from the head of the Platte, and collected by Lieutenant Bryan, in 1856." It was a curious slip to have made, especially by as keen an observer as Baird, for it is literally impossible that a comparison of Bryan's specimen from the Platte with examples of *iliaca*, could have inspired a diagnosis of the former containing the statement: "Bill very thick; the upper mandible much swollen at the base."

It seems as though the descriptive paragraphs had been based upon Fort Tejon specimens, and the comment upon the Platte specimen inserted at some later time. It may, perhaps, have been put in with an idea of defining the geographic range of the species.

However that may be, and however definitely every sentence in the diagnosis applies to the California bird, there is no doubt that the statement above quoted fixes the type of *schistacea* as being the Platte River specimen. In addition to this there is Baird's action in an appendix to the volume containing the description of *schistacea*, where

* I am indebted to Dr. T. S. Palmer, of the United States Biological Survey, for putting me upon the track of the accounts from which the above statements are taken.

he applies the name *megarhynchus* to birds from Fort Tejon (1858, p. 925), and specifically mentions the Platte River specimen as the type of *schistacea*.

Judging from the variation exhibited by the birds assembled for this study, it seems possible that the name *schistacea*, even as here restricted, covers a composite of two or more recognizable subspecies. That such is the case, however, is not capable of proof by the examination either of winter birds alone, or of the few summer birds available, which represent but a limited number of localities. The general summer range of *schistacea* consists of many scattered high mountain localities, more or less widely separated, and it would not be surprising should some of the isolated colonies thereon prove to be as distinguishably different from normal *schistacea* as is *canescens*.

The rather extensive series of summer specimens from the Pine Forest Mountains, Nevada, are apparently similar in character to the type specimen of *schistacea* and to summer birds from the vicinity of Fort Bridger, Wyoming. *Schistacea*, proper, is thus primarily a bird of the Great Basin. Birds of this type are of distinctly brownish coloration, as compared with *canescens* (both adults and juvenals), and, in the extreme of differentiation from that race, have a notably longer, more slender pointed bill. In midsummer plumage the presence of the brown coloration is usually obscured by wear and fading, but molting birds from the Pine Forest Mountains show it unmistakably in the new-coming feathers. Most California winter taken specimens are evidently of this same type, slender-billed, and more brown of color than *canescens*. There is a small proportion of skins, from various scattered localities, that have this brown coloration carried to an extreme, nearly as much so as in some of the *Unalascensis* group, from which, however, they are readily distinguished by other characters. The capture of one of these extremely rufescent birds at Anthony, Baker County, Oregon (October 11), suggests the possibility of the summer habitat of this type lying somewhat farther to the northward, or perhaps it is an indication of intergradation between *schistacea* and *altivagans*. In support of this supposition attention may be drawn to a series of summer birds from Banff, Alberta (coll. Victoria Mem. Mus.). As compared with the Pine Forest Mountains series, the Banff birds are much more heavily marked below, and of appreciably browner coloration. One specimen in particular (no. 1175) is notably rufescent, and with a faint suggestion of streaking above. On the other hand, a specimen from a neighboring locality

(no. 100358, Amer. Mus. Nat. Hist., Ptarmigan Lake, near Laggan, Alberta), is not appreciably different in coloration from the Nevada birds. The Alberta specimens are short-tailed, as compared with those farther south, this again being undoubtedly an approach toward *altivagans*.

Schistacea occurs in California as a migrant and winter visitant, the specimens at hand indicating the occurrence of this subspecies over a large part of the state, though it is not a common bird at any point. The line of migration extends along the Sierra Nevada, with the main winter home in California in the San Diego region. There are many records from the Sierras extending from August to November, and a lesser number during March and April. One individual from Mariposa County, November 29, might have been supposed to be in its winter home, but Tyler (1913, p. 85), speaking of the occurrence of this subspecies in the Fresno district (south of Mariposa County), asserts that while some of the birds remain until December, they all depart during this month, presumably for points still farther south.

There is one winter bird (December 5) from the Piute Mountains, at the southern extremity of the Sierra Nevada, while from the San Diego region there are many specimens taken during December, January, and February. These winter birds are all from points west of the divide that separates the Pacific slope from the desert, though there is no reason to doubt that the subspecies winters also on the desert slopes of these same mountains. The northernmost winter specimen at hand from the coast region is from Nordhoff, Ventura County, and there are many points of capture from that station south practically to the Mexican boundary. The subspecies has not as yet been reported from any of the islands off the coast of southern California, nor from any locality north of Ventura County and west of the San Joaquin and Sacramento rivers.

The earliest arrival in the fall is one taken at Blue Cañon, Placer County, August 31, though others have been secured far to the south of this but a few days later—at Cottonwood Lakes, 11,000 feet altitude, Inyo County, September 3, and at Lytle Creek, San Bernardino County, September 2. In Kings River Cañon, in 1916, slate-colored fox sparrows were migrating in small numbers the middle of September, the first taken on September 12, though others, believed to be of the same subspecies, had been seen on the 10th. A few days later, at Horse Corral Meadow, a high ridge just south of the Cañon, the

migration was evidently in full swing, and specimens of *schistacea* were shot from time to time along with several other subspecies of *Passerella*. The latest taken specimen in the spring is one from Ojai

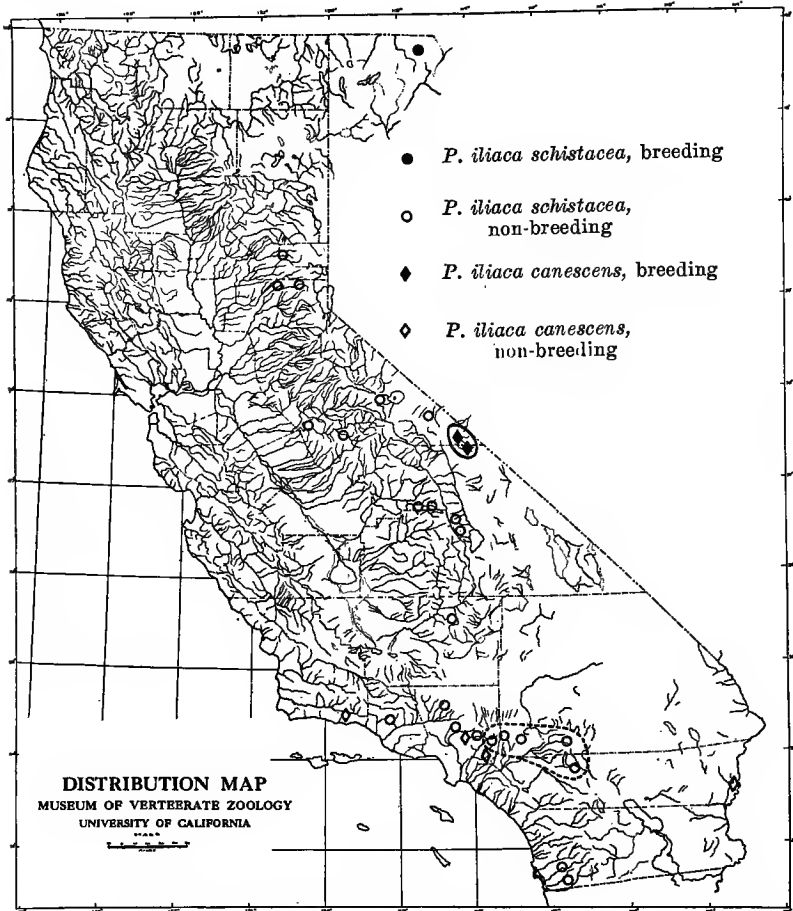


Fig. X. Map showing stations of occurrence of *Passerella iliaca schistacea* and *P. i. canescens* in Nevada and California, as established by specimens examined by the author. The portion of southern California enclosed within the outline is believed to be the main winter habitat of *schistacea* in this state. Note the general avoidance of the coastal region.

Valley, Ventura County, April 25. In the vicinity of Lone Pine, Inyo County, in 1912, slate-colored sparrows were seen daily about the middle of April, migrating northward, specimens being secured from April 10 to 16.

The capture of an individual of this subspecies in midsummer (July 3, 1908) in the San Jacinto Mountains, Riverside County, California, remains an anomalous occurrence, difficult to understand (Grinnell and Swarth, 1913, p. 281).

There are four specimens of *schistacea* available from Arizona. The winter range of *schistacea* is generally given as including Arizona and New Mexico (cf. A. O. U. Check-List, 1910, p. 277; Ridgway, 1901, p. 396), but the published records of occurrence in the former state hardly suffice as a basis for the statement. I know of but four such locality records: forty miles south of Camp Apache, September 1, 1873, one specimen (Henshaw, 1875, p. 293); San Francisco Mountain, September 29, 1889, one specimen (Merriam, 1890, p. 97); Huachuca Mountains, November 20, 1894, one specimen (Fisher, 1904, p. 81); Big Sandy Creek, near Signal, Mohave County, February 6 and 9, 1880, three specimens (Stephens, 1914, p. 259). Brewster's (1882, p. 197) record from Tucson was a mistake, as pointed out by Stephens (*loc. cit.*).

The additional specimens now at hand are two from the Sierra Ancha, Gila County, November 7 and 12, 1916 (nos. 1803, 1804, coll. G. Willett), one collected by A. Van Rossem in Bonita Cañon, Chiricahua Mountains, January 24, 1915 (no. 3179, coll. J. E. Law), and one taken by Dr. E. A. Mearns at Payson, Yavapai [= Gila?] County, February 18, 1888 (no. 52996, Amer. Mus. Nat. Hist.). It may be only due to the failure to collect in the proper localities that the subspecies has not been found to be of regular and abundant winter occurrence in Arizona, but on the basis of the above mentioned specimens (all that are known to me as occurring in that state), *schistacea* can hardly be regarded as of much more than casual occurrence.

The four Arizona specimens at hand are in appearance essentially like the breeding bird of northern Nevada, and are probably migrants from that general region.

Passerella iliaca fulva Swarth

Warner Mountains Fox Sparrow

Original description.—*Passerella iliaca fulva* Swarth, 1918, p. 162.

Type specimen.—No. 14795, Calif. Mus. Vert. Zool.; adult male; Sugar Hill (5000 feet), Warner Mountains, Modoc County, California; May 19, 1910; collected by W. P. Taylor and H. C. Bryant; original number 2887.

Range.—In summer the extreme northeastern corner of California, in the mountains of Modoc and Lassen counties; north into central Oregon; east of the Cascades. The northernmost specimen at hand is from Warm Spring, Crook County, the easternmost from Burns, Harney County. Winter home unknown.

Specimens examined.—89 (see list, pp. 201–202).

Distinguishing characters.—Of the Schistacea group (see p. 89). Bill intermediate in size between *schistacea* and *mariposae*; of about the same size as in *monoensis*, but more slender and attenuated than the short and rather heavy bill of that subspecies (see fig. F). Coloration more brownish than in *mariposae* and *monoensis*; about as in *schistacea*. Wing and tail measurements somewhat less than in *mariposae*, about the same as in *schistacea* (see table 4).

Remarks.—Size of bill will suffice to distinguish *fulva* from any of the other fox sparrows of the Schistacea group save *monoensis*. From the latter form *fulva* may be told by the somewhat differently shaped bill, and by difference in coloration. In worn summer plumage color differences are more or less obscured, but in freshly molted fall specimens they are readily apparent.

The large series of breeding birds at hand from the Warner Mountains, California, is quite uniform in appearance throughout. Breeding birds from various points in central Oregon exhibit considerable diversity in size and shape of bill and in relative grayness and brownness of color, though all, I believe, are best referred to *fulva*. This variation is in accordance with the geographical position of the several specimens, showing different degrees of intermediateness between *fulva*, *schistacea*, and *mariposae*. Birds from extreme southern Lake County are typical *fulva*. One specimen from Burns, Harney County, the easternmost point represented, in size of bill approaches *schistacea*. Examples from Fort Klamath and Sisters, the westernmost points of record, have larger bills, apparently tending toward *mariposae*. These latter specimens also are decidedly grayish in color, as compared with Warner Mountains birds, in this respect again showing an approach to *mariposae*.

There is an abundance of breeding specimens of *fulva* at hand, and from enough different localities to give a fairly accurate idea of the summer habitat of this form, but there is practically no material that would serve to shed light on migration route and winter home. There is a specimen in the Mailliard collection (no. 4253), a typical example of *fulva*, collected at Eagle Lake, Lassen County, October 1, 1899; and one in the collection of Allan Brooks, collected by A. Van Rossem

at Sierra City, Sierra County, October 6, 1911. These would indicate a rather late tarrying near the summer habitat. An immature male (no. E. 301, coll. D. R. Dickey) taken at Lawson (= Lassen) Creek, Modoc County, August 23, is so different from midsummer birds of the same age and stage of plumage from the near-by Warner Mountains, that, although I include it under the name *fulva*, I believe that it was a migrant at the point of capture, probably from somewhere in central Oregon. It has the gray coloration and the type of bill seen in birds from that region.

There is one specimen in the Emerson collection taken in the Volcan Mountains, San Diego County, February 9, 1884. This bird

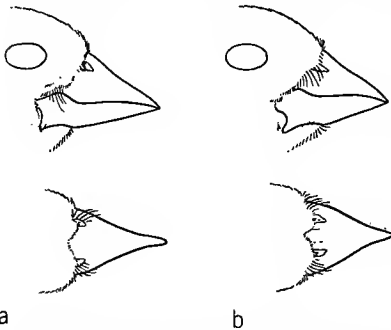


Fig. Y. Bills of two subspecies of fox sparrow, natural size.

a. *Passerella iliaca mariposae*, adult female; no. 25691, Mus. Vert. Zool.; Yosemite Point, Yosemite Park, California; June 4, 1915.

b. *Passerella iliaca megarhynchus*, female; no. 12402, U. S. Nat. Mus., type specimen; Fort Tejon, Kern County, California.

is unquestionably *fulva*. It can be very closely matched by selected specimens from the Warner Mountains (allowing for the different degrees of wear on the feathers), and it is absolutely the only specimen of which this can be said, that has come to light among the hundreds of winter collected southern Californian fox sparrows examined. There has been very little bird collecting done in the mountains of San Diego County in winter, not over a dozen *Passerellas* from this whole county having been examined by the present writer, and it may be that future work will disclose the winter home of *fulva* to lie in this unexplored part of the state.

There is a skin in the collection of A. B. Howell (no. 6827), taken at Bluff Lake, San Bernardino Mountains, October 11, 1918, and one in the collection of W. L. Dawson, taken in Santa Barbara County, January 11, 1913, that also appear to be *fulva*, though not so unequivocally so as the Volcan Mountains specimen. The Bluff Lake specimen has the brown coloration of *fulva*, but not the attenuated bill characteristic of adults of this subspecies. The relatively stubby bill of this bird may be a result of immaturity, or it may, on the other hand, be an indication of intergradation, perhaps towards *megarhynchus*. Size and shape of bill are about intermediate between

the two subspecies. The Santa Barbara specimen is close to typical *fulva*. Two specimens in the W. M. Pierce collection (nos. 1772, 1796), from Cucamonga and San Dimas cañons, southern California, I have also considered as *fulva*, but they are far from typical of the form. If these several points in San Bernardino and Los Angeles counties represent northern and western limits of the winter habitat of *fulva*, as seems possible, it would not be surprising to find at these outposts non-typical birds, visitors from the borderland of the summer home of the race.

Passerella iliaca megarhynchus Baird

Thick-billed Fox Sparrow

Original description.—*P[asserella]. megarhynchus* Baird, 1858, p. 925. [Note that I use this name, *megarhynchus*, as it is written by the original describer, Baird. He, too, used it in this form in conjunction with the generic term *Passerella*.]

Type specimen.—No. 12402, U. S. Nat. Mus.; female; Fort Tejon, Kern County, California; collected by J. Xantus de Vesey; original number 1397; date of capture not on label.

Range.—Common winter visitant to the Pacific slope of southern California. Summer home unknown.

Specimens examined.—104 (see list, pp. 202–204).

Distinguishing characters.—Of the Schistacea group (see p. 89). From all other subspecies of this group except *brevicauda*, *megarhynchus* may be distinguished by its heavy, stubby bill and relatively brownish coloration. In both these features it approaches *brevicauda*, but it has a less heavy bill, and it is not as brown colored as in the extreme of that form. In bill structure *megarhynchus* is about intermediate between the type of *brevicauda* on the one hand and *fulva*, of southern Oregon, on the other (see fig. Y).

Remarks.—In assorting the confused series of “thick-billed sparrows” contained in the several collections available from southern California, there proved to be in each lot a rather large percentage of birds, winter visitants only, with the prominent characteristics of broad, stubby bill, and relatively brownish coloration. Through the courtesy of the authorities of the United States National Museum I have been permitted to examine the type specimen of *Passerella megarhynchus* Baird, and it proves to be a bird of this character. The name *megarhynchus* is thus shown to be properly applied (as it has been in the past) to the most common form of “thick-billed sparrow” found in winter in southern California, but it can no longer

be used for the breeding bird of the Sierra Nevada. Series of summer specimens from various parts of those mountains are available for comparison, and prove to be of a different type of bird (see page 173). It is not possible at present to indicate the breeding range of *megarhynchus*, but the relatively thorough working-out of the summer homes of *stephensi*, *mariposae*, *monoensis*, *fulva*, and *brevicauda*, made possible by the series of specimens here assembled, narrows down the territory in which this breeding area may be expected to be found. *Megarhynchus* as here restricted, is, it may be remarked, perfectly distinct from any of the above mentioned subspecies, and our ignorance of its summer habitat is not to be explained by a mistaking of seasonal or other variation of individual birds for the subspecific variation of geographic races. Although there are only winter specimens of *megarhynchus* at hand, there is sufficient material representative of the other closely related subspecies to demonstrate the reality of the indicated differences, regardless of season.

Megarhynchus is most nearly like *brevicauda*, in fact the material at hand indicates perfect intergradation between the two. Both are brownish colored birds, compared with *mariposae*, *monoensis*, and *stephensi*, and both have the same shaped bill, in different sizes. Series of breeding birds at hand show that the subspecies of the Sierras are decidedly grayish. *Stephensi*, *mariposae*, and *monoensis*, extending from the San Jacinto Mountains to Mount Shasta, are all of this pale type, and all have similarly shaped, rather slenderly-pointed, bills. Obviously there is no room here for the insertion of a brownish-colored, stubby-billed subspecies; also there are enough breeding stations represented along these mountain chains to show that there are no fox sparrows there of the *megarhynchus* type.

On the other hand, the available material shows the existence of a chain of brownish-colored subspecies of the Schistacea group, extending from *schistacea* of northern Nevada, through *fulva* of southern Oregon, and the Warner Mountains, California, and ending with *brevicauda* of the Yolla Bolly Mountains. In its salient characters *megarhynchus* apparently fits in between *fulva* and *brevicauda*; it is intermediate between the two, though appreciably nearer the latter. According to this reasoning the breeding grounds of *megarhynchus* would lie in the coastal mountains of extreme northwestern California, and, probably, southwestern Oregon. This section is not represented by a single specimen in the material at hand, and apparently there has been little or no bird collecting done there. As far as I know

there are no published references to the occurrence of fox sparrows in that region, at any rate nothing to shed light on this problem.

Among the winter birds from southern California here ascribed to *megarhynchus*, there are many that are difficult to distinguish by color from *mariposae*. It is worth noting that rather grayish-colored individuals are frequent in the Claremont series, while brown-colored ones predominate about Pasadena and Los Angeles. The gray-colored Claremont specimens, however, have the stubby bill characteristic of *megarhynchus*, and I consequently place them in that category. I do not claim to possess a perfect understanding of the exact relationships existing between *megarhynchus*, *mariposae*, and *fulva*, which, indeed, can not be attained without much more information than I possess regarding the summer habitats of all three; I can not do more than point out the features of the winter birds examined, as correlated with places of capture. The suggestion may be made, however, that here again is evidence of fairly close restriction of winter habitat; furthermore, winter birds with the various characters above described should in the future be checked up with summer birds from points as yet unrepresented, in the more minute working out of relationships and routes of migration.

Megarhynchus is a common winter visitant to the Pacific slope of southern California, but there are very few specimens from other points indicating the route traversed between this region and its breeding ground. There are three specimens at hand from Tower House, Shasta County, taken on March 2 and 7, and one from Sisson, Siskiyou County, September 5; whether these birds were winter visitants at the points of capture, or merely migrants, there is no way of telling. At any rate they may be taken as evidence that the breeding ground of *megarhynchus* lies at least as far north as this. The subspecies certainly does not breed in the immediate vicinity of either Tower House or Sisson.

One bird from Lakeport, Lake County, taken on February 27 (no. 11436; Calif. Acad. Sci.), is in large part albino, but is unequivocally *megarhynchus* nevertheless. There is one specimen of *megarhynchus* from Nicasio, Marin County, taken January 30, the only one of this subspecies that has come to light among the many fox sparrows examined from this county. The dates of capture of the two birds last mentioned are indicative of their being winter visitants, though the subspecies is evidently extremely rare at the points where they were taken. There is a record of *megarhynchus*

as seen at Alton Junction (near Eureka), Humboldt County, in late October (Ferry, 1908, p. 43), but in the absence of specimens there is no certainty as to the subspecies actually encountered.

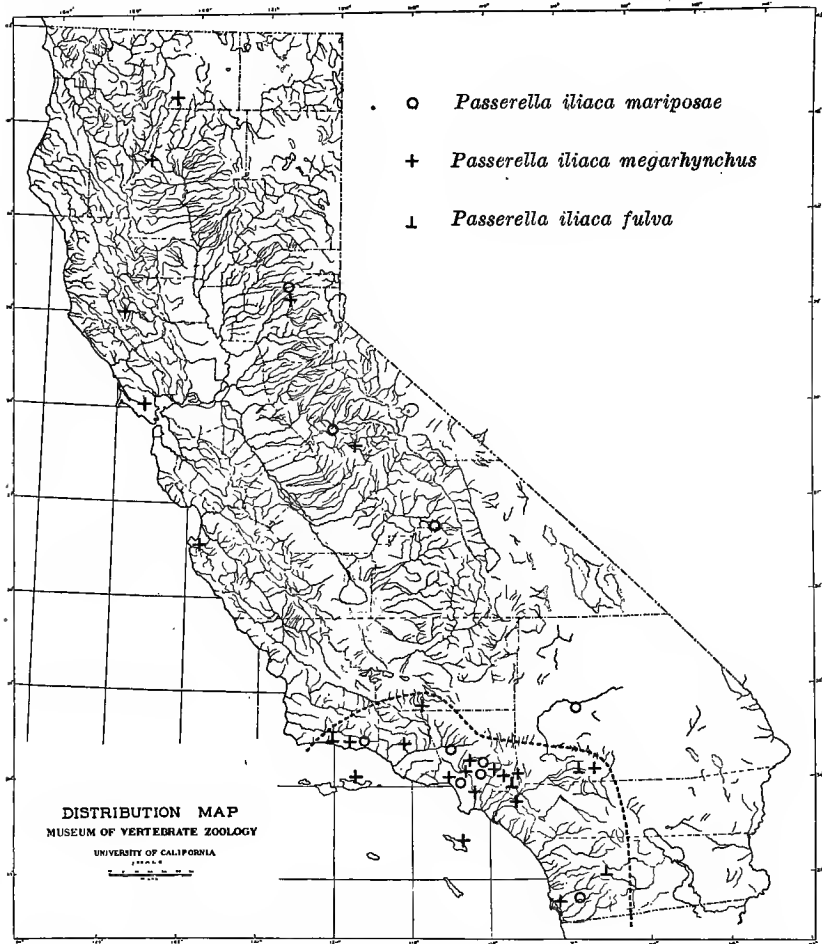


Fig. Z. Map showing winter occurrence of *Passerella iliaca mariposae*, *P. i. megarhynchus*, and *P. i. fulva* in California, as established by specimens examined by the author. The region enclosed within the dotted outline is believed to be the main winter habitat of *megarhynchus*. The locality stations of *mariposae* and *fulva* denote the capture of but a single specimen at each point, apparently stragglers from the still unknown center of winter abundance.

Along the line of the Sierra Nevada, among the scores of fox sparrows collected, there are but two examples of *megarhynchus*. One is from Blue Cañon, Placer County, taken on October 19, the other from El Portal, Mariposa County, on November 28. The subspecies is evidently rare in these mountains, but may be assumed

to winter in small numbers as far north as the latter station. The Pacific slope of southern California is evidently the winter metropolis of *megarhynchus*. In the foothills of this section it is in winter perhaps the commonest of the fox sparrows, certainly the most abundant of the Schistacea group. Dates of capture, in the region about Pasadena, range from September 15 to April 17; in the Santa Monica Mountains, from October 26 to February 22; from the Ojai Valley, Ventura County, there is one as late as April 27. There is but one specimen (no. 30446, Mus. Vert. Zool., Seaside, Monterey County, December 30) from a coastal point between Santa Barbara and San Francisco, but it would not be surprising should the subspecies be found regularly, migrating at least, along the coast ranges of this section.

On the whole there is a notable contrast in the abundance of this subspecies in its winter home in southern California, and its scarcity as a migrant farther north in the state. An explanation of this condition may be found in this bird again being one that leaves its breeding ground abruptly and departs by a long flight to its winter home, passing over much of the intervening country.

Passerella iliaca brevicauda Mailliard

Yolla Bolly Fox Sparrow

Original description.—*Passerella iliaca brevicauda* Mailliard, 1918, p. 138.

Type specimen.—No. 23924, Calif. Mus. Vert. Zool.; female adult; one-half mile south of South Yolla Bolly Mountain, in Trinity County, California; August 7, 1913; collected by A. C. Shelton and George Stone (original number 385).

Range.—There are breeding birds at hand from South Yolla Bolly Mountain, which lies at the junction of Trinity, Tehama and Mendocino counties, from Snow Mountain, in the northwestern corner of Colusa County, and also one juvenal from Mount Sanhedrin, in northeastern Mendocino County. Winter birds have been examined from the near vicinity of the coast, from Marin County, central California, and from Santa Barbara, Ventura and Los Angeles counties, including Santa Catalina Island, southern California.

Specimens examined.—73 (see list, pp. 204–205).

Distinguishing characters.—Of the Schistacea group (see p. 89). Of the subspecies within this group *brevicauda* is superficially most nearly like *stephensi*, the two being noticeably alike in the enormous development of the bill. Between *stephensi* and *brevicauda* there are differences of color and proportions. *Brevicauda* is brownish colored, *stephensi* grayish; *brevicauda* has the tail shorter than *stephensi* (see table 4), has weaker claws (see fig. AA), and a somewhat differently shaped bill (see fig. F).

Remarks.—Although *brevicauda* is one of the more recently differentiated local races of the species, it so happens that there is more information at hand regarding the seasonal distribution of this subspecies than there is regarding that of any of its near relatives. The available data include facts of decided interest, the locally restricted winter habitat being especially worthy of emphasis. In its summer home *brevicauda* occupies the westernmost point of any of the *schistacea* group, and in its winter home also it keeps just as far to the westward as possible. Other closely related subspecies occur quite as far west, it is true, but *brevicauda* in winter does not extend eastward (inland) for any distance, as do the others. It hugs the near vicinity of the coast. The local restriction of the race in Marin



Fig. AA. Feet of two subspecies of fox sparrow, natural size.

a. *Passerella iliaca stephensi*, adult female; no. 2096, Mus. Vert. Zool.; San Jacinto Mountains, California; July 10, 1908.

b. *Passerella iliaca brevicoda*, adult male; no. 23922, Mus. Vert. Zool.; South Yolla Bolly Mountain, Tehama County, California; August 1, 1913.

County, just north of San Francisco Bay, has been commented upon by Mailliard (1912, p. 63). Here it occurs in winter apparently with fair regularity upon certain rocky, brush-covered ridges near the coast, and nowhere else. East of San Francisco Bay, on the University of California campus, this subspecies has not yet been detected among the several kinds of fox sparrows that frequent these grounds in winter. Neither is it included in the extensive series of *Passerella* collected over a period of years at Hayward, a few miles to the southward, by W. Otto Emerson.

South of San Francisco Bay there are no record stations for this subspecies until Santa Barbara is reached, though it can hardly be doubted that it occurs in winter at suitable spots. In this region, as elsewhere, it is probably restricted to certain limited areas. In Los Angeles County the peculiarly local distribution of the race receives special emphasis from the large number of specimens of *Passerella* available from many points within the county, rendering it out of all question that the predominance of certain subspecies at certain spots

should be purely a coincidence (see pp. 110-111). Some of the writer's earliest experiences in bird collecting (in the vicinity of Los Angeles) were with fox sparrows, and he soon discovered that the place to hunt for "thick-billed sparrows" (quite satisfactorily thick-billed they were, too!) was in certain brushy cañons between Los Angeles and the ocean, while for "Townsend's sparrows" (any of the *Unalascensis* group) it was usually necessary to make trips to the mountain tops and cañons to the eastward above Pasadena.

In its history thus far, *brevicauda* has been regularly confused with *stephensi*. Winter specimens of the former at one time were cited by Mailliard (1912, p. 63) as demonstrating the winter occurrence of the latter in Marin County. Oberholser (1900, p. 233) lists specimens of *stephensi* from Santa Catalina Island in April, and Bowles (1911, p. 175) from Santa Barbara in August. The specimens upon which the above records were based have all been examined by the present writer, and all prove to be examples of *brevicauda*. It will be noted that Oberholser (*loc. cit.*) comments upon the brown dorsal coloration of the Santa Catalina Island specimens, one of the distinguishing features of *brevicauda* as compared with *stephensi*.

While *brevicauda* has thus been confused with *stephensi* wherever the former has been collected, I nevertheless do not believe the relationships of the two to be especially close. The large bill, common to both, is, of course, a most conspicuous feature, the presence of which would be apt to lead the observer astray, for without strongly confirmatory evidence one would hardly assume the existence of two subspecies of the same species, each characterized by exceptional development of the bill. With this feature conspicuously in view, the differentiating characters of color and proportions are not such as to impress the observer so strongly, especially with but a limited number of specimens for comparison. With an adequate series, however, it can be seen that the peculiar characters of *brevicauda* are further accentuations of the features, not of *stephensi*, but of *megarhynchus*. The latter is a rather brownish colored bird, compared with *mariposae* and *stephensi*, and with a broad, stubby bill. *Brevicauda* is still browner in color, and with the same shaped bill greatly enlarged (see fig. F). In typical *stephensi*, at least in adult birds, the bill is rather longer and more slenderly pointed, very much the shape seen in *mariposae*, though, of course, of greater size (see fig. E).

Individual variation in subspecific characters is manifested in the series of *brevicauda* to about the same extent as in the other races

of *Passerella*. Such variation in most cases takes the form of intergradation toward *megarhynchus*, sometimes in slight degree, occasionally to an extent that makes the placing of the individual specimen a matter of arbitrary decision. It is noteworthy that the birds from Snow Mountain, the southernmost known breeding station of *brevicauda*, have the bill perceptibly larger than in the Yolla Bolly birds, to the northward. The latter thus appear to show in some degree intermediateness toward *megarhynchus*. In but a few cases, among winter birds, is there any occasion for confusion with *stephensi*. In faded and worn plumage there may sometimes be difficulty in deciding between these two subspecies, but there are no fresh-plumaged birds at hand that are at all equivocal.

In addition to the normal variation just described, there is one specimen at hand (coll. W. L. Dawson, male, "Santa Barbara Co., Cal.," November 22, 1913) that shows a noteworthy trace of albinism. It has a pure white area on the forehead, extending from eye to eye, from the base of the bill backward to a maximum width of six millimeters. On the left side it includes the lores and extends below the eye over the cheek. This white marking is of interest through its appearance of being an unusual extension of the two whitish spots between eyes and nostrils, present to a greater or less extent in practically all fox sparrows.

The series of breeding birds at hand sheds little light upon the dates of arrival and departure of this subspecies upon its nesting ground, for they are all midsummer specimens. The winter birds from Marin County were taken on dates ranging from September 23 to April 29. Specimens collected by Mailliard on September 23 were believed by him to have been raised possibly at the spot where they were taken (Mailliard, 1912, p. 63), a supposition that has not as yet been verified. One specimen at hand from Nicasio, Marin County (Carnegie Museum, no. 29698), bears the date of "June" 28. The label now attached to this skin is obviously not that of the original collector. In all probability a mistake was made in copying, so that this skin can not be admitted as evidence of the breeding of *brevicauda* at this place.

From southern California by far the earliest fall migrant is Bowles' specimen from Little Pine Mountain, Santa Barbara County, taken August 30. From the Santa Monica Mountains there are specimens from October 4 to January 19, but there is little doubt that the birds arrive earlier and depart later than is indicated by these dates.

There is one skin at hand from the Ojai Valley, Ventura County, April 18. From Santa Catalina Island a specimen collected April 19 affords the latest date for southern California. Specimens collected on the same island in mid-December attest the wintering of the bird there.

***Passerella iliaca canescens* Swarth**

White Mountains Fox Sparrow

Original description.—*Passerella iliaca canescens* Swarth, 1918, p. 163.

Type specimen.—No. 28439, Calif. Mus. Vert. Zool.; immature male (in nearly complete first winter plumage); Wyman Creek at 8250 feet altitude, east slope of White Mountains, Inyo County, California; August 15, 1917; collected by A. C. Shelton; original number 3549.

Range.—In summer apparently confined to the White Mountains, in Inyo and Mono counties, California. Migration route and winter habitat unknown, save as the species is represented by a few specimens from Los Angeles and Santa Barbara counties and the Colorado River, California.

Specimens examined.—23 (see list, p. 205).

Distinguishing characters.—Of the *Schistacea* group (see p. 89). Distinguished from all other subspecies within this group, save *schistacea*, by its diminutive bill (see fig. D). From *schistacea*, *canescens* may be differentiated by its decidedly more grayish coloration. This is strikingly apparent when freshly molted birds of the two subspecies are compared, and it is also evident in the juvenal plumage. In worn midsummer birds these color differences naturally are obscured.

Remarks.—The type series of *canescens* consists of twelve specimens from the Boreal Zone on the White Mountains, in Inyo and Mono counties, California. The series includes three adults in rather worn summer plumage, two adults undergoing the annual molt, but mostly in the new winter plumage, and six in juvenal plumage, some of them showing a few feathers of the first winter plumage. There are a few winter birds at hand from southern California that appear to belong to this subspecies, all taken at points some distance from the coast. One from Mount Wilson, November 4, 1894 (no. 34, Swarth coll.), appears to be typical *canescens*, extremely small-billed, of decidedly slaty coloration, and the breast spotting rather sparse and with no trace of the reddish brown peculiar to *schistacea*. Others from Blythe, Riverside County (on the Colorado River), San Antonio Cañon, San Bernardino County, San Dimas and Palmer's cañons, Los Angeles County, and Santa Barbara, though not so extreme in character, are apparently also to be referred to *canescens*. There is a notable difference between these birds and the brownish colored *schistacea* found migrating in the Sierra Nevada.

The southern California winter specimens do not suffice to indicate the winter habitat of this subspecies. Apparently, however, *canescens*, like the other Sierran and Great Basin forms, avoids the vicinity of the coast, and must be looked for farther inland. The points of winter capture here recorded may indicate the northern and western limits at that season.

It is a noteworthy fact that in all the bird collecting carried on by the Museum of Vertebrate Zoology in Owens Valley and in the Death Valley region, not a single migrating example of *canescens* was secured. As these places are directly south of the White Mountains, they would certainly be traversed by migrating *canescens*, unless—as seems probable—the birds pass over these regions in long, direct flights toward and from the winter habitat. Accumulating data points more and more convincingly toward this latter mode of travel as prevalent among many of the subspecies of *Passerella*.

Passerella iliaca monoensis Grinnell and Storer

Mono Fox Sparrow

Original description.—*Passerella iliaca monoensis* Grinnell and Storer, 1917, p. 165.

Type specimen.—No. 26930, Calif. Mus. Vert. Zool.; male adult; Mono Lake Post Office, altitude 6500 feet, Mono County, California; May 21, 1916; collected by Joseph Dixon; original no. 4644.

Range.—Breeds on the east slope of the Sierra Nevada in the vicinity of Mono Lake; possibly also in the Panamint Mountains. Occurs in winter in the western foothills of the Sierra Nevada and on the Pacific slope of southern California.

Specimens examined.—38 (see list, p. 206).

Distinguishing characters.—Of the Schistacea group (see p. 89). A gray-colored fox sparrow, in bill character intermediate between *canescens* and *mariposae* (see fig. E). Of the pale coloration common to the *canescens-monoensis-mariposae-stephensi* series. In this line of subspecies *monoensis* occupies a position comparable to that of *fulva* in the *schistacea-fulva-megarhynchus-brevicauda* chain. Specimens of *monoensis* and *fulva* are sometimes very much alike in bill structure, but may be distinguished by coloration, *fulva* being a brownish colored bird, *monoensis* a grayish colored one.

Remarks.—There is a fox sparrow at hand, an adult male in rather worn plumage, collected at Jackass Springs, Panamint Mountains, California, June 25, 1917 (no. 28430, Mus. Vert. Zool.) that I tentatively refer to *monoensis*. The capture of this specimen in midsummer, a bird which was in full song and in breeding condition, is fair

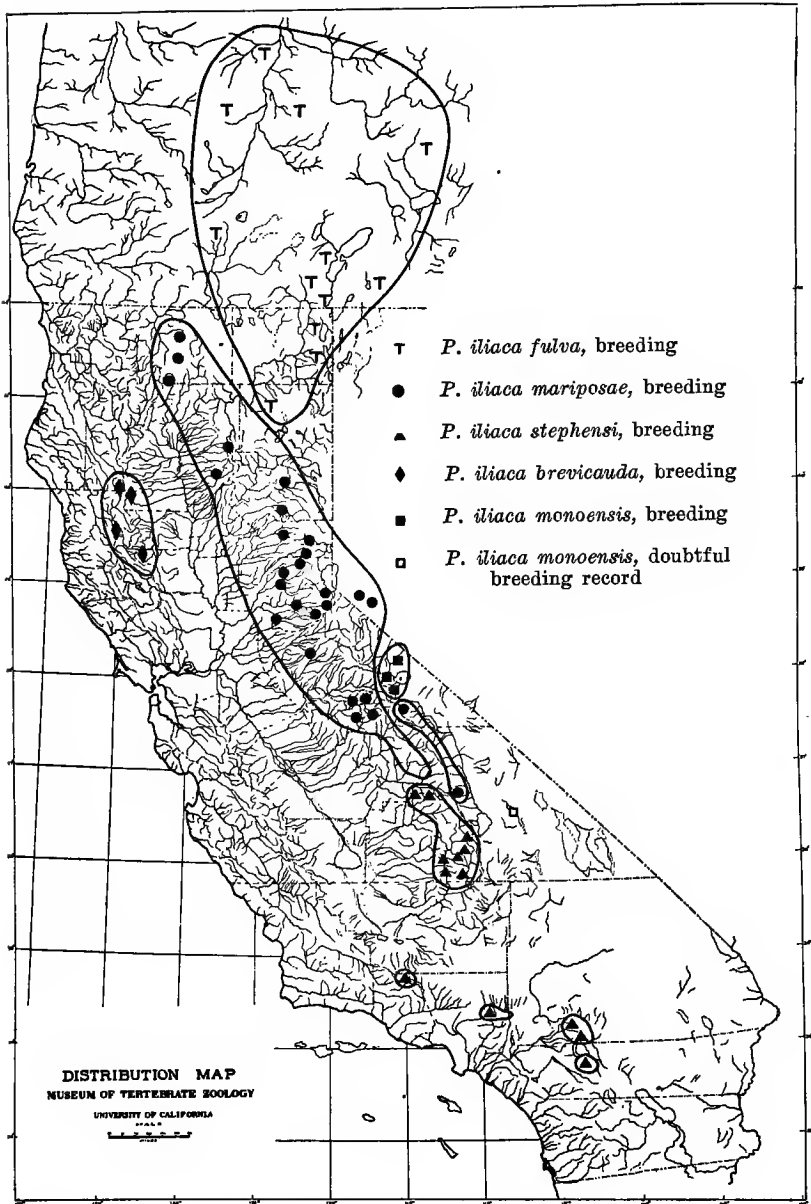


Fig. BB. Map showing summer habitat of *Passerella iliaca fulva*, *P. i. mariposae*, *P. i. monoensis*, *P. i. stephensi*, and *P. i. brevicauda*. The symbols indicate the location of breeding stations, as established by specimens examined by the author.

evidence that the species was nesting in the mountains where it was taken, though no more of the birds were seen. If I am correct in ascribing this specimen to *monoensis*, it may indicate that the subspecies occupies a rather extensive summer habitat on the summits of certain of the desert mountains. However this may be, the only breeding specimens at hand that appear to be unequivocally of the race *monoensis* (aside from the one exception above noted) are all from a relatively limited region about Mono Lake. Specimens from Mammoth, immediately to the southward, appear to be *mariposae*, as are the birds still farther south on the east slope of the Sierras (see p. 175). Furthermore, between Mono Lake and the Panamint Mountains lie the White Mountains with the very different subspecies *canescens*. It is hardly reasonable to suppose that the latter race would be thus interposed between the known habitat of *monoensis* at Mono Lake, and an outlying colony such as seems to be indicated by the Panamint Mountains specimen. Altogether, the capture of the latter is an extremely puzzling occurrence.

While engaged in this study of *Passerella*, I took occasion to request Mr. Donald D. McLean to collect for the Museum specimens of fox sparrows from the vicinity of his home, near Coulterville, Mariposa County, California. There were but few of any of the subspecies at hand from the Sierra Nevada foothills, and he had told me that there were many "thick-billed sparrows" in that region during the winter months. To my surprise, of the nine birds of this type that he sent in, collected during December and January, eight proved to be *monoensis*. Coulterville is at the west base of the Sierra Nevada, almost due west of Mono Lake, though, of course, with the whole width of the mountain chain between the two points. There is a specimen of *monoensis* at hand taken in Yosemite Park, October 1, and four others from Horse Corral Meadow, in the mountains of Fresno County, secured between September 19 and 23, indicating that the subspecies spills over the crest of the Sierras on to the western slope in the migration from the summer home. If the main winter habitat should prove to be in the western foothills of the Sierra Nevada as is indicated by the Coulterville birds, it would imply a rather remarkable migration route—almost due east and west, rather than north and south.

There are a few scattered winter birds at hand from points in Los Angeles County, including Santa Catalina and San Clemente islands, all taken west of the desert divides. Extreme dates of capture

are September 24 (San Antonio Cañon) and March 28 (San Clemente Island); other specimens have been taken during October, December, January, and February.

Passerella iliaca mariposae Swarth

Yosemite Fox Sparrow

Original description.—*Passerella iliaca mariposae* Swarth, 1918, p. 161.

Type specimen.—No. 25693, Calif. Mus. Vert. Zool.; adult male; ridge at 7000 feet; near Chinquapin, Yosemite Park, California; June 10, 1915; collected by J. Grinnell; original number 3284.

Range.—Summer visitant to the Canadian and high Transition zones in the northern and central Sierra Nevada. Breeding stations represented by specimens in hand range from central Siskiyou County (head of Little Shasta River) at the north, south at least to the Yosemite region on the west slope of the Sierras, to Kearsarge Pass on the east slope. There are a few winter specimens at hand from scattered points in San Diego, Los Angeles and San Bernardino counties, but too few to indicate accurately the entire winter habitat or migration routes.

Specimens examined.—206 (see list, pp. 206–209).

Distinguishing characters.—Of the Schistacea group (see p. 89). With the gray coloration common to the *canescens-monoensis-mariposae-stephensi* series, and not to be distinguished in color and markings from the other members of this chain of subspecies. In bill structure *mariposae* lies between *monoensis* and *stephensi* (see fig. E). In general size and length of tail in this line there is progressive increase from *canescens* to *stephensi*, and in these particulars as in size of bill, *mariposae* occupies its appropriate intermediate position (see table 4).

Remarks.—While there is at hand an abundance of summer specimens of *mariposae*, there is a notable dearth of winter collected birds. These facts, coupled with the reverse condition in *megarhynchus*, of which I have seen winter specimens only, may be used by some as arguments proving the two to be identical, and only suffered to masquerade under different names through a misunderstanding of seasonal differences. In contravention to this idea it may be pointed out that there are many specimens in the available series of *mariposae* taken at summer stations just prior to the birds' departure therefrom in the fall, and after they had assumed the winter plumage, these specimens sufficing to show the color differences distinguishing *mariposae* from *megarhynchus*. Shape of bill is an excellent differentiating character between adults at any season.

There are a few examples of *mariposae* at hand taken in winter at various points in southern California, but they are so few in

number compared with the abundance of certain other subspecies associated with them that there seems no doubt that the places of capture of these scattered individuals do not represent the main winter home of the race. Then, too, some of these winter birds are not absolutely typical of *mariposae*, though most nearly resembling that form. Altogether, it is evident that the winter metropolis of *mariposae* is still to be discovered. In this connection it may be pointed out that we are similarly ignorant of the winter homes of the other Sierran fox sparrows, *stephensi* and *monoensis*, and of their neighboring relatives *fulva* and *canescens*. In each case there are scattering winter birds and migrants at hand, but nothing to show where the bulk of the populations winter. It is not to be supposed that all five of these subspecies necessarily depart to the same place, but it seems possible that their modes of departure and arrival are very similar, and that the explanation of the puzzle in each case lies in the existence of a relatively restricted winter habitat, and one that has not been thoroughly scrutinized for these birds at that season. It may be, of course, that *mariposae* winters in some parts of the Sierran foothills, but there is little evidence of this either in the available specimens, or in published literature. Belding (1890, p. 170), speaking of the Sierran bird (under the name *megarhynchus*), says: "Not at Alta and Colfax November 17-21, nor at Red Bluff in warm winter of 1884-85. I never see it in the lower foothills of Calaveras County in winter, though *P. unalaschcensis* is common there at that time."

That the detailed mapping of summer ranges of the forms of *Passerella* breeding in the Sierra Nevada will yield interesting and valuable results is indicated by the general facts already gathered. The habitats of *stephensi* and *mariposae* are each known to be interrupted along certain lines where thorough exploration has been prosecuted, and as there are other parts of the Sierras presenting similar conditions it is evident that at these places also there must be breaks in distribution, and that each of these subspecies in summer is scattered into a number of colonies of varying extent.

The Kings River Cañon section of the Sierra Nevada may be cited in its bearing on the fox sparrow problem. This cañon runs far back into the mountains, a broad, gently sloping valley, Transition zone clear to its uppermost confines and therefore not inhabited in summer by *Passerella*. The surrounding walls are high and steep, and drop from plateaus, zonally of high Transition, Canadian and higher. In

this elevated region south of the Kings River Cañon the present writer found *stephensi* in abundance in the late summer, evidently on its breeding ground. This is assumed to be the northernmost point reached by this subspecies in the Sierra Nevada, though no collecting has as yet been done on the high country immediately north of the Kings River Cañon. This gorge evidently acts as a barrier to the continuous distribution of *Passerella* in this direction. From the head of the Cañon (Transition Zone) steep slopes arise, carrying an extremely limited belt of Canadian Zone (where we saw no *Passerella*) and leading abruptly to the extensive strip of Hudsonian and Alpine-Arctic along the crest of the Sierras. These latter belts are not occupied by *Passerella*, hence they act as a barrier between colonies on the east and west slopes of the mountains.

On the east side, in Kearsarge Pass, *mariposae* is abundant in summer, the southernmost point at which the subspecies has been found breeding. This station on the east side of the mountains is directly opposite that point on the west side where *stephensi* occurs at its northern limit, the two being separated by the intervening strip of Alpine-Arctic and Hudsonian. Thus *mariposae* occurs considerably farther south on the east slope of the Sierra Nevada than on the west slope. There are one or two specimens of *Passerella* at hand from Mammoth, Mono County, on the east slope and close to the habitat of *monoensis*. These appear to be referable to *mariposae*, and indicate the probable extent of territory occupied by this subspecies on the east slope of the Sierras, a territory cut off from the western colony for its entire length by the Alpine-Arctic and Hudsonian zone of the summit. It is difficult to understand why this isolated division should not be of the *monoensis* type. There is no obvious barrier between it and that subspecies, and reasoning *à priori* one would expect the features of the latter race to be developed over this entire eastern exposure where *Passerella* occurs. Such is most emphatically not the case at the southern limits of *mariposae*, however, Kearsarge Pass specimens being unmistakably similar to *mariposae* of the Yosemite region, and impossible to confuse with their nearer neighbors, *stephensi* on the one hand and *monoensis* on the other.

Farther north, in Eldorado County, there is what appears to be intergradation toward *monoensis*. Birds from the western part of this county are typical *mariposae*, but in the series from the immediate vicinity of Lake Tahoe and Mt. Tallac there are some individuals quite as small-billed as selected examples of *monoensis*. So, too, as regards

three skins from Douglas County, Nevada, southeast of Lake Tahoe. Two of these are about as small-billed as *monoensis*, while the third is an average *mariposae*.

Monoensis is not a strongly marked form, and its characters, such as they are, obviously show intermediateness between *mariposae* and *canescens*, between which races *monoensis* is situated geographically. This fact may have some bearing on the relative restriction of the region in which typical *monoensis* occurs. Doubtless also, a careful working out in greater detail than has yet been done of the breeding ranges of the several subspecies concerned will go far toward explaining facts the meaning of which now seems obscure.

There is little data at hand to indicate precise dates of arrival and departure of the subspecies *mariposae* at the summer and winter homes. In Kearsarge Pass, on May 27, male fox sparrows were in full song, evidently settled at their nesting grounds, and on May 29 a set of three well incubated eggs was taken. There is a female *mariposae* at hand (no. 29090, Mus. Vert. Zool.), which had laid part of its set, taken May 15 at the head of Little Shasta River, Siskiyou County, the northernmost point of record for the subspecies. Of fall dates in the Sierra Nevada, there is a large series of *mariposae* at hand taken at Cisco and Blue Cañon, Placer County, from August to October, the latest from Blue Cañon, October 14. There is one bird from Tuolumne River, Yosemite Park, October 1. There is one specimen at hand taken at Yermo, on the Mohave Desert, May 28. In view of the above nesting dates this last must be regarded as an extremely belated migrant. This bird is a typical example of *mariposae*; the point of capture, of course, is many miles from the nearest point in this subspecies' summer habitat. Two specimens from Mt. Wilson, Los Angeles County, taken April 1 and 4, respectively, may indicate more nearly the usual limit of its stay in the spring in the south.

Passerella iliaca stephensi Anthony

Stephens Fox Sparrow

Original description.—*Passerella iliaca stephensi* Anthony, 1895, p. 348.

Type specimen.—No. 15387, Carnegie Institute Museum; male adult; San Jacinto Mountains, California, at 8000 feet; July 14, 1895 (see p. 181).

Range.—Summer visitant to upper Transition and Canadian zones in the southern Sierra Nevada and the Sierras of southern California. There are several isolated tracts occupied by this subspecies, namely: in the Sierra Nevada, from Hume and Horse Corral Meadow, Fresno

County, south through Tulare County; on the summit of Mount Piños, Ventura County; in the San Gabriel Mountains, Los Angeles County; the San Bernardino Mountains, San Bernardino County; and the San Jacinto Mountains, Riverside County. The winter home is unknown.

Specimens examined.—186 (see list, pp. 209–211).

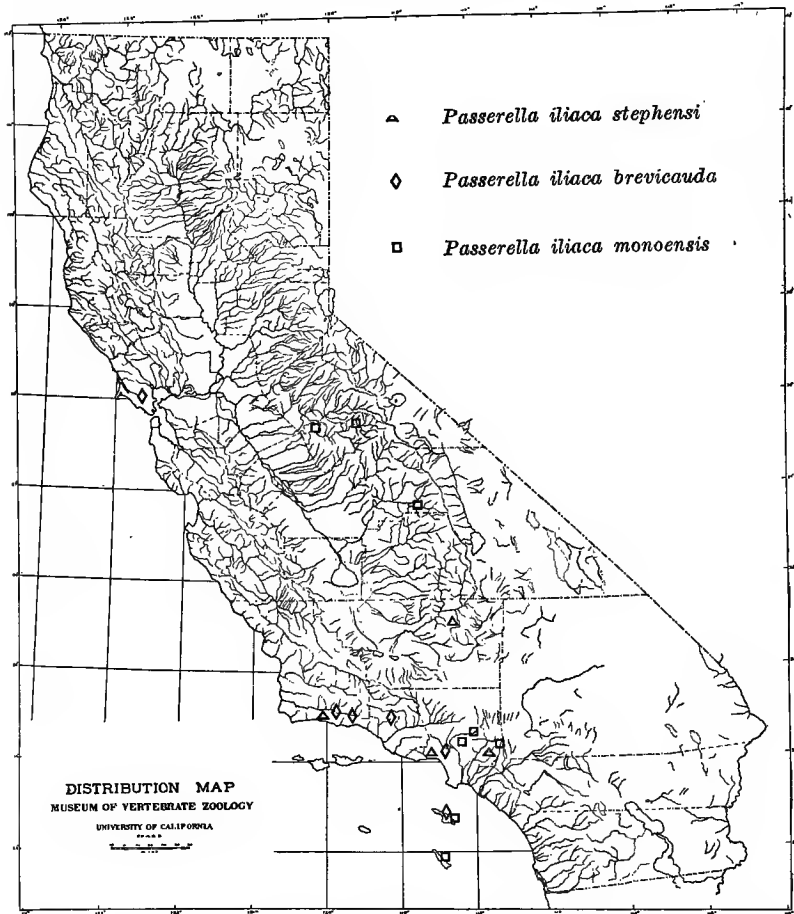


Fig. CC. Map showing winter occurrence of *Passerella iliaca stephensi*, *P. i. brevicauda*, and *P. i. monoensis* in California, as established by specimens examined by the author. Note the restriction of *brevicauda* to the near vicinity of the coast. The locality stations for *stephensi* denote the capture of but four specimens, apparently stragglers from the still unknown main winter habitat.

Distinguishing characters.—Of the Schistacea group (see p. 89). Most nearly like *mariposae*, from which it is distinguished by slightly greater general size and notably large bill (see fig. E). The enormous bill distinguishes *stephensi* from all other fox sparrows except *brevicauda*. From the latter it is distinguished by rather longer,

more slenderly pointed bill (compared with the blunt, stubby bill of *brevicauda*) (see fig. F'), by more grayish coloration, and by longer tail (see table 4).

Remarks.—In all its characters *stephensi* represents the culmination of the line of development beginning with *canescens* and continuing through *monoensis* and *mariposae*. Gray coloration is common to all these forms, as compared with the more brownish hue of the other subspecies of the Schistacea group, and there is no apparent difference in this respect between these several southern subspecies. There is, however, gradual increase in general size from *canescens* along the line indicated to *stephensi*, with notable increase in size of

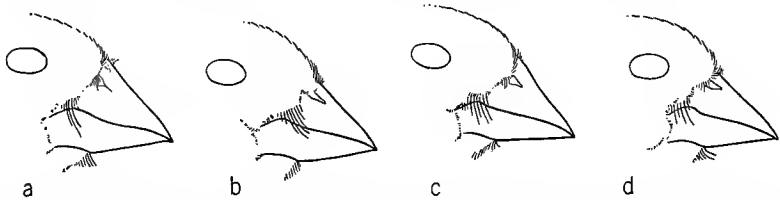


Fig. DD. Bills of two subspecies of the Schistacea group (races that are distinguished mainly by differences of size in this member), showing how variation of adult and immature may be mistaken for variation differentiating subspecies. *a* and *b* are, respectively, adult and undeveloped immature of *stephensi*, *c* and *d*, of *mariposae*; *b* is more nearly like *c* than like *a*.

a. *Passerella iliaca stephensi*, adult male; no. 20505, Mus. Vert. Zool.; Taylor Meadow, Sierra Nevada, Tulare County, California; July 19, 1911.

b. *Passerella iliaca stephensi*, immature male; no. 27388, Mus. Vert. Zool.; Hume, Fresno County, California; August 18, 1916.

c. *Passerella iliaca mariposae*, adult male; no. 25693, Mus. Vert. Zool.; Chinquapin, Yosemite National Park, California; June 10, 1915.

d. *Passerella iliaca mariposae*, immature male; no. 23195, Mus. Vert. Zool.; Blue Cañon, Placer County, California; August 28, 1912.

bill, and there is also, to a lesser extent, some increase in proportionate length of tail.

Stephensi has a strikingly disconnected range, occurring in a number of widely separated high mountain localities. In the southern Sierra Nevada the subspecies is found in high Transition and Canadian from southern Fresno County (at points just south of Kings River), south through Tulare County. The localities of occurrence are all on the west slope of the range. Fox sparrows at this latitude do not ascend into the Hudsonian and Alpine-Arctic zones, which constitute so large a part of the summit of the Sierra Nevada. This strip along the divide is an effective barrier to the general dispersal of these birds, and in the case of *stephensi* it has apparently restricted the subspecies to the western slope.

South of the Sierra Nevada the next breeding station of *stephensi* is a limited area on the summit of Mount Pinos, some eighty miles southwest of the southernmost station in the Sierras. Then, still farther south, there are widely disconnected areas on the San Gabriel Mountains, the San Bernardino Mountains, and the San Jacinto Mountains, separated from each other by many miles of lower zones. In the San Jacinto Mountains points of occurrence are mostly from 8000 to 9000 feet, though a few birds were seen in one part of the mountains as low as 6000 feet. In the San Bernardino Mountains the subspecies occurs at about the same elevation, mostly from 7400 to 9000 feet; in the San Gabriel Mountains it is known only from the higher slopes of Mount Waterman from 7000 feet upward to the summit (7752 feet altitude); and on Mount Pinos (altitude 8826 feet) from 8000 feet upward. In the Sierra Nevada the vertical range is from 7000 to 10,000 feet.

It is a notable fact that, despite the isolation of these several colonies and the demonstrated plasticity of the species throughout its range, there are no discernible differences between specimens of *stephensi* from the several regions occupied. Considering the variation existing between the many closely connected subspecies, and the way in which each represents a step from one extreme to another, it might be expected that such widely parted groups as those into which *stephensi* is divided would illustrate separate and distinguishable stages as they advanced farther and farther from the starting point, but such is not the case. In the series at hand I am unable to appreciate any tangible features serving to distinguish birds even from the extremes of the subspecies' range. The most that can be said regarding such differences is that in the series from Hume, Fresno County (the northernmost point at which *stephensi* has been collected), there are certain small-billed individuals that may be taken to illustrate intergradation with the nearby form *mariposae*, but in the same series there are other specimens with quite as large bills as the maximum from any other place. In other words, while *stephensi* is the culmination of a series of steps from *canescens* and through *monoensis* and *mariposae*, the maximum of change is reached as soon as the habitat of the subspecies is entered at the north, where *mariposae* and *stephensi* come together. There is no further accentuation of character in the extensive but disconnected habitat of *stephensi* as it extends southward.

Stephens fox sparrow is a summer visitant only upon its breeding grounds, but there are neither specimens nor notes available indicating

dates of arrival in its summer home. All the breeding birds at hand were taken long after they had settled down to the duties of nesting. As regards the time of departure at the summer's end, this can be fairly definitely fixed. In the San Jacinto Mountains I revisited in September, 1914, certain sections where the Stephens sparrow had been found in abundance in the summer of 1908. On September 9 one was secured near Strawberry Valley, somewhat below the breeding level in this range. On September 11, after most careful search, four were seen in Tahquitz Valley, in the heart of the nesting ground, and on September 15, one other was noted, the last observed, though I remained in the region some days longer.

In the San Bernardino Mountains Stephens sparrows "were seen in small numbers at Bluff Lake as late as September 3" (Grinnell, 1908, p. 99). At Hume, Fresno County (altitude 5300 feet), Stephens sparrows were abundant during the middle of August, 1916, evidently on their nesting grounds from the number in juvenal plumage, and numerous specimens were collected from August 17 to 23. On September 25 and 26, this point was revisited, and while fox sparrows were again numerous they proved to be practically all examples of more northern subspecies on their southward migration. One *stephensi* was collected, on September 26.

The main winter home of the Stephens fox sparrow is unknown, and it seems evident that when the birds leave their summer habitat it is an abrupt departure, and possibly to a relatively great distance. They do not descend the mountains to the foothills and adjacent valleys, which are occupied in winter by other subspecies, or they would surely have been detected in such places. *Stephensi* has been reported in winter from Santa Catalina Island (Oberholser, 1900, p. 233), but the specimens upon which the statement was based prove to be of another subspecies, *brevicauda* (see p. 167).

In partial contradiction to my general statement regarding the winter habitat, I must admit to having before me four fox sparrows, taken in midwinter and to all appearances unequivocal examples of *stephensi*. The data for these skins are as follows: No. 8106, coll. F. S. Daggett, male, Franklin Cañon, Santa Monica Mountains, Los Angeles County, California, November 24, 1915; no. 1424, coll. J. E. Law, female, Hollywood, Los Angeles County, California, February 22, 1912; no. 1762, coll. W. M. Pierce, male, Palmer's Cañon, Los Angeles County, California, January 11, 1919; coll. A. Brooks, male, Santa Barbara, California, January 11, 1913. As far as they go these

birds must be conceded to be winter collected examples of *stephensi*, but it must be recalled that they are but four specimens out of several hundred fox sparrows collected in the same general region, and the conclusion seems unavoidable that they represent unusual occurrences of some sort. When the normal winter home of *stephensi* is discovered that place undoubtedly will be found to harbor the birds in numbers.

Through the courtesy of the authorities of the Carnegie Museum, I have been permitted to examine the type specimen of *stephensi*, collected by A. W. Anthony, and labelled as taken in the San Jacinto Mountains at 8000 feet altitude. This elevation in these mountains can mean, in this connection, but one place, Tahquitz Valley. In this valley the Stephens fox sparrow is an abundant summer visitant, while the opposite slope of San Jacinto Peak at that altitude is far too precipitous to afford suitable surroundings for the bird. Tahquitz Valley may thus be taken as the type locality of *stephensi*, fixing it a little more exactly than the general term San Jacinto Mountains.

TABLE 4.—Measurements in Millimeters (Average, Minimum and Maximum) of the Subspecies of *Passerella iliaca*

| Wing | Tail | Culmen | Depth of bill | Width of bill | Tarsus | Hind toe and claw | Middle toe and claw |
|------------------|------------------|------------------|---|---------------|------------------|-------------------|---------------------|
| 88.5 (86.0-90.0) | 71.7 (69.2-73.8) | 11.6 (11.2-11.8) | <i>Passerella iliaca iliaca</i> | | | | |
| | | | 4 males: Kowak and Yukon regions, Alaska | | | | |
| | | | 9.4 (9.5-10.0) | 8.2 (8.0-8.5) | 24.2 (23.2-25.0) | 18.2 (17.5-19.2) | 22.5 (21.5-24.5) |
| | | | <i>Passerella iliaca allingani</i> | | | | |
| | | | 7 males: Alberta and British Columbia | | | | |
| 81.2 (78.5-86.0) | 76.1 (69.0-80.5) | 10.6 (10.0-11.5) | 9.4 (8.8-9.8) | 7.9 (7.5-8.2) | 23.1 (22.0-24.2) | 19.1 (18.0-21.0) | 22.5 (20.8-25.5) |
| | | | <i>Passerella iliaca unalascensis</i> | | | | |
| | | | 1 male: Unalaska | | | | |
| 76.5 | 75.5 | 11.0 | 10.0 | 9.0 | 23.2 | 18.5 | ..... |
| | | | 8 males: Alaska Peninsula | | | | |
| 83.6 (81.0-85.0) | 76.2 (72.5-80.5) | 12.0 | 10.0 (9.5-10.5) | 8.7 (8.2-9.0) | 25.3 (25.0-26.0) | 20.3 (19.0-21.5) | 23.7 (22.2-25.0) |
| | | | <i>Passerella iliaca insularis</i> | | | | |
| | | | 10 males: Kodiak Id. | | | | |
| 81.9 (78.0-86.0) | 74.4 (71.0-78.5) | 12.3 (12.0-13.0) | 10.3 (9.5-11.0) | 8.9 (8.5-9.0) | 25.2 (24.0-27.0) | 20.5 (19.0-21.5) | 24.5 (24.0-26.0) |
| | | | <i>Passerella iliaca sinuosa</i> | | | | |
| | | | 10 males: Prince William Sound | | | | |
| 81.0 (78.0-83.8) | 73.1 (68.2-76.0) | 12.2 (11.2-13.0) | 9.9 (9.2-10.5) | 7.9 (7.5-8.2) | 24.4 (23.5-25.0) | 20.3 (19.0-21.5) | 23.3 (21.8-25.0) |
| | | | <i>Passerella iliaca annexens</i> | | | | |
| | | | 9 males: Yakutat | | | | |
| 81.3 (80.0-83.0) | 72.7 (67.0-75.5) | 11.8 (11.0-12.5) | 9.4 (9.0-10.0) | 8.1 (8.0-8.2) | 24.7 (23.5-25.0) | 19.8 (18.0-20.8) | 23.2 (22.0-24.5) |
| | | | <i>Passerella iliaca townsendi</i> | | | | |
| | | | 10 males: Admiralty and Baranof Ids. | | | | |
| 78.6 (74.5-80.5) | 71.4 (67.2-74.0) | 11.6 (10.8-12.2) | 9.1 (8.5-9.5) | 7.6 (7.2-8.0) | 25.0 (24.0-26.0) | 20.1 (18.0-20.8) | 23.4 (21.5-25.5) |
| | | | <i>Passerella iliaca fuliginosa</i> | | | | |
| | | | 4 males: Neah Bay, Wash., and Vancouver Id., B.C. | | | | |
| 82.0 (79.0-83.5) | 76.1 (74.5-78.2) | 11.9 (11.2-12.2) | 10.6 (10.0-11.0) | 8.0 | 26.0 (25.5-26.5) | 20.8 (20.0-21.5) | 24.1 (23.0-26.0) |
| | | | <i>Passerella iliaca schistacea</i> | | | | |
| | | | 4 males: Banff, Alberta | | | | |
| 80.1 (78.2-81.0) | 77.0 (76.0-78.0) | 10.9 (10.5-11.2) | 9.5 (8.8-10.0) | 8.1 (8.0-8.5) | 22.7 (22.0-23.5) | 18.3 (18.0-18.5) | 22.9 (22.0-24.0) |
| | | | 10 males: Pine Forest Mts., Nev. | | | | |
| 80.4 (78.0-85.0) | 80.6 (78.0-84.5) | 11.5 (11.0-11.8) | 9.5 (8.8-10.2) | 8.1 (8.0-8.5) | 23.4 (22.8-24.0) | 18.4 (17.5-19.5) | 21.7 (20.5-22.5) |

TABLE 4.—Measurements in Millimeters (Average, Minimum and Maximum) of the Subspecies of *Passerella iliaca*—(Concluded)

| Wing | Tail | Culmen | Depth of bill | Width of bill | Tarsus | Hind toe and claw | Middle toe and claw |
|---|------------------|------------------|------------------|------------------|-------------------|-------------------|---------------------|
| <i>Passerella iliaca fulva</i> | | | | | | | |
| 10 males: Modoc Co., Calif. | | | | | | | |
| 80.8 (79.0-85.0) | 82.2 (78.0-85.5) | 12.1 (11.0-13.8) | 11.1 (10.5-11.5) | 9.5 (9.0-10.0) | 23.4 (22.0-24.2) | 19.5 (18.0-21.2) | 22.9 (22.0-24.0) |
| <i>Passerella iliaca megarhynchus</i> | | | | | | | |
| 10 males (winter birds): southern California | | | | | | | |
| 82.2 (79.0-85.5) | 84.8 (80.5-90.0) | 12.0 (11.0-13.0) | 11.9 (11.0-14.0) | 10.4 (9.0-12.0) | 23.7 (23.0-25.0) | 19.8 (17.0-21.2) | 23.0 (21.2-24.0) |
| <i>Passerella iliaca brevicauda</i> | | | | | | | |
| 1 male: S. Yolla Bolly Mt., Calif. | | | | | | | |
| 80.0 | 78.0 | 13.5 | 13.8 | 12.0 | 24.0 | 17.2 | 22.0 |
| 6 males: Snow Mt., Calif. | | | | | | | |
| 83.4 (81.5-87.0) | 84.3 (79.0-90.0) | 13.3 (12.0-14.2) | 14.1 (13.5-15.5) | 11.8 (11.2-12.2) | 23.8 (22.5-25.0) | 19.1 (18.0-20.0) | 23.8 (23.0-24.0) |
| <i>Passerella iliaca canescens</i> | | | | | | | |
| 6 males: White Mts., Calif. | | | | | | | |
| 80.5 (77.0-84.2) | 81.1 (76.0-88.0) | 10.8 (10.5-11.0) | 9-8 (9.5-10.2) | 8.1 (8.0-8.5) | 23.1 (22.2-24.0) | 18.2 (17.5-20.0) | 21.9 (21.0-22.5) |
| <i>Passerella iliaca monoensis</i> | | | | | | | |
| 6 males: Mono Lake, Calif. | | | | | | | |
| 82.8 (79.0-85.0) | 85.0 (82.0-88.0) | 11.8 (11.0-12.8) | 11.4 (10.5-12.2) | 9.7 (9.0-10.2) | 24.2 (23.5-25.00) | 19.7 (19.0-21.2) | 23.2 (23.0-24.0) |
| <i>Passerella iliaca naryzosa</i> | | | | | | | |
| 6 males: Shasta and Siskiyou Counties, Calif. | | | | | | | |
| 81.0 (77.0-84.8) | 84.6 (82.0-87.2) | 12.6 (11.5-13.5) | 12.5 (11.8-13.5) | 10.4 (9.5-11.0) | 23.6 (22.5-25.0) | 18.9 (17.0-20.8) | 21.6 (21.0-22.2) |
| 7 males: Yosemite Park, Calif. | | | | | | | |
| 83.2 (81.5-86.0) | 85.5 (84.0-90.5) | 12.8 (11.2-13.8) | 12.3 (12.0-13.0) | 10.9 (10.0-11.5) | 23.8 (23.2-25.0) | 19.1 (18.2-20.0) | 23.3 (23.0-24.8) |
| 10 males: Kearsarge Pass, Calif. | | | | | | | |
| 80.9 (77.0-83.5) | 84.2 (79.5-88.5) | 12.5 (11.0-13.0) | 11.9 (11.0-13.0) | 10.1 (10.0-11.0) | 23.4 (22.2-25.0) | 18.8 (16.0-23.0) | 21.8 (18.0-24.0) |
| <i>Passerella iliaca stephensi</i> | | | | | | | |
| 9 males (adult and immature): Sierra Nevada, Fresno Co., Calif. | | | | | | | |
| 82.8 (80.5-85.5) | 87.0 (84.2-90.5) | 13.5 (13.0-15.0) | 12.9 (12.0-13.5) | 11.3 (10.5-12.0) | 24.4 (23.0-25.0) | 19.7 (18.5-20.5) | 23.7 (22.2-24.2) |
| 10 males: Sierra Nevada, Tulare Co., Calif. | | | | | | | |
| 83.4 (80.0-88.0) | 85.2 (81.0-91.0) | 14.6 (14.0-16.0) | 14.3 (13.8-15.2) | 12.2 (11.5-12.5) | 24.7 (23.8-26.0) | 20.3 (19.0-22.2) | 24.8 (24.2-26.0) |
| 5 males: Mt. Pinos, Ventura Co., Calif. | | | | | | | |
| 83.3 (81.5-85.0) | 85.6 (81.8-89.0) | 14.8 (14.0-15.5) | 14.3 (13.2-15.0) | 12.2 (11.2-13.0) | 24.9 (24.5-26.0) | 18.9 (18.0-20.0) | 23.6 (23.0-24.5) |
| 10 males: San Bernardino and San Jacinto Mts., Calif. | | | | | | | |
| 84.0 (82.0-87.0) | 86.0 (82.0-91.0) | 15.0 (14.0-15.8) | 14.1 (13.8-15.0) | 12.1 (11.2-12.8) | 24.3 (23.0-25.5) | 19.7 (19.0-20.5) | 24.5 (23.0-25.0) |

LIST OF SPECIMENS EXAMINED

PASSERELLA ILIACA ILIACA

| Collection | No. | Sex Age | Locality | Date | |
|------------------------------------|--------------|---------|---|--|---------------|
| Mus. Vert. Zool. | 4586 | ♂ ad. | Andreavsky, Yukon River, Alaska | June 3, 1895 | |
| | 4587 | ♂ ad. | St. Michael, Alaska | May 20, 1896 | |
| | 6087 | ♀ | Taunton, Mass. | April 13, 1887 | |
| | 6088 | ♂ | Eastford, Conn. | April 12, 1876 | |
| | 11283 | ♂ | "Massachusetts" | April 15, 1887 | |
| | 11284 | ♀ | Minneapolis, Minn. | April 16, 1887 | |
| | 30445 | ♂ ad. | Seaside, Monterey Co., Calif. | Dec. 26, 1918 | |
| Provincial Mus., Victoria, B.C. | 967 | ♂ | Sicamous, B.C. | Sept. 25, 1893 | |
| | | ♂ | Milton, Ontario, Canada | Oct. 10, 1884 | |
| | | ♀ | Milton, Ontario, Canada | Sept. 18, 1887 | |
| A. Brooks | ..... | ♀ ..... | Haywards, Alameda Co., Calif. | Dec. 12, 1898 | |
| W. O. Emerson | 2003 | ♂ | Nicasio, Marin Co., Calif. | Feb. 6, 1906 | |
| F. S. Daggett | 2805 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1897 | |
| J. Grinnell | 3233 | ♂ | Cape Blossom, Kotzebue Sound, Alaska | Aug. 1, 1898 | |
| | 3612 | ♂ im. | Kowak River, Alaska | Aug. 23, 1898 | |
| | 3613 | ♀ im. | Kowak River, Alaska | May 24, 1899 | |
| | 3615 | ♂ ad. | Kowak River, Alaska | May 24, 1899 | |
| | 3616 | ♀ ad. | Kowak River, Alaska | May 25, 1899 | |
| | 3614 | ♂ ad. | Princeton, New Jersey | Mar. 24, 1894 | |
|  | ..... | ♀ ..... | Fairfield, Conn. | Mar. 16, 1893 | |
| | A. B. Howell | 750 | ♀ | Santa Barbara, Santa Barbara Co., Calif. | Jan. 1, 1911 |
| | | 384 | ♀ | Burbank, Los Angeles Co., Calif. | Nov. 11, 1911 |
| | | 4932 | ♂ | Pasadena, Los Angeles Co., Calif. | Dec. 13, 1907 |
| J. E. Law | 789 | ..... | Lankershim, Los Angeles Co., Calif. | Mar. 22, 1908 | |
| | 2524 | ♀ | Pinery Cañon, Chiricahua Mts., Arizona | Nov. 6, 1914 | |
| J. & J. W. Mailliard | 4208 | ♀ | Plumas Co., Calif., at 4000 ft. | Sept. 27, 1898 | |
| | 4630 | ♂ | San Geronimo, Marin Co., Calif. | Jan. 26, 1901 | |
| G. F. Morcom | ..... | ♀ ..... | Grand Crossing, Cook Co., Ill. | April 5, 1884 | |
|  | ..... | ♂ ..... | Davis Station, Stark Co., Indiana | April 4, 1885 | |
|  | ..... | ♂ ..... | Davis Station, Stark Co., Indiana | Mar. 17, 1887 | |
|  | ..... | ♂ ..... | Davis Station, Stark Co., Indiana | Mar. 17, 1887 | |
| J. A. Munro | J 88 | ♂ | Toronto, Canada | Nov. 12, 1891 | |
| J. R. Pemberton | 867 | ♀ | Big Sur River, Monterey Co., Calif. | Dec. 22, 1903 | |
| W. M. Pierce | 1810 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 | |
| | 1811 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 | |
| H. S. Swarth | 4725 | ♂ | Roby, Cook Co., Ill. | Oct. 7, 1904 | |
| | 4726 | ♀ | Roby, Cook Co., Ill. | Oct. 7, 1904 | |
| | 4727 | ♀ | Roby, Cook Co., Ill. | Oct. 7, 1904 | |
| | 4759 | ♂ | Roby, Cook Co., Ill. | Oct. 18, 1904 | |
| | 4760 | ♂ | Roby, Cook Co., Ill. | Oct. 18, 1904 | |
| | 4761 | ♂ | Roby, Cook Co., Ill. | Oct. 18, 1904 | |
| | 4762 | ♀ ad. | Roby, Cook Co., Ill. | Oct. 18, 1904 | |
| | 4763 | ♀ im. | Roby, Cook Co., Ill. | Oct. 18, 1904 | |
| | 4809 | ♀ | Chicago, Ill. | Mar. 26, 1905 | |
| | 4810 | ♀ | Chicago, Ill. | Mar. 26, 1905 | |
| | 4811 | ♀ | Chicago, Ill. | Mar. 26, 1905 | |
| | 4848 | ♀ | Chicago, Ill. | April 9, 1905 | |
| | L. E. Wyman | 1180 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 31, 1917 |

PASSERELLA ILLIACA ALTIYAGANS

| Collection | No. | Sex Age | Locality | Date | |
|---|-----------------------|---------|--|--------------------------------------|----------------|
| Mus. Vert. Zool. | 12021 | ♀ | Pasadena, Los Angeles Co., Calif. | Jan. 19, 1907 | |
| | 24298 | ♀ im. | Cisco, Placer Co., Calif. | Oct. 9, 1913 | |
| | 25152 | ♀ im. | El Portal, Mariposa Co., Calif. | Dec. 15, 1914 | |
| | 26039 | ♂ ad. | Aapen Valley, Yosemite Park, Calif. | Oct. 14, 1915 | |
| | 26306 | ♂ | Varain, Mariposa Co., Calif. | Dec. 4, 1915 | |
| | 27166 | ♂ im. | Fyffe, Eldorado Co., Calif. | Nov. 24, 1916 | |
| | 27364 | ♂ | Horse Corral Meadow, Fresno Co., Calif. | Sept. 22, 1916 | |
| | 29990 | ♂ ad. | Jolon, Monterey Co., Calif. | Oct. 20, 1918 | |
| | 30630 | ♀ | Coulterville, Mariposa Co., Calif. | Dec. 25, 1918 | |
| | 30643 | ♀ | Coulterville, Mariposa Co., Calif. | Jan. 20, 1919 | |
| | 30644 | ♀ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | 30645 | ♀ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | Amer. Mus. Nat. Hist. | 41627 | | "California" | |
| 47735 | | ♂ | Mt. Lehman, B.C. | Sept. 8, 1889 | |
| 52995 |  | ..... | Fort Klamath, Klamath Co., Ore. | 1875 | |
| Carnegie Museum, Pittsburgh, Pa. Provincial Museum, Victoria, B.C. | 15365 | ♀ | Pasadena, Los Angeles Co., Calif. | Oct. 12, 1895 | |
| | 3825 | ♂ ad. | Mt. McLean, Lillooet, B.C. | July 19, 1916 | |
| | 3826 | ♂ juv. | Mt. McLean, Lillooet, B.C. | July 26, 1916 | |
| | 3827 | ♀ ad. | Mt. McLean, Lillooet, B.C. | July 15, 1916 | |
| | 3828 | ♂ juv. | Mt. McLean, Lillooet, B.C. | July 18, 1916 | |
| | 3829 | ♂ ad. | Mt. McLean, Lillooet, B.C. | July 21, 1916 | |
| | 3830 | ♂ ad. | Mt. McLean, Lillooet, B.C. | July 20, 1916 | |
| Victoria Memorial Museum | 2931 | ♀ ad. | Penticton, B.C. | April 21, 1903 | |
| | 2935 | ♂ ad. | Penticton, B.C. | April 22, 1903 | |
| | 3176 | ♂ ad. | Midway, B.C. | May 5, 1905 | |
| | 9713 | ♀ juv. | McGillvary Cr., Lillooet Dist., B.C. | Aug. 10, 1916 | |
| | 9714 | ♂ | McGillvary Cr., Lillooet Dist., B.C. | Aug. 11, 1916 | |
| | 9715 | ♂ | McGillvary Cr., Lillooet Dist., B.C. | Aug. 14, 1916 | |
| | 9716 | ♂ im. | McGillvary Cr., Lillooet Dist., B.C. | Aug. 18, 1916 | |
| | 9717 | ♀ im. | McGillvary Cr., Lillooet Dist., B.C. | Aug. 18, 1916 | |
| | 12713 | ♂ juv. | Jasper Park, Alberta | Aug. 1, 1918 | |
| | 12712 | ♂ | Jasper Park, Alberta | Aug. 26, 1918 | |
| | U. S. Nat. Mus. | 222832* | ♂ juv. | Moose Branch of Smoky River, Alberta | July 31, 1911 |
| | | 222833 | ♀ juv. | Moose Branch of Smoky River, Alberta | July 31, 1911 |
| | | 222834 | ♂ juv. | Moose Pass, B.C. | July 27, 1911 |
| 18044 | | ♀ ad. | Fort Crook, Shasta Co., Calif. | April 12, 1860 | |
| 94841 | | ♀ ad. | Fort Klamath, Klamath Co., Ore. | April 28, 1883 | |
| A. Brooks F. S. Daggett | 94844 | ♂ ad. | Fort Klamath, Klamath Co., Ore. | April 9, 1883 | |
| | 154159 | ♂ ad. | Columbia Falls, Flathead Co., Mont. | Sept. 24, 1896 | |
|  | ..... | ♂ ..... | Okanagan, B.C. | Oct. 18, 1913 | |
| | 4878 | ♀ | Switzer'a Camp, Los Angeles Co., Calif. | Oct. 21, 1896 | |
| | 4892 | ♀ | Switzer'a Camp, Los Angeles Co., Calif. | Oct. 24, 1896 | |
| | 4022 | ♂ | Arroyo Seco Cañon, Los Angeles Co., Calif. | Oct. 27, 1900 | |
| | D. R. Dickey | Ex.108 | ♂ im. | Sierra City, Sierra Co., Calif. | Sept. 24, 1916 |
| | | | ♀ | Volcan Mts., San Diego Co., Calif. | Feb. 6, 1884 |
| | W. O. Emerson | 222 | ♂ | Volcan Mta., San Diego Co., Calif. | Mar. 29, 1884 |
| | | 1977 | ♀ | Haywards, Alameda Co., Calif. | Nov. 19, 1898 |
| 1996 | | ♂ | Haywards, Alameda Co., Calif. | Dec. 4, 1898 | |
| 2170 | | ♀ | Haywards, Alameda Co., Calif. | Mar. 27, 1899 | |
| 4294 | | ♀ | Haywards, Alameda Co., Calif. | Oct. 17, 1906 | |
| J. Grinnell | | 608 | ♀ | Pasadena, Los Angeles Co., Calif. | Jan. 11, 1896 |
| S. G. Jewett | 1595 | ♀ | Pasadena, Los Angeles Co., Calif. | Oct. 13, 1896 | |
| | 1006 | ♀ | Government Id., Multnomah Co., Ore. | Dec. 15, 1912 | |
| | 2171 | ♂ | Millers, mouth of Deschutes River, Ore. | April 11, 1915 | |
| C. Lamb | ..... | ♂ ..... | Yermo, San Bernardino Co., Calif. | Sept. 22, 1910 | |
| J. & J. W. Mailliard | ×2056 | ♀ | Drytown, Amador Co., Calif. | Dec. 15, 1895 | |
| | ×1797 | ♀ | Drytown, Amador Co., Calif. | Dec. 29, 1895 | |
| | ×2057 | ♂ | "Plumas Co., Calif., alt. 4000" | April 24, 1899 | |

*Type.

PASSERELLA ILIACA ALTVAGANS—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|---------|---|--|----------------|
| J. & J. W. Mailliard | 3888 | ♀ | Fulton, Sonoma Co., Calif. | Jan. 24, 1899 |
| | 4254 | ♂ | Eagle Lake, Lassen Co., Calif. | Sept. 30, 1899 |
| | 7002 | ♀ | Modesto, Stanislaus Co., Calif. | Mar. 31, 1909 |
| L. H. Miller | ..... | ♂ ..... | Boquet Cañon, Los Angeles Co., Calif. | Oct. 8, 1915 |
|  | ..... | ♀ ..... | Boquet Cañon, Los Angeles Co., Calif. | Oct. 8, 1915 |
|  | ..... | ♂ ..... | Boquet Cañon, Los Angeles Co., Calif. | Oct. 8, 1915 |
|  | ..... | ♀ ..... | Boquet Cañon, Los Angeles Co., Calif. | Oct. 8, 1915 |
| J. R. Pemberton | 1360 | ♀ | Yucaipa, San Bernardino Co., Calif. | Jan. 7, 1917 |
| | 1361 | ♀ | Yucaipa, San Bernardino Co., Calif. | Feb. 11, 1917 |
| W. M. Pierce | 1313 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 14, 1916 |
|  | ..... | ..... | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 17, 1916 |
|  | ..... | ♂ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 28, 1916 |
|  | ..... | ♀ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 2, 1917 |
|  | ..... | ♀ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 2, 1917 |
|  | ..... | ♀ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1917 |
| | 1747 | ♂ ad. | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 8, 1918 |
| | 1733 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1765 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 11, 1919 |
| | 1763 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 11, 1919 |
| | 1767 | ♂ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 |
| | 1776 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 16, 1919 |
| | 1798 | ♂ | Santa Ana Cañon (near Corona), Riverside Co., Calif. | Jan. 26, 1919 |
| | 1819 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 |
| 1829 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 | |
| C. H. Richardson | 992 | ..... | Piute Mts., Kern Co., Calif. | Nov. 27, 1907 |
| | 1001 | ♀ | Piute Mts., Kern Co., Calif. | Dec. 3, 1907 |
| H. S. Swarth | 377 | ♀ | Los Angeles, Calif. | Dec. 14, 1896 |
| | 772 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 8, 1897 |
| | 1744 | ♂ | Los Angeles, Calif. | Nov. 24, 1900 |
| | 1834 | ♀ | Millard's Cañon, Los Angeles Co., Calif. | Feb. 11, 1901 |
| G. Willett | 2040 | ♀ | San Antonio Cañon, Los Angeles Co., Calif. | Dec. 29, 1916 |
| L. E. Wyman | 1168 | ♂ | Newhall, Los Angeles Co., Calif. | Dec. 31, 1916 |
| | 1185 | ..... | Santa Monica Mts., Los Angeles Co., Calif. | Feb. 11, 1917 |

PASSERELLA ILIACA UNALASCHENSIS

| Collection | No. | Sex Age | Locality | Date | |
|------------------|---------------------|---------|--|------------------------------------|--------------|
| Mus. Vert. Zool. | 4585 ¹ | ♂ ad. | Ounalaska, Alaska | June 4, 1894 | |
| | 6096 | ..... | Berkeley, Alameda Co., Calif. | Feb. 15, 1899 | |
| | 17351 | ♂ | Helena, Trinity Co., Calif. | Feb. 17, 1911 | |
| | 23282 | ♂ im. | Blue Cañon, Placer Co., Calif. | Oct. 15, 1912 | |
| | 23284 | ♀ im. | Blue Cañon, Placer Co., Calif. | Oct. 18, 1912 | |
| | 23451 ¹ | ..... | Escondido, San Diego Co., Calif. | Feb. 7, 1913 | |
| | 25140 | ♀ im. | El Portal, Mariposa Co., Calif. | Nov. 30, 1914 | |
| | 25141 | ♀ | El Portal, Mariposa Co., Calif. | Dec. 4, 1914 | |
| | 25142 | ♂ im. | El Portal, Mariposa Co., Calif. | Dec. 5, 1914 | |
| | 25143 | ♂ im. | El Portal, Mariposa Co., Calif. | Dec. 17, 1914 | |
| | 25144 | ♀ im. | El Portal, Mariposa Co., Calif. | Dec. 17, 1914 | |
| | 25145 | ♂ | Snelling, Merced Co., Calif. | Jan. 6, 1915 | |
| | 26026 | ♂ im. | Yosemite Trail, Yosemite Park, Calif. | Oct. 30, 1915 | |
| | 26028 | ♀ im. | Yosemite Creek, Yosemite Park, Calif. | Oct. 6, 1915 | |
| | 26030 | ♀ im. | Yosemite Valley, Calif. | Oct. 28, 1915 | |
| | 26031 | ♂ im. | Near Yosemite Point, Yosemite Park, Calif. | Oct. 30, 1915 | |
| | 10605 | ♀ | Oakland, Alameda Co., Calif. | Nov. 12, 1909 | |
| | 30642 | ♀ | Coulterville, Mariposa Co., Calif. | Jan. 20, 1919 | |
| | Am. Mus. Nat. Hist. | 90832 | ♂ ad. | Herendeen Bay, Alaska Pen., Alaska | May 19, 1903 |
| | | 90833 | ♂ ad. | Muller Bay, Alaska Pen., Alaska | May 24, 1903 |
| 90834 | | ♀ ad. | Muller Bay, Alaska Pen., Alaska | May 26, 1903 | |
| 90835 | | ♂ ad. | Muller Bay, Alaska Pen., Alaska | June 1, 1903 | |

¹See page 130.

PASSERELLA ILIACA UNALASCHENSIS—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|--------------------|---------|---|--|
| Am. Mus. Nat. Hist. | 90836 | ♂ ad. | Muller Bay, Alaska Pen., Alaska | June 6, 1903 |
| | 90837 | ♂ ad. | Muller Bay, Alaska Pen., Alaska | June 6, 1903 |
| | 90838 | ♂ ad. | Muller Bay, Alaska Pen., Alaska | June 8, 1903 |
| | 90839 | ♀ ad. | Muller Bay, Alaska Pen., Alaska | June 12, 1903 |
| Calif. Acad. Sci. | ..... | ♂ ..... | Ketchikan, s.e. Alaska | April 12, 1916 |
|  | ..... | ♀ ..... | Ketchikan, s.e. Alaska | April 15, 1916 |
| Carnegie Mus. | 32666 | ..... | Salem, Marion Co., Ore. | April 24, 1909 |
| Mus. Hist. Sci. Art | 2149 ¹ | ♂ im. | San Antonio Cañon, San Gabriel Mts., Calif. | Oct. 19, 1917 |
| | 2156 ¹ | ♂ | San Antonio Cañon, San Gabriel Mts., Calif. | Oct. 23, 1917 |
| | 2158 ¹ | ♂ | Bear Flat, San Gabriel Mts., Calif. | Oct. 22, 1917 |
| | 2162 ¹ | ♀ im. | San Antonio Cañon, San Gabriel Mts., Calif. | Oct. 19, 1917 |
| U. S. Nat. Mus. | 2154 ¹ | ♂ | San Antonio Cañon, San Gabriel Mts., Calif. | Oct. 19, 1917 |
| | 81390 | ♂ ad. | Little Koniushi Id., Shumagin Ids., Alaska | July 16, 1880 |
| | 81391 | ♀ ad. | Little Koniushi Id., Shumagin Ids., Alaska | July 16, 1880 |
| | 170231 | ♂ ad. | Kukak Bay, Alaska Pen., Alaska | July 1, 1899 |
| Victoria Mem. Mus. | 4080 | ♂ | Departure Bay, Vancouver Id., B. C. | Jan. 5, 1910 |
| | 4081 | ♂ | Departure Bay, Vancouver Id., B. C. | Jan. 5, 1910 |
| | 4105 | ♀ | Departure Bay, Vancouver Id., B. C. | Mar. 26, 1910 |
| | A 130 ¹ | ♀ | Topa Topa Lodge, Ventura Co., Calif. | May 2, 1913 |
| D. R. Dickey | 25392 | ♂ | Lakeport, Lake Co., Calif. | Dec. 13, 1891 |
| | 1673 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 |
| | 1820 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 12, 1896 |
| | 1821 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 12, 1896 |
| | 2097 | ♂ | Pasadena, Los Angeles Co., Calif. | Feb. 22, 1897 |
| | 3237 | ♀ | Pasadena, Los Angeles Co., Calif. | Oct. 31, 1897 |
| | 3280 | ♂ | Santa Catalina Id., Calif. | Dec. 24, 1897 |
| | 4933 ¹ | ♂ | Pasadena, Los Angeles Co., Calif. | Oct. 28, 1907 |
| | 4962 ¹ | ♀ | Santa Catalina Id., Calif. | Feb. 15, 1910 |
| | 2139 ¹ | ♀ | Tacoma, Pierce Co., Wash. | Jan. 10, 1913 |
| A. B. Howell | 6823 ¹ | ♂ | Bluff Lake, San Bernardino Mts., Calif. | Oct. 7, 1918 |
| | 6823 ¹ | ♂ | Bluff Lake, San Bernardino Mts., Calif. | Oct. 11, 1918 |
| | 6825 ¹ | ♂ | Bluff Lake, San Bernardino Mts., Calif. | Oct. 12, 1918 |
| | 6829 ¹ | ♀ | Bluff Lake, San Bernardino Mts., Calif. | Oct. 12, 1918 |
| | 1314 | ..... | Pomona, Los Angeles Co., Calif. | Dec. 25, 1900 |
| | ×3897 | ♀ | Portland, Multnomah Co., Ore. | Nov. 7, 1912 |
| J. E. Law | ×1798 | ♂ | Drytown, Amador Co., Calif. | Dec. 8, 1895 |
| | ×2055 | ..... | Drytown, Amador Co., Calif. | Feb. 29, 1895 |
| J. & J. W. Mailliard | 1283 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 6, 1916 |
| | 1284 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 6, 1916 |
| | 1297 ¹ | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 8, 1916 |
| | ¹ | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 28, 1916 |
| | ¹ | ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1917 |
|  | ..... | ♂ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 2, 1917 |
| | 1744 ¹ | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 1, 1918 |
| | 1722 ¹ | ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1728 ¹ | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1770 ¹ | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 |
| | 1795 ¹ | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 23, 1919 |
| | 1809 ¹ | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | 1813 ¹ | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | 1814 ¹ | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | 1821 ¹ | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | 1823 ¹ | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | 1824 ¹ | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | 1825 ¹ | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | 1827 ¹ | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
| | H. S. Swarth | 1832 | ♂ | Millard's Cañon, Los Angeles Co., Calif. | Feb. 11, 1901 |
| 4473 | | ♀ | Head of Piru Creek, Ventura Co., Calif. | May 3, 1904 |
| 2042 ¹ | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 16, 1915 |
| G. Willett | 1182 ¹ | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 31, 1917 |
| | 1199 ¹ | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Mar. 14, 1917 |

¹See page 130.

PASSERELLA ILIACA INSULARIS

| Collection | No. | Sex Age | Locality | Date | |
|--------------------------------|-----------------------|-------------------------------|--|-----------------------------------|----------------|
| Mus. Vert. Zool. | 4128 | ..... | San Francisco, Calif. | ..... |  |
| | 5285 | ♀ | Oakland, Alameda Co., Calif. | Mar. 11, 1901 | |
| | 5286 | ♀ | Oakland, Alameda Co., Calif. | Mar. 14, 1901 | |
| | 6095 | ♂ | Alta, Placer Co., Calif. | Nov. 7, 1902 | |
| | 6098 | ♀ | Piedmont, Alameda Co., Calif. | Jan. 16, 1897 | |
| | 7195 | ♀ | Nicasio, Marin Co., Calif. | Feb. 25, 1909 | |
| | 9655 | ♂ | Kuiu Island, Southeastern Alaska | April 30, 1909 | |
| | 10076 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1897 | |
| | 11294 | ♀ | Berkeley, Alameda Co., Calif. | Jan. 16, 1892 | |
| | 16255 | ♀ | Parksville, Vancouver Id., B.C. | April 26, 1910 | |
| | 23283 | ♀ im. | Blue Cañon, Placer Co., Calif. | Oct. 18, 1912 | |
| | 23285 | ♀ im. | Blue Cañon, Placer Co., Calif. | Oct. 19, 1912 | |
| | 25146 | ♂ ad. | El Portal, Mariposa Co., Calif. | Nov. 23, 1914 | |
| | 25147 | ♂ ad. | El Portal, Mariposa Co., Calif. | Dec. 17, 1914 | |
| | 26024 | ♀ im. | Aspen Valley, Yosemite Park, Calif. | Oct. 14, 1915 | |
| | 26025 | ♂ im. | Feliciana Mt., Mariposa Co., Calif. | Oct. 28, 1915 | |
| | 26027 | ♂ im. | Yosemite Trail, Yosemite Park, Calif. | Oct. 30, 1915 | |
| | 27370 | ♂ im. | Hume, Fresno Co., Calif. | Sept. 25, 1916 | |
| | 27371 | ♀ ad. | Hume, Fresno Co., Calif. | Sept. 25, 1916 | |
| | Amer. Mus. Nat. Hist. | 41626 | | "California" | |
| | | 47727 | | Westminster Junction, B.C. | April 27, 1889 |
| | | 84119 | ♀ | Nicasio, Marin Co., Calif. | Feb. 11, 1881 |
| | | 84122 | ♀ | Stockton, San Joaquin Co., Calif. | April 8, 1878 |
| | | 88756 | ♀ | Echo, Eldorado Co., Calif. | Sept. 23, 1896 |
| | Calif. Acad. Sci. | | ♀ | Ketchikan, s.e. Alaska | April 12, 1916 |
| | | | ♀ | Ketchikan, s.e. Alaska | April 15, 1916 |
| | | | ♀ | Ketchikan, s.e. Alaska | April 16, 1916 |
| Carnegie Museum, Pittsburgh | 15366 | ♂ | Fort Klamath, Klamath Co., Ore. | April 13, 1883 | |
| | 15361 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 | |
| | 15362 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 | |
| | 29694 | ♂ | New Westminster, B.C. | Mar. 22, 1889 | |
| U. S. Nat. Mus. | 52475* | ♂ ad. | Kodiak, Kodiak Id., Alaska | May 17, 1868 | |
| | 54542 | juv. | Kodiak, Kodiak Id., Alaska | July 26, 1868 | |
| | 81387 | ♂ ad. | St. Paul, Kodiak Id., Alaska | July 12, 1880 | |
| | 81388 | ♀ ad. | St. Paul, Kodiak Id., Alaska | July 13, 1880 | |
| | 115819 | ♂ | Kodiak Id., Alaska | Aug. 15, 1888 | |
| | 115822 | ♀ | Old Harbor, Kodiak Id., Alaska | Aug. 11, 1888 | |
| | 131738 | ♂ ad. | Kodiak Id., Alaska | April 14, 1892 | |
| | 131739 | ♂ ad. | Kodiak Id., Alaska | April 14, 1892 | |
| | 150490 | ♂ ad. | Kodiak Id., Alaska | May 30, 1894 | |
| | 150491 | ♀ ad. | Kodiak Id., Alaska | June 4, 1894 | |
| | 150492 | ♀ ad. | Kodiak Id., Alaska | June 14, 1894 | |
| | 150493 | ♀ ad. | Kodiak Id., Alaska | June 20, 1894 | |
| | 150940 | ♂ ad. | Kodiak Id., Alaska | June 21, 1893 | |
| | 150941 | ♂ ad. | Kodiak Id., Alaska | May 30, 1894 | |
| | 170229 | ♀ ad. | Kodiak Id., Alaska | July 20, 1899 | |
| | 170232 | ♂ ad. | Kodiak Id., Alaska | July 3, [1899?] | |
| 170233 | ♂ ad. | Kodiak Id., Alaska | July 3, [1899?] | | |
| 160672 | ♀ ad. | Howkan, Long Id., s.e. Alaska | April 25, 1897 | | |
| F. S. Daggett | 2807 | ♀ | Nicasio, Marin Co., Calif. | Feb. 6, 1906 | |
| | 881 | ♀ | Switzer's Trail, Los Angeles Co., Calif. | Feb. 25, 1893 | |
| | 3161 | ♂ | Switzer's Camp, Los Angeles Co., Calif. | Oct. 21, 1896 | |
| | 4868 | ♀ | Switzer's Camp, Los Angeles Co., Calif. | Oct. 21, 1896 | |
| | 4869 | ♀ | Barley Flats, Los Angeles Co., Calif. | Oct. 23, 1896 | |
| | 4872 | ♀ | Switzer's Camp, Los Angeles Co., Calif. | Oct. 24, 1896 | |
| | 100 | ♂ ad. | St. Paul, Kodiak Id., Alaska | May, 1880 | |
| W. O. Emerson | 147 | ♂ | Volcan Mts., San Diego Co., Calif. | Feb. 12, 1884 | |
| | 8 | ♀ | Hayward, Alameda Co., Calif. | Jan. 3, 1881 | |
| | 1240 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 30, 1896 | |
| | 1652 | ♂ | Hayward, Alameda Co., Calif. | Jan. 10, 1898 | |
| | 1994 | ♀ | Hayward, Alameda Co., Calif. | Dec. 4, 1898 | |

*Type.

PASSERELLA ILIACA INSULARIS—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|-------|---------|--|---------------|
| W. O. Emerson | 1997 | ♂ | Hayward, Alameda Co., Calif. | Dec. 4, 1898 |
| | 2550 | ♀ | Hayward, Alameda Co., Calif. | Jan. 19, 1901 |
| | 3228 | ♂ | Hayward, Alameda Co., Calif. | Jan. 22, 1902 |
| J. H. Fleming | 18110 | ♂ | Nicasio, Marin Co., Calif. | Jan. 28, 1902 |
| | 5226 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 19, 1896 |
| | 5225 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 7, 1900 |
| | 7756 | ♂ | Volcan Mts., San Diego Co., Calif. | Jan. 31, 1884 |
| | 25391 | ..... | Lakeport, Lake Co., Calif. | Sept. 7, 1891 |
| | 25394 | ♂ | Lakeport, Lake Co., Calif. | Dec. 20, 1893 |
| | 25393 | ♂ | Lakeport, Lake Co., Calif. | Dec. 28, 1891 |
| | 25395 | ..... | Lakeport, Lake Co., Calif. | Dec. 30, 1893 |
| J. Grinnell | 1817 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 12, 1896 |
| | 1819 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 12, 1896 |
| | 1825 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 12, 1896 |
| | 3236 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1897 |
| | 3327 | ♀ | Santa Catalina Id., Calif. | Dec. 27, 1897 |
|  | ..... | ♀ ..... | San Geronimo, Marin Co., Calif. | Oct. 6, 1895 |
|  | ..... | ♂ ..... | San Geronimo, Marin Co., Calif. | Oct. 3, 1897 |
|  | ..... | ♀ ..... | San Geronimo, Marin Co., Calif. | Oct. 10, 1897 |
|  | ..... | ♀ ..... | San Geronimo, Marin Co., Calif. | Jan. 12, 1897 |
|  | ..... | ♀ ..... | San Geronimo, Marin Co., Calif. | Feb. 13, 1897 |
|  | ..... | ♂ ..... | San Geronimo, Marin Co., Calif. | Nov. 24, 1897 |
| A. B. Howell | 4481 | ♀ im. | Pescadero Cr., Santa Cruz Mts., Calif. | Nov. 27, 1900 |
| | 4963 | ♂ | Tuhunga Cañon, Los Angeles Co., Calif. | Feb. 15, 1911 |
| | 4965 | ♀ | Pasadena, Los Angeles Co., Calif. | Nov. 20, 1911 |
| S. G. Jewett | 532 | ♂ | "Clackamas Co.," Ore. | Feb. 16, 1907 |
| J. E. Law | 1181 | ..... | Palo Alto, Santa Clara Co., Calif. | Dec. 3, 1898 |
| J. & J. W. Mailliard | 2288 | ♀ | San Geronimo, Marin Co., Calif. | Jan. 12, 1897 |
| | 4811 | ♂ | San Geronimo, Marin Co., Calif. | Dec. 31, 1901 |
| | 7256 | ♂ | San Geronimo, Marin Co., Calif. | Feb. 17, 1879 |
| G. F. Morcom | ..... | ♂ ..... | Los Angeles, Los Angeles Co., Calif. | Jan. 17, 1897 |
|  | ..... | ♀ ..... | Los Angeles, Los Angeles Co., Calif. | Jan. 17, 1897 |
|  | ..... | ♀ ..... | Millard's Cañon, Los Angeles Co., Calif. | Feb. 11, 1901 |
| H. S. Swarth | 771 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 6, 1897 |
| | 937 | ♀ | Los Angeles, Los Angeles Co., Calif. | Nov. 15, 1898 |
| | 1023 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 13, 1899 |
| G. Willett | 1669 | ♂ | Stony Ford, Colusa Co., Calif. | Mar. 5, 1915 |
| | 2043 | ♂ | San Antonio Cañon, Los Angeles Co., Calif. | Jan. 5, 1917 |

PASSERELLA ILIACA SINUOSA

| Collection | No. | Sex Age | Locality | Date |
|------------------|-----------|--------------------|---|--|
| Mus. Vert. Zool. | 1535-1550 | 11♂ ad. 5♀ ad. | Hinchinbrook Id., Prince William Sd., Alaska | June 25 to July 2, 1908 |
| | 1551-1565 | 2♂ ad. 5♀ ad. | La Touche Id., Prince William Sd., Alaska | July 19 to Aug. 8, 1908 |
| | | 5♂ juv. 3♀ juv. | | |
| | | 1566-1590 | 9♂ ad. 10♀ ad. 1♀ im. 4♂ juv. 1♀ juv. | Montague Id., Prince William Sd., Alaska | July 6 to July 31, 1908 |
| | 1591 | ♂ ad. | Hawkin's Id., Prince William Sd., Alaska | June 22, 1908 |
| | 1592 | ♂ ad. | Cordova, Prince William Sd., Alaska | June 6, 1908 |
| | 1593* | ♂ ad. | Knight Id., Prince William Sd., Alaska | Aug. 26, 1908 |
| | 1594 | ♂ im. | Knight Id., Prince William Sd., Alaska | Aug. 24, 1908 |
| | 1595 | ♀ ad. | Green Id., Prince William Sd., Alaska | July 14, 1908 |

*Type.

PASSERELLA ILIACA SINUOSA—(Continued)

| Collection | No. | Sex Age | Locality | Date |
|------------------|--------|-----------|---|----------------|
| Mus. Vert. Zool. | 1596 | ♂ ad. | Green Id., Prince William Sd., Alaska | July 16, 1908 |
| | 1597 | ♂ ad. | Green Id., Prince William Sd., Alaska | July 16, 1908 |
| | 1598 | ♂ juv. | Green Id., Prince William Sd., Alaska | July 14, 1908 |
| | 1599 | ♂ juv. | Green Id., Prince William Sd., Alaska | July 14, 1908 |
| | 1600 | ♂ | Port Nell Juan, Prince William Sd., Alaska | Aug. 11, 1908 |
| | 1601 | ♂ im. | Port Nell Juan, Prince William Sd., Alaska | Aug. 15, 1908 |
| | 1602 | ♀ im. | Port Nell Juan, Prince William Sd., Alaska | Aug. 16, 1908 |
| | 1603 | ♂ im. | Wortman's, Prince William Sd., Alaska | Aug. 31, 1908 |
| | 1604 | ♂ im. | Wortman's Prince William Sd., Alaska | Sept. 1, 1908 |
| | 1605 | im. | Wortman's, Prince William Sd., Alaska | Sept. 2, 1908 |
| | 6092 | ♀ | Pescadero, San Mateo Co., Calif. | Dec. 30, 1900 |
| | 6594 | ♂ | Oakland, Alameda Co., Calif. | Sept. 28, 1908 |
| | 7070 | ♀ | Berkeley, Alameda Co., Calif. | Jan. 18, 1909 |
| | 7194 | ♂ | Nicasio, Marin Co., Calif. | Feb. 25, 1909 |
| | 11287 | ♂ | Riverside, Riverside Co., Calif. | Jan. 5, 1889 |
| | 11289 | ♀ | Oakland, Alameda Co., Calif. | Jan. 23, 1890 |
| | 11293 | ♀ | Berkeley, Alameda Co., Calif. | Dec. 9, 1891 |
| | 11295 | ♀ | Berkeley, Alameda Co., Calif. | Jan. 5, 1889 |
| | 12022 | ♀ | Azusa, Los Angeles Co., Calif. | Mar. 28, 1906 |
| | 16867 | ♀ | Kunz, Trinity Co., Calif. | Sept. 22, 1910 |
| | 16868 | ♂ | Little Van Duzen R., Humboldt Co., Calif. | Sept. 23, 1910 |
| | 17234 | ♂ | Bolinas, Marin Co., Calif. | Mar. 31, 1911 |
| | 23286- | 2♂ ad. | Blue Cañon, Placer Co., Calif. | Oct. 14 to |
| | 23293 | 3♂ im. | | Oct. 21, 1912 |
| | | 3♀ im. | | |
| | 24271- | 4♂ im. | Cisco, Placer Co., Calif. | Oct. 1 to |
| | 24274 | | | Oct. 10, 1912 |
| | 25148- | 6♂ | El Portal, Mariposa Co., Calif. | Nov. 24 to |
| | 25151, | 1♀ | | Dec. 17, 1914 |
| | 25153- | | | |
| | 25155 | | | |
| | 25869 | im. | Berkeley, Alameda Co., Calif. | Oct. 12, 1914 |
| | 26019 | ♀ ad. | Aspen Valley, Yosemite Park, Calif. | Oct. 14, 1915 |
| | 26020 | ♂ im. | Aspen Valley, Yosemite Park, Calif. | Oct. 16, 1915 |
| | 26021 | ♂ | Aspen Valley, Yosemite Park, Calif. | Oct. 16, 1915 |
| | 26022 | ♂ ad. | Aspen Valley, Yosemite Park, Calif. | Oct. 17, 1915 |
| | 26023 | ♂ im. | Gentry's, Yosemite Park, Calif. | Oct. 21, 1915 |
| | 26304 | ♂ | Varain, Mariposa Co., Calif. | Nov. 30, 1915 |
| | 26305 | ♂ | Varain, Mariposa Co., Calif. | Dec. 1, 1915 |
| | 26307 | ♂ im. | La Grange, Stanislaus Co., Calif. | Dec. 10, 1915 |
| | 26421 | ♀ | Corvallis, Benton Co., Ore. | Jan. 3, 1908 |
| | 27154 | ♂ | San Antonio Cañon, San Gabriel Mts., Calif. | Dec. 1, 1916 |
| | 27155 | ♀ | San Antonio Cañon, San Gabriel Mts., Calif. | Dec. 1, 1916 |
| | 27167 | ♂ | Fyffe, Eldorado Co., Calif. | Nov. 24, 1916 |
| | 27168 | ♀ im. | Fyffe, Eldorado Co., Calif. | Dec. 1, 1916 |
| | 27365 | ♂ | Horse Corral Mdw., Fresno Co., Calif. | Sept. 22, 1916 |
| | 27366 | ♂ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 21, 1916 |
| | 27368 | ♂ | Minkler, Fresno Co., Calif. | Oct. 10, 1916 |
| | 27369 | ♀ | Horse Corral Mdw., Fresno Co., Calif. | Sept. 22, 1916 |
| | 29485 | ♀ im. | Berkeley, Alameda Co., Calif. | Oct. 18, 1918 |
| | 27372 | ♂ | Hume, Fresno Co., Calif. | Sept. 26, 1916 |
| | 30001 | im. | Soledad, Monterey Co., Calif. | Dec. 7, 1918 |
| | 30002 | ♂ im. | San Lucas, Monterey Co., Calif. | Nov. 24, 1918 |
| | 30003 | ♂ im. | Jolon, Monterey Co., Calif. | Oct. 18, 1918 |
| | 30004 | ♂ ad. | Jolon, Monterey Co., Calif. | Oct. 18, 1918 |
| | 30005 | ♂ im. | Jolon, Monterey Co., Calif. | Oct. 18, 1918 |
| | 30006 | ♂ ad. | Morro, S. L. O. Co., Calif. | Sept 29, 1918 |
| | 30429- | 5♂ | Seaside, Monterey Co., Calif. | Dec. 25, 1918 |
| | 30437, | 7♀ | | to |
| | 30442- | | | Feb. 5, 1919 |
| | 30444 | | | |

PASSERELLA ILIACA SINUOSA—(Continued)

| Collection | No. | Sex Age | Locality | Date | |
|-------------------------------|------------------------------------|------------|--|--|----------------|
| Mus. Vert. Zool. | 30438- | 1♂ | Monterey, Monterey Co., Calif. | Jan. 2, 1919 | |
| | 30441 | 3♀ | | | |
| | 30628, | 6♂ | Coulterville, Mariposa Co., Calif. | Dec. 25, 1918 | |
| | 30629, | 4♀ | | to | |
| | 30634- | | | Jan. 27, 1919 | |
| | 30641 | | | | |
| | 30660- | 3♀ | Berkeley, Alameda Co., Calif. | Dec. 24, 1918 | |
| | 30662 | | | | |
| | 30667 | ♀ | Berkeley, Alameda Co., Calif. | Jan. 3, 1919 | |
| | American Museum Nat. Hist. | 76386 | ♀ ad. | Homer, Kenai Peninsula, Alaska | June 5, 1901 |
| 76387 |  | ..... | Kenai Mts., Alaska | Aug. 9, 1901 | |
| 76378 | | juv. | Kenai Mts., Alaska | Aug. 9, 1901 | |
| 76388 | | ♀ | Kenai Mts., Alaska | Aug. 11, 1901 | |
| 76389 |  | ..... | Homer, Kenai Peninsula, Alaska | Aug. 28, 1901 | |
| 90840 | | ♂ ad. | Seldovia, Kenai Peninsula, Alaska | July 17, 1903 | |
| 47728 | | ♂ | Mt. Lehman, B.C. | Sept. 22, 1889 | |
| 47729 |  | ..... | Vancouver Id., B.C. | ..... |  |
| 88758 | | ♂ | Echo, Eldorado Co., Calif. | Oct. 4, 1896 | |
| 88757 | | ♂ | Echo, Eldorado Co., Calif. | Oct. 7, 1896 | |
| Calif. Acad. Sci. | | 11433 | ♂ | Lakeport, Lake Co., Calif. | Feb. 15, 1908 |
| | | 11434 | ♂ | Lakeport, Lake Co., Calif. | Feb. 11, 1908 |
| | | 11435 | ♂ | Lakeport, Lake Co., Calif. | Feb. 11, 1908 |
| | 34563 | ♂ | San Gabriel Cañon, Los Angeles Co., Calif. | Jan. 27, 1908 | |
| | 34564 | ♀ | San Gabriel Cañon, Los Angeles Co., Calif. | Jan. 22, 1908 | |
| Carnegie Museum Pittsburgh | 34618 | ♀ | San Gabriel Cañon, Los Angeles Co., Calif. | Feb. 14, 1908 | |
| | 49253 | ♂ | Seward, Kenai Peninsula, Alaska | May 22, 1913 | |
| | | ♂ | San Francisco, Calif. | Oct. 5, 1898 | |
| | Field Museum Nat. Hist. | 48894 | ♂ | San Bruno, San Mateo Co., Calif. | Dec. 26, 1901 |
| | | 48895 | ♂ | Los Gates, Santa Clara Co., Calif. | Jan. 24, 1894 |
| Mus. Hist. Sci. Art | 48897 | ♂ | Clipper Gap, Placer Co., Calif. | Feb. 20, 1902 | |
| | 2150 | ♀ | San Antonio Cañon, Los Angeles Co., Calif. | Oct. 19, 1917 | |
| | 2151 | ♀ | San Antonio Cañon, Los Angeles Co., Calif. | Oct. 19, 1917 | |
| | 2152 | ♀ | San Antonio Cañon, Los Angeles Co., Calif. | Oct. 19, 1917 | |
| | 2155 | ♀ | San Antonio Cañon, Los Angeles Co., Calif. | Oct. 24, 1917 | |
| | 2157 | ♀ im. | Bear Flat, Los Angeles Co., Calif. | Oct. 21, 1917 | |
| | 2159 | ♀ ad. | Bear Flat, Los Angeles Co., Calif. | Oct. 21, 1917 | |
| | Provincial Mus., Victoria, B.C. | 963 | ♀ | Victoria, B.C. | Oct. 12, 1896 |
| 965 | | ♀ | Saanich, B.C. | April 7, 1896 | |
| 3832 | | ♂ | Victoria, B.C. | Dec. 1, 1914 | |
| 3833 | | ♂ | Victoria, B.C. | Jan. 27, 1914 | |
| 3835 | | ♀ | Victoria, B.C. | Jan. 18, 1916 | |
| U. S. Nat. Mus. | 170228 | ♂ ad. | Virgin Bay, Alaska | June 26, 1899 | |
| | 170230 | ♂ ad. | Virgin Bay, Alaska | June 27, 1899 | |
| | 115823 | ♂ | Middleton Id., Alaska | Aug. 26, 1888 | |
| | 115824 | ♂ | Middleton Id., Alaska | Aug. 26, 1888 | |
| | Victoria Mem. Museum | 1623 | ♂ | Victoria, B.C. | April 29, 1893 |
| 4082 | | ♂ | Departure Bay, Vancouver Id., B.C. | Jan. 6, 1910 | |
| 4091 | | ♂ | Departure Bay, Vancouver Id., B.C. | Feb. 23, 1910 | |
| 4095 | | ♂ | Departure Bay, Vancouver Id., B.C. | Feb. 25, 1910 | |
| A. Brooks | ..... | ♂ ..... | Chilliwack, B.C. | Mar. 22, 1889 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Dec. 9, 1912 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Dec. 9, 1912 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Dec. 9, 1912 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Dec. 9, 1912 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Jan. 4, 1913 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Jan. 11, 1913 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Jan. 11, 1913 | |
|  | ..... | ♂ ..... | Monterey, Calif. | Mar. 13, 1913 | |
| | L. B. Bishop | 30650 | ♂ | Beverly Hills, Los Angeles Co., Calif. | Feb. 1, 1918 |
| F. S. Daggett | | 883 | ♀ | Pasadena, Los Angeles Co., Calif. | Nov. 30, |

PASSERELLA ILIACA SINUOSA—(Continued)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|---------|-------------------------------------|---|----------------|
| F. S. Daggett | 3177 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Feb. 1, 1896 |
| | 4867 | ♀ | Arroyo Seco, Los Angeles Co., Calif. | Oct. 13, 1896 |
| | 4912 | ♀ | Switzer's Camp, Los Angeles Co., Calif. | Oct. 24, 1896 |
| | 8088 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 2, 1915 |
| W. L. Dawson | ..... | ♂ ..... | Santa Barbara, Santa Barbara Co., Calif. | Dec. 9, 1912 |
|  | ..... | ♂ ..... | "Santa Barbara Co." | Jan. 11, 1913 |
|  | ..... | ♀ ..... | "Santa Barbara Co." | Nov. 17, 1913 |
| D. R. Dickey | 20 | ♂ | Eureka, Humboldt Co., Calif. | Mar. 3, 1912 |
| | Ex.106 | ♂ | Sierra City, Sierra Co., Calif. | Sept. 22, 1916 |
| | Ex.107 | ♂ | Sierra City, Sierra Co., Calif. | Sept. 22, 1916 |
| | C 311 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 23, 1915 |
| | C 329 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 26, 1915 |
| | C 354 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 29, 1915 |
| | C 365 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 29, 1915 |
| | C 371 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 30, 1915 |
| W. O. Emerson | 1198 | ♂ | Monterey, Monterey Co., Calif. | Dec. 16, 1896 |
| | 4348 | ♂ | Camp Meeker, Sonoma Co., Calif. | Oct. 27, 1906 |
| | 1303 | ♂ | Hayward, Alameda Co., Calif. | Feb. 15, 1897 |
| J. H. Fleming | 18107 | ♀ | "San Mateo Co.," Calif. | Oct. 24, 1900 |
| | 18108 | ..... | Lebanon, Linn Co., Ore. | Jan. 3, 1909 |
| J. Grinnell | 507 | ♀ | Pasadena, Los Angeles Co., Calif. | Nov. 16, 1895 |
| | 1992 | ♂ | Pasadena, Los Angeles Co., Calif. | Jan. 16, 1896 |
| | 3289 | ♀ | Santa Catalina Id., Los Angeles Co., Calif. | Dec. 25, 1897 |
| | 57 | ..... | Siskiyou Mts., Siskiyou Co., Calif. | Oct. 9, 1901 |
| | 73 | ♂ | Siskiyou Mts., Siskiyou Co., Calif. | Oct. 31, 1901 |
| ..... | ♂ ..... | Upper Lake, Lake Co., Calif. | Dec. 29, 1892 | |
| ..... | ♂ ad. | Nutchuk, Prince William Sd., Alaska | July 2, 1896 | |
| A. B. Howell | 36 | ♂ | Pasadena, Los Angeles Co., Calif. | Feb. 10, 1911 |
| | 751 | ♂ | Sierra City, Sierra Co., Calif. | Sept. 30, 1911 |
| | 1984 | ♀ | El Monte, Los Angeles Co., Calif. | Dec. 12, 1912 |
| | 4961 | ♂ | Sierra City, Sierra Co., Calif. | Oct. 19, 1911 |
| | 4964 | ♂ | Pasadena, Los Angeles Co., Calif. | Feb. 4, 1910 |
| | 4966 | ♀ | Pasadena, Los Angeles Co., Calif. | Nov. 20, 1910 |
| | 6568 | ♂ | Sierra City, Sierra Co., Calif. | Sept. 22, 1916 |
| | 6569 | ♂ | Sierra City, Sierra Co., Calif. | Oct. 1, 1916 |
| | 6570 | ♂ | Sierra City, Sierra Co., Calif. | Sept. 25, 1916 |
| S. G. Jewett | 134 | ..... | Salem, Marion Co., Ore. | April 23, 1912 |
| | 694 | ♀ | Portland, Ore. | Mar. 23, 1908 |
| | 695 | ♂ | Portland, Ore. | Mar. 23, 1908 |
| | 1045 | ♂ | Netarts, Tillamook Co., Ore. | Dec. 8, 1913 |
| | 1116 | ♂ | Netarts, Tillamook Co., Ore. | Jan. 6, 1913 |
| | 1490 | ♂ | Estacada, Clackamas Co., Ore. | Sept. 23, 1917 |
| | 1735 | ♂ | Mercer, Lane Co., Ore. | Feb. 4, 1918 |
| | 2173 | ♀ | Warm Spring, Crook Co., Ore. | April 30, 1915 |
| J. E. Law | 1189 | ♀ | Palo Alto, Santa Clara Co., Calif. | Dec. 10, 1898 |
| | 1190 | ♀ | Palo Alto, Santa Clara Co., Calif. | Dec. 10, 1898 |
| | 1022 | ♂ | Lankershim, Los Angeles Co., Calif. | Feb. 22, 1913 |
| | 1837 | ♀ | Santa Cruz Id., Calif. | April 27, 1911 |
| | 4514 | ♀ im. | Beverly Hills, Los Angeles Co., Calif. | Nov. 21, 1915 |
| | 5230 | ♂ ad. | Lankershim, Los Angeles Co., Calif. | Jan. 6, 1917 |
| J. & J. W. Mailliard | 2215 | ♀ | San Geronimo, Marin Co., Calif. | Dec. 9, 1896 |
| | 2695 | ♀ | San Geronimo, Marin Co., Calif. | Oct. 3, 1897 |
| | 2699 | ♂ | San Geronimo, Marin Co., Calif. | Oct. 10, 1897 |
| | 3815 | ♀ | San Geronimo, Marin Co., Calif. | Dec. 8, 1898 |
| | 4255 | ♀ | Eagle Lake, Lassen Co., Calif. | Oct. 24, 1899 |
| | 4256 | ♀ | Eagle Lake, Lassen Co., Calif. | Oct. 27, 1899 |
| | 6666 | ♀ | San Geronimo, Marin Co., Calif. | Dec. 9, 1905 |
| | 8301 | ♂ | Modesto, Stanislaus Co., Calif. | Nov. 30, 1915 |
| 8309 | ♀ | Modesto, Stanislaus Co., Calif. | Dec. 7, 1915 | |
| L. H. Miller | ..... | ♀ ..... | Forest Home, San Bernardino Co., Calif. | Nov. 21, 1918 |

PASSERELLA ILIACA SINUOSA—(Continued)

| Collection | No. | Sex Age | Locality | Date |
|------------------|-------|----------|---|---------------|
| L. H. Miller | ..... | ♂ ..... | Forest Home, San Bernardino Co., Calif. | Nov. 22, 1918 |
| G. F. Morcom | ..... | ♀ ..... | Mt. Wilson, Los Angeles Co., Calif. | Dec. 7, 1900 |
| J. R. Pemberton | 641 | ♂ | San Bruno, San Mateo Co., Calif. | Nov. 28, 1902 |
| | 679 | ♂ | San Bruno, San Mateo Co., Calif. | Feb. 28, 1903 |
| | 850 | ♂ | Carmel Valley, Monterey Co., Calif. | Dec. 20, 1903 |
| | 1361 | ♂ | Yucaipa, San Bernardino Co., Calif. | Jan. 7, 1917 |
| W. M. Pierce | 1812 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 |
| | 1816 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 |
| | 1818 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 |
| | 1828 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 |
| | 1820 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 |
|  | ..... | ♂ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 17, 1916 |
| | | 4♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 27, 1916 |
| | | 2♀ | | |
| | | 6♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 28, 1916 |
| | | 7♀ | | |
| | | 5♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1917 |
| | | 1♀ | | |
| | | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 2, 1917 |
| | | 2♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1917 |
| | 1736 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Nov. 27, 1918 |
| | 1741 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Nov. 28, 1918 |
| | 1742 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Nov. 28, 1918 |
| | 1745 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Nov. 28, 1918 |
| | 1748 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Nov. 28, 1918 |
| | 1735 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 1, 1918 |
| | 1737 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 1, 1918 |
| | 1740 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 1, 1918 |
| | 1743 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 1, 1918 |
| | 1746 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 8, 1918 |
| | 1720 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1721 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1727 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1731 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1734 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 |
| | 1755 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1919 |
| | 1756 | ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1919 |
| | 1757 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1919 |
| | 1760 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 11, 1919 |
| | 1761 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 11, 1919 |
| | 1764 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 11, 1919 |
| | 1774 | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 |
| | 1768 | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 |
| | 1769 | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 |
| | 1781 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 19, 1919 |
| | 1782 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 19, 1919 |
| | 1783 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 19, 1919 |
| | 1784 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 19, 1919 |
| | 1791 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 23, 1919 |
| | 1793 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 23, 1919 |
| | 1799 | ♂ | Santa Ana Cañon, Riverside Co., Calif. | Jan. 26, 1919 |
| | 1800 | ♀ | Santa Ana Cañon, Riverside Co., Calif. | Jan. 26, 1919 |
| | 1806 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 27, 1919 |
| | 638 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 14, 1915 |
| | 1292 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 7, 1916 |
| | 42 | ♀ | San Antonio Cañon, San Gabriel Mts., Calif. | Feb. 22, 1914 |
| | 1267 | ♂ | Upland, San Bernardino Co., Calif. | Dec. 31, 1915 |
| | 1270 | ..... | Upland, San Bernardino Co., Calif. | Dec. 31, 1915 |
| | 1263 | ♀ | Upland, San Bernardino Co., Calif. | Dec. 31, 1915 |
| C. H. Richardson | 1008 | ♂ | Pinto Mts., Kern Co., Calif. | Dec. 6, 1907 |

PASSERELLA ILIACA SINUOSA—(Concluded)

| Collection | No. | Sex Age | Locality | Date | |
|------------|-------------|---------|--|---|----------------|
| G. Willett | 384 | ♂ | Santa Cruz Id., Calif. | Nov. 28, 1907 | |
| | 385 | ♀ | Santa Cruz Id., Calif. | Nov. 27, 1907 | |
| | 1867 | ..... | Stony Ford, Colusa Co., Calif. | Jan. 17, 1917 | |
| | 1865 | ♂ | Stony Ford, Colusa Co., Calif. | Jan. 19, 1917 | |
| | 1866 | ♀ | Stony Ford, Colusa Co., Calif. | Jan. 22, 1917 | |
| | 1864 | ♂ | Stony Ford, Colusa Co., Calif. | Jan. 24, 1917 | |
| | 2118 | ♂ | Tejon Ranch, Kern Co., Calif. | Dec. 31, 1917 | |
| | 2041 | ♂ | Upland, San Bernardino Co., Calif. | Dec. 31, 1915 | |
| | L. E. Wyman | 904 | ♀ | Strawberry Valley, San Jacinto Mts., Calif. | Sept. 28, 1915 |
| | | 505 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Oct. 26, 1915 |
| 507 |  | ..... | Santa Monica Mts., Los Angeles Co., Calif. | Oct. 26, 1915 | |
| 1181 | | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 31, 1917 | |
| 1183 |  | ..... | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 31, 1917 | |
| 1186 | | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Feb. 11, 1917 | |
| 1163 | | ♀ | Newhall, Los Angeles Co., Calif. | Dec. 31, 1916 | |
| 1193 | | ♂ | Newhall, Los Angeles Co., Calif. | Mar. 4, 1917 | |

PASSERELLA ILIACA ANNECTENS

| Collection | No. | Sex Age | Locality | Date |
|------------------|-------|---------|---------------------------------------|----------------|
| Mus. Vert. Zool. | 6090 | ♂ | Pescadero, San Mateo Co., Calif. | Dec. 28, 1900 |
| | 6094 | ♀ | Pescadero, San Mateo Co., Calif. | Dec. 30, 1900 |
| | 6099 | ..... | Watsonville, Santa Cruz Co., Calif. | Oct. 7, 1903 |
| | 6100 | ..... | Berkeley, Alameda Co., Calif. | Dec. 28, 1892 |
| | 6310 | ..... | Berkeley, Alameda Co., Calif. | Feb. 15, 1902 |
| | 7196 | ♀ | Pt. Reyes, Marin Co., Calif. | Mar. 2, 1909 |
| | 7197 | ♀ | Pt. Reyes, Marin Co., Calif. | Mar. 2, 1909 |
| | 7198 | ♂ | Nicasio, Marin Co., Calif. | Feb. 21, 1909 |
| | 10077 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1897 |
| | 11288 | ♀ | Oakland, Alameda Co., Calif. | Nov. 9, 1889 |
| | 17231 | ♀ | Bolinas, Marin Co., Calif. | Mar. 30, 1911 |
| | 17232 | ♀ | Bolinas, Marin Co., Calif. | Mar. 31, 1911 |
| | 17233 | ♀ | Bolinas, Marin Co., Calif. | Mar. 31, 1911 |
| | 17352 | ♂ | Tower House, Shasta Co., Calif. | Mar. 8, 1911 |
| | 26447 | ♀ ad. | Berkeley, Alameda Co., Calif. | Jan. 5, 1916 |
| | 27367 | ♂ | Hume, Fresno Co., Calif. | Sept. 26, 1916 |
| | 29484 | ♀ ad. | Berkeley, Alameda Co., Calif. | Oct. 2, 1918 |
| | 29992 | ♀ ad. | San Carpojo Cr., S. L. O. Co., Calif. | Oct. 10, 1918 |
| | 29993 | ♀ im. | San Carpojo Cr., S. L. O. Co., Calif. | Oct. 10, 1918 |
| | 29994 | ♂ | San Lucas, Monterey Co., Calif. | Nov. 20, 1918 |
| | 29995 | ♂ im. | San Carpojo Cr., S. L. O. Co., Calif. | Oct. 12, 1918 |
| | 29996 | ♀ im. | Cambria, S. L. O. Co., Calif. | Oct. 29, 1918 |
| | 29997 | ♂ im. | Jolon, Monterey Co., Calif. | Oct. 18, 1918 |
| | 29998 | ♂ ad. | Jolon, Monterey Co., Calif. | Oct. 18, 1918 |
| | 29999 | ♀ ad. | Jolon, Monterey Co., Calif. | Oct. 18, 1918 |
| | 30000 | ♀ im. | Jolon, Monterey Co., Calif. | Oct. 18, 1918 |
| | 30416 | ♀ ad. | Seaside, Monterey Co., Calif. | Dec. 19, 1918 |
| | 30417 | ♀ im. | Seaside, Monterey Co., Calif. | Dec. 25, 1918 |
| | 30418 | ♀ | Seaside, Monterey Co., Calif. | Dec. 26, 1918 |
| | 30419 | ♀ im. | Seaside, Monterey Co., Calif. | Dec. 26, 1918 |
| | 30420 | ♂ im. | Seaside, Monterey Co., Calif. | Dec. 27, 1918 |
| | 30421 | ♀ im. | Seaside, Monterey Co., Calif. | Dec. 28, 1918 |
| | 30422 | ♀ ad. | Seaside, Monterey Co., Calif. | Dec. 28, 1918 |
| | 30423 | ♀ im. | Seaside, Monterey Co., Calif. | Dec. 28, 1918 |
| | 30424 | ♀ im. | Seaside, Monterey Co., Calif. | Dec. 30, 1918 |
| | 30425 | ♂ ad. | Monterey, Monterey Co., Calif. | Dec. 31, 1918 |
| | 30426 | ♀ | Monterey, Monterey Co., Calif. | Jan. 4, 1919 |

PASSERELLA ILIACA ANNECTENS—(Continued)

| Collection | No. | Sex Age | Locality | Date |
|-------------------|---------|---------|---|----------------|
| Mus. Vert. Zool. | 30427 | ♀ | Monterey, Monterey Co., Calif. | Jan. 6, 1919 |
| | 30428 | ♂ ad. | Seaside, Monterey Co., Calif. | Jan. 10, 1919 |
| American Museum | 88761 | ♂ | Palo Alto, Santa Clara Co., Calif. | Jan. 27, 1897 |
| Nat. Hist. | 88767 | ♀ | Palo Alto, Santa Clara Co., Calif. | Jan. 27, 1897 |
| | 88760 | ♂ | Palo Alto, Santa Clara Co., Calif. | Jan. 31, 1897 |
| | 88762 | ♀ | Palo Alto, Santa Clara Co., Calif. | Nov. 19, 1896 |
| | 88759 | ♂ | Palo Alto, Santa Clara Co., Calif. | Dec. 26, 1896 |
| | 47731 | ..... | Kalama, Cowlitz Co., Washington | Oct. 18, 1899 |
| | 26338 | ♂ | "Oregon & Cala" (from Woodward's Gardens, San Francisco) | ..... |
| | 84123 | ♂ | "Cal. D.S.B." (probably collected by D. S. Bryant in the San Francisco Bay region) | Nov. 26, 1875 |
| | 84120 | ♂ | Nicasio, Marin Co., Calif. | Feb. 10, 1880 |
| | 84121 | ♀ | Nicasio, Marin Co., Calif. | Mar. 3, 1880 |
| | 94635 | ♂ | Olema, Marin Co., Calif. | Nov. 25, 1904 |
| | 94636 | ♂ | Olema, Marin Co., Calif. | Nov. 27, 1904 |
| | 88766 | ♂ | Palo Alto, Santa Clara Co., Calif. | Jan. 11, 1897 |
| | 88763 | ♀ | Palo Alto, Santa Clara Co., Calif. | Jan. 7, 1897 |
| | 88765 | ♂ | Palo Alto, Santa Clara Co., Calif. | Jan. 13, 1897 |
| | 88768 | ♀ | Palo Alto, Santa Clara Co., Calif. | Jan. 21, 1897 |
| | 88764 | ♀ | Palo Alto, Santa Clara Co., Calif. | Jan. 25, 1897 |
| Calif. Acad. Sci. | 16752 | ♂ | Sebastopol, Sonoma Co., Calif. | Sept. 25, 1884 |
|  | ..... | ♂ ..... | San Mateo Co., Calif. | Jan. 19, 1913 |
| Carnegie Museum | 15368 | ♂ | Beaverton, Washington Co., Ore. | Feb. 25, 1890 |
| Pittsburgh | 15369 | ♀ | Beaverton, Washington Co., Ore. | Feb. 25, 1890 |
| | 15370 | ♂ | Beaverton, Washington Co., Ore. | Feb. 27, 1890 |
| | 15371 | ♂ | Beaverton, Washington Co., Ore. | Feb. 27, 1890 |
| | 15373 | ♂ | Beaverton, Washington Co., Ore. | Mar. 25, 1890 |
| | 15375 | ♀ | Beaverton, Washington Co., Ore. | April 9, 1890 |
| | 15376 | ♂ | Beaverton, Washington Co., Ore. | April 15, 1890 |
| | 15377 | ♂ | Beaverton, Washington Co., Ore. | April 22, 1890 |
| | 15363 | ..... | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 |
| | 15364 | ..... | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 |
| | 29696 | ♂ | Nicasio, Marin Co., Calif. | Mar. 9, 1883 |
| Field Museum | 14380 | ♂ | Monterey, Monterey Co., Calif. | April 6, 1903 |
| Nat. Hist. | 17056 | ♂ | [Nicasio?], Marin Co., Calif. | Nov. 11, 1881 |
| | 5002 | ♂ | Nicasio, Marin Co., Calif. | Feb. 16, 1889 |
| | 48896 | ♂ | Los Gatos, Santa Clara Co., Calif. | Jan. 26, 1895 |
| | 48892 | ♂ | San Bruno, San Mateo Co., Calif. | Dec. 28, 1901 |
| Kansas University | 954 | ♂ | Monterey, Monterey Co., Calif. | Nov. 1, 1903 |
| | 955 | ♂ | Monterey, Monterey Co., Calif. | Nov. 1, 1903 |
| | 956 | ♀ | Monterey, Monterey Co., Calif. | Nov. 1, 1903 |
| Provincial Mus. | 964 | ♀ | Victoria, B.C. | Oct. 19, 1896 |
| Victoria, B.C. | 966 | ♂ | Victoria, B.C. | Jan. 28, 1896 |
| U. S. Biol. Surv. | 164968 | ♀ ad. | Yakutat Bay (north shore), Alaska | June 20, 1899 |
| | 164969 | ♂ ad. | Yakutat Bay, Alaska | June 20, 1899 |
| | 164971 | ♂ ad. | Yakutat, Alaska | June 20, 1899 |
| | 164970 | ♂ ad. | Yakutat Bay, Alaska | June 22, 1899 |
| | 164966 | ♂ ad. | Yakutat Bay, Alaska | June 23, 1899 |
| | 138240 | ♀ ad. | Yakutat, Alaska | July 4, 1895 |
| | 138242 | ♂ ad. | Yakutat, Alaska | July 5, 1895 |
| | 138243 | ♂ ad. | Yakutat, Alaska | July 8, 1895 |
| | 138244 | ♀ ad. | Yakutat, Alaska | July 10, 1895 |
| U. S. Nat. Mus. | 170222* | ♂ ad. | Yakutat, Alaska | June 20, 1899 |
| | 170223 | ♂ ad. | Yakutat, Alaska | June 20, 1899 |
| | 170224 | ♀ ad. | Yakutat, Alaska | June 20, 1899 |
| | 170225 | ♂ ad. | Yakutat, Alaska | June 21, 1899 |
| | 170226 | ♂ ad. | Yakutat, Alaska | June 19, 1899 |
| | 170227 | ♂ juv. | Yakutat, Alaska | June 20, 1899 |

*Type.

PASSERELLA ILLIACA ANNECTENS—(Continued)

| Collection | No. | Sex Age | Locality | Date | |
|--|---------------|--|--|-----------------------------------|---------------|
| Victoria Memorial Museum | 4181 | ♀ | Clayoquot, Vancouver Id., B.C. | Sept. 17, 1907 | |
| | 5723 | ♂ | Nicasio, Marin Co., Calif. | April 20, 1900 | |
| D. R. Dickey W. O. Emerson | 6096 | ♂ | Nicasio, Marin Co., Calif. | Feb. 19, 1908 | |
| | C 294 | ♂ | Fortuna, Humboldt Co., Calif. | Sept. 20, 1915 | |
| | 819 | ♀ | Haywards, Alameda Co., Calif. | Jan. 9, 1890 | |
| | 821 | ♀ | Haywards, Alameda Co., Calif. | Jan. 27, 1890 | |
| | 1053 | ♀ | Pacific Grove, Monterey Co., Calif. | Oct. 3, 1896 | |
| | 1133 | ♂ | Pacific Grove, Monterey Co., Calif. | Oct. 23, 1896 | |
| | 1199 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 16, 1896 | |
| | 1238 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 30, 1896 | |
| | 1947 | ♀ | Haywards, Alameda Co., Calif. | Oct. 30, 1898 | |
| | 1948 | ♂ | Haywards, Alameda Co., Calif. | Oct. 30, 1898 | |
| | 1974 | ♀ | Haywards, Alameda Co., Calif. | Nov. 16, 1898 | |
| | 1998 | ♂ | Haywards, Alameda Co., Calif. | Dec. 4, 1898 | |
| | 2024 | ♀ | Haywards, Alameda Co., Calif. | Dec. 4, 1898 | |
| | 1999 | ♀ | Haywards, Alameda Co., Calif. | Dec. 29, 1898 | |
| | 3698 | ♂ | Haywards, Alameda Co., Calif. | Dec. 6, 1903 | |
| | 3893 | ♀ | Haywards, Alameda Co., Calif. | Jan. 15, 1906 | |
| | 4584 | ♀ | Haywards, Alameda Co., Calif. | April 19, 1908 | |
| | J. H. Fleming | 12628 | ♀ | San Bruno, San Mateo Co., Calif. | Dec. 26, 1901 |
| | | 12629 | ♀ | San Bruno, San Mateo Co., Calif. | Dec. 28, 1901 |
| | | 12630 | ♂ | San Bruno, San Mateo Co., Calif. | Dec. 26, 1901 |
| 12631 | | ♀ | San Bruno, San Mateo Co., Calif. | Feb. 21, 1903 | |
| 12632 | | ♀ | Baden, San Mateo Co., Calif. | Dec. 26, 1901 | |
| 12633 | | ♂ | Big Sur River, Monterey Co., Calif. | Dec. 27, 1903 | |
| 12634 | | ♂ | Big Sur River, Monterey Co., Calif. | Dec. 27, 1903 | |
| 12635 | | ♀ | Big Sur River, Monterey Co., Calif. | Dec. 27, 1903 | |
| 18109 | | ♂ | Logan, Clackamas Co., Ore. | Mar. 18, 1899 | |
| J. Grinnell | | 141 | ♂ | Pasadena, Los Angeles Co., Calif. | Nov. 9, 1894 |
| | 1674 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 | |
| | 1827 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 12, 1896 | |
| | 4434 | ♂ im. | Palo Alto, Santa Clara Co., Calif. | Oct. 27, 1900 | |
| | 4435 | ♀ im. | Palo Alto, Santa Clara Co., Calif. | Oct. 27, 1900 | |
| | 4450 | ♂ im. | Palo Alto, Santa Clara Co., Calif. | Nov. 4, 1900 | |
| | 4451 | ♂ im. | Pescadero Creek, Santa Cruz Mts., Calif. | Nov. 24, 1900 | |
| | 4565 | ♂ | Palo Alto, Santa Clara Co., Calif. | Jan. 19, 1901 | |
| | 4914 | ♀ ad. | Palo Alto, Santa Clara Co., Calif. | Oct. 20, 1901 | |
| | 4969 | ♂ im. | Palo Alto, Santa Clara Co., Calif. | Nov. 30, 1901 | |
| | 4981 | ♂ | Palo Alto, Santa Clara Co., Calif. | Dec. 20, 1901 | |
| | 5019 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 27, 1901 | |
| | 5020 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 27, 1901 | |
| | 5056 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 30, 1901 | |
| | 5057 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 30, 1901 | |
| | 5058 | ♀ | Pacific Grove, Monterey Co., Calif. | Dec. 30, 1901 | |
| | 7465 | ♂ im. | Arroyo Seco Cañon, Los Angeles Co., Calif. | Dec. 23, 1905 | |
| 7466 | ♂ im. | Arroyo Seco Cañon, Los Angeles Co., Calif. | Dec. 23, 1905 | | |
| A. B. Howell J. E. Law J. & J. W. Mailiard | ..... | ♂ ..... | San Geronimo, Marin Co., Calif. | Jan. 10, 1902 | |
| | 1065 | ♂ | Tacoma, Pierce Co., Washington | Nov. 10, 1909 | |
| | 1184 | ♀ | Palo Alto, Santa Clara Co., Calif. | Dec. 9, 1898 | |
| | 1456 | ♂ | San Geronimo, Marin Co., Calif. | Dec. 3, 1895 | |
| | 1843 | ♂ | San Geronimo, Marin Co., Calif. | Mar. 30, 1896 | |
| | 2190 | ♀ | San Geronimo, Marin Co., Calif. | Nov. 15, 1896 | |
| | 2193 | ♀ | San Geronimo, Marin Co., Calif. | Nov. 20, 1896 | |
| | 2197 | ♀ | San Geronimo, Marin Co., Calif. | Nov. 25, 1896 | |
| | 2216 | ♀ | San Geronimo, Marin Co., Calif. | Dec. 9, 1896 | |
| | 2705 | ♀ | San Geronimo, Marin Co., Calif. | Oct. 11, 1897 | |
| | 2919 | ♀ | San Geronimo, Marin Co., Calif. | Jan. 7, 1898 | |
| | 3780 | ♂ | San Geronimo, Marin Co., Calif. | Nov. 15, 1898 | |
| | 3889 | ♂ | Fulton, Sonoma Co., Calif. | Jan. 24, 1899 | |
| | 4623 | ♂ | San Geronimo, Marin Co., Calif. | Jan. 16, 1901 | |

PASSERELLA ILIACA ANNECTENS—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|-------|---------|--|---------------|
| J. & J. W. Mailliard | 7257 | ♀ | San Geronimo, Marin Co., Calif. | Jan. 20, 1879 |
| | 8730 | ♀ | San Geronimo, Marin Co., Calif. | Feb. 3, 1916 |
| | 8731 | ♂ | San Geronimo, Marin Co., Calif. | Jan. 25, 1916 |
| | 8732 | ♀ | San Geronimo, Marin Co., Calif. | Dec. 23, 1915 |
| | 8733 | ♂ | San Geronimo, Marin Co., Calif. | Jan. 5, 1916 |
| | 8734 | ♂ | San Geronimo, Marin Co., Calif. | Jan. 5, 1916 |
| L. H. Miller | ..... | ♂ ..... | Berkeley, Alameda Co., Calif. | Nov. 22, 1903 |
|  | ..... | ♀ ..... | Berkeley, Alameda Co., Calif. | Nov. 22, 1903 |
| J. R. Pemberton | 869 | ♂ | Big Sur River, Monterey Co., Calif. | Dec. 22, 1903 |
| | 972 | ♀ | Baden, San Mateo Co., Calif. | Dec. 6, 1903 |
| W. M. Pierce | 1268 | ♀ | Upland, San Bernardino Co., Calif. | Dec. 31, 1915 |
| | 1312 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 14, 1916 |
| | 157 | ..... | Mt. Wilson, Los Angeles Co., Calif. | Nov. 27, 1903 |
| A. Wetmore | 2250 | ♂ im. | Stockton, San Joaquin Co., Calif. | Nov. 28, 1906 |
| H. S. Swarth | 38 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Nov. 4, 1894 |
| | 1687 | ♂ | Arroyo Seco, Los Angeles Co., Calif. | Oct. 22, 1900 |

PASSERELLA ILIACA TOWNSENDI

| Collection | No. | Sex Age | Locality | Date |
|------------------|---------|-----------|-------------------------|----------------|
| Mus. Vert. Zool. | 485-499 | 13♂ ad. | Admiralty Id., Alaska | April 25 to |
| | | 2♀ ad. | | June 12, 1908 |
| | 457 | ♀ ad. | Chichagof Id., Alaska | June 25, 1908 |
| | 458 | ♂ ad. | Chichagof Id., Alaska | June 23, 1908 |
| | 459 | ♂ ad. | Chichagof Id., Alaska | June 25, 1908 |
| | 460 | ♀ ad. | Chichagof Id., Alaska | June 25, 1908 |
| | 520 | ♀ ad. | Chichagof Id., Alaska | June 25, 1908 |
| | 521 | ♂ juv. | Chichagof Id., Alaska | June 24, 1908 |
| | 522 | ♂ ad. | Chichagof Id., Alaska | June 24, 1908 |
| | 523 | ♂ juv. | Chichagof Id., Alaska | July 29, 1908 |
| | 501 | ♂ ad. | Baranof Id., Alaska | June 16, 1908 |
| | 502 | ♂ ad. | Baranof Id., Alaska | June 16, 1908 |
| | 503 | ♀ ad. | Baranof Id., Alaska | June 17, 1908 |
| | 504 | ♂ ad. | Baranof Id., Alaska | June 17, 1908 |
| | 505 | ♂ ad. | Baranof Id., Alaska | June 17, 1908 |
| | 440 | ♂ im. | Baranof Id., Alaska | Aug. 23, 1908 |
| | 450 | ♀ im. | Helm Bay, Alaska | Sept. 15, 1908 |
| | 510 | ♂ juv. | Glacier Bay, Alaska | July 5, 1908 |
| | 511 | ♀ juv. | Glacier Bay, Alaska | July 14, 1908 |
| | 24424 | ad. | Forrester Id., Alaska | May 25, 1913 |
| | 24425 | ad. | Forrester Id., Alaska | May 25, 1913 |
| | 24426 | ad. | Forrester Id., Alaska | June 6, 1913 |
| | 9656 | ♂ im. | Port Snettisham, Alaska | Aug. 24, 1909 |
| | 9657 | ♂ juv. | Port Snettisham, Alaska | Aug. 25, 1909 |
| | 9658 | ♂ juv. | Port Snettisham, Alaska | Aug. 25, 1909 |
| | 9659 | ♂ im. | Port Snettisham, Alaska | Aug. 26, 1909 |
| | 9660 | ♀ im. | Port Snettisham, Alaska | Aug. 26, 1909 |
| | 9661 | ♂ juv. | Port Snettisham, Alaska | Aug. 26, 1909 |
| | 9662 | ♀ im. | Port Snettisham, Alaska | Aug. 27, 1909 |
| | 9663 | ♂ im. | Port Snettisham, Alaska | Aug. 28, 1909 |
| | 9664 | ♂ juv. | Port Snettisham, Alaska | Aug. 29, 1909 |
| | 9665 | ♂ im. | Port Snettisham, Alaska | Aug. 29, 1909 |
| | 9666 | ♀ im. | Port Snettisham, Alaska | Aug. 29, 1909 |
| | 9667 | ♀ im. | Port Snettisham, Alaska | Aug. 29, 1909 |
| | 9668 | ♀ im. | Port Snettisham, Alaska | Aug. 29, 1909 |
| | 9669 | ♂ im. | Taku River, Alaska | Sept. 7, 1909 |
| | 9670 | ♀ im. | Taku River, Alaska | Sept. 7, 1909 |

PASSERELLA ILIACA TOWNSENDI—(Continued)

| Collection | No. | Sex Age | Locality | Date | |
|-----------------------------------|-------------------------------|-----------|--|--|----------------|
| Mus. Vert. Zool. | 9671 | ♂ im. | Taku River, Alaska | Sept. 19, 1909 | |
| | 9672 | ♂ im. | Taku River, Alaska | Sept. 19, 1909 | |
| | 16248 | ♀ ad. | Parksville, Vancouver Id., B.C. | April 26, 1910 | |
| | 16249 | ♀ ad. | Parksville, Vancouver Id., B.C. | April 28, 1910 | |
| | 16250 | ♂ im. | Errington, Vancouver Id., B.C. | Sept. 24, 1910 | |
| | 11290 | ♂ | Oakland, Alameda Co., Calif. | Nov. 27, 1891 | |
| | 11292 | ♂ | Berkeley, Alameda Co., Calif. | Nov. 14, 1891 | |
| | 29483 | ♂ im. | Berkeley, Alameda Co., Calif. | Oct. 2, 1918 | |
| | 16869 | ♂ im. | Cuddeback, Humboldt Co., Calif. | Sept. 29, 1910 | |
| | 16870 | ♀ im. | Trinidad, Humboldt Co., Calif. | Oct. 12, 1910 | |
| | 27150 | ♂ | Fields Landing, Humboldt Co., Calif. | Dec. 2, 1916 | |
| | 27151 | ♂ | Little River Beach, Humboldt Co., Calif. | Dec. 5, 1916 | |
| | American Museum Nat. Hist. | 67882 | ♂ | Sitka, Alaska | Sept. 10, 1896 |
| | | 47730 | | Duncans, Vancouver Id., B.C. | |
| | | 47733 | | Cape Disappointment, Washington | Oct. 28, 1889 |
| 47734 | | ♀ | Cape Disappointment, Washington | Nov. 6, 1889 | |
| 47732 | | ♂ | Cape Disappointment, Washington | Nov. 9, 1889 | |
| 138974 | | ♂ | Neah Bay, Washington | Nov. 1, 1914 | |
| 94637 | | ♂ | Olema, Marin Co., Calif. | Nov. 27, 1904 | |
| 94638 | | ♀ | Olema, Marin Co., Calif. | Nov. 27, 1904 | |
| Carnegie Museum, Pittsburgh | | 15372 | ♂ | Beaverton, Washington Co., Ore. | Mar. 10, 1890 |
| | | 15374 | ♂ | Beavertou, Washington Co., Ore. | Mar. 31, 1890 |
| Provincial Mus. Victoria, B.C. | | 902 | ♂ | Victoria, B.C. | Oct. 27, 1896 |
| | 908 | ♂ | Victoria, B.C. | Nov. 12, 1896 | |
| U. S. Biol. Surv. | 969 | ♀ | Masset, Queen Charlotte Ids., B.C. | June 18, 1910 | |
| | 166833 | ♂ juv. | Cumshewa Inlet, Queen Charlotte Ids., B.C. | June 13, 1900 | |
| | 166834 | ♀ juv. | Cumshewa Inlet, Queen Charlotte Ids., B.C. | June 14, 1900 | |
| | 166835 | ♂ ad. | Cumshewa Inlet, Queen Charlotte Ids., B.C. | June 15, 1900 | |
| | 166836 | ♀ ad. | Cumshewa Inlet, Queen Charlotte Ids., B.C. | June 23, 1900 | |
| | 166837 | ♂ ad. | Cumshewa Inlet, Queen Charlotte Ids., B.C. | June 23, 1900 | |
| | 166838 | ♂ ad. | Cumshewa Inlet, Queen Charlotte Ids., B.C. | June 23, 1900 | |
| | 166839 | ♀ ad. | Cumshewa Inlet, Queen Charlotte Ids., B.C. | June 26, 1900 | |
| | 166840 | ♂ juv. | Skidegate, Queen Charlotte Ids., B.C. | July 10, 1900 | |
| | 166841 | ♀ ad. | Skidegate, Queen Charlotte Ids., B.C. | July 17, 1900 | |
| | 166842 | ♂ juv. | Skidegate, Queen Charlotte Ids., B.C. | July 17, 1900 | |
| | U. S. Nat. Mus. | 2874* | ♀ | "Columbia River, Ore." | Feb. 15, 1836 |
| | | 46018 | juv. | "Sitka, Russian America" | |
| | | 46019 | ♂ ad. | "Sitka, Russian America" |1866 |
| | | 81389 | ♂ ad. | George Id., Port Althorp (Chichagof Id.) Alaska | June 19, 1880 |
| 160673 | | ♂ ad. | Howkau, Long Id, Alaska | Mar. 29, 1897 | |
| 160671 | | ♀ ad. | Howkan, Long Id., Alaska | April 6, 1897 | |
| 160675 | | ♂ ad. | Howkan, Long Id, Alaska | April 27, 1897 | |
| 170221 | | ♀ ad. | Wrangell, s.e. Alaska | June 5, 1899 | |
| Victoria Memorial Museum | 4185 | ♀ | Clayoquot, Vancouver Id., B.C. | Sept 19, 1907 | |
|  | ..... | ..... ad. | Masset, Queen Charlotte Ids., B.C. | July, 1910 | |
| A. Brooks | ..... | ♀ ad. | Rose Spit, Queen Charlotte Ids., B.C. | July, 1910 | |
|  | ..... | ..... ad. | Graham Id., Queen Charlotte Ids., B.C. | April, 1914 | |
|  | ..... | ♂ ad. | North Id., Queen Charlotte Ids., B.C. | April 16, 1914 | |
| | | | | | |
| D. R. Dickey | 21 | ♀ | Eureka, Humboldt Co., Calif. | Mar. 3, 1912 | |
| | C 292 | ♂ | Fortuna, Humboldt Co., Calif. | Sept 19, 1915 | |
| | C 300 | ♂ | Fortuna, Humboldt Co., Calif. | Sept. 22, 1915 | |
| | C 301 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 22, 1915 | |
| | C 310 | ♂ | Fortuna, Humboldt Co., Calif. | Sept. 23, 1915 | |
| | C 325 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 26, 1915 | |
| | C 332 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 26, 1915 | |
| | C 345 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 28, 1915 | |
| | C 363 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 29, 1915 | |
| | C 380 | ♂ | Cuddeback, Humboldt Co., Calif. | Oct. 2, 1915 | |

PASSERELLA ILIACA TOWNSENDI—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|-------|---------|--|----------------|
| D. R. Dickey | C 381 | ♂ | Cuddeback, Humboldt Co., Calif. | Oct. 2, 1915 |
| | C 384 | ♀ | Cuddeback, Humboldt Co., Calif. | Oct. 2, 1915 |
| | C 398 | ♀ | Cuddeback, Humboldt Co., Calif. | Oct. 3, 1915 |
| W. O. Emerson | 600 | ♀ | Haywards, Alameda Co., Calif. | Dec. 8, 1885 |
| | 2432 | ♀ | Haywards, Alameda Co., Calif. | Sept. 20, 1900 |
| | 3888 | ♀ | Haywards, Alameda Co., Calif. | Dec. 16, 1905 |
| | 4253 | ♂ | Haywards, Alameda Co., Calif. | Oct. 3, 1906 |
| | 4349 | ♂ | Camp Meeker, Sonoma Co., Calif. | Oct. 27, 1906 |
| J. Grinnell | ..... | ♀ ..... | Upper Pescadero Cr., Santa Cruz Mts., Calif. | Nov. 29, 1900 |
|  | ..... | ♂ ..... | San Geronimo, Marin Co., Calif. | Oct. 16, 1898 |
| A. B. Howell | 4957 | ♀ | Netarts, Tillamook Co., Ore. | Jan. 3, 1913 |
| | 4960 | ♂ | Netarts, Tillamook Co., Ore. | Jan. 3, 1913 |
| | 4958 | ♂ | Netarts, Tillamook Co., Ore. | Jan. 6, 1913 |
| | 4959 | ♀ | Netarts, Tillamook Co., Ore. | Jan. 6, 1913 |
| S. G. Jewett | 530 | ♂ | Portland, Ore. | Mar. 16, 1905 |
| | 606 | ♀ | Netarts, Tillamook Co., Ore. | Dec. 27, 1912 |
| | 1208 | ♂ | Mercer, Lane Co., Ore. | Nov. 12, 1913 |
| | 1549 | ♂ | Grant's Pass, Josephine Co., Ore. | May 15, 1917 |
| J. E. Law | 4650 | ♂ | Eureka, Humboldt Co., Calif. | Nov. 12, 1915 |
| | 4651 | ♂ | Eureka, Humboldt Co., Calif. | Jan. 29, 1916 |
| | 4652 | ♀ | Eureka, Humboldt Co., Calif. | Jan. 19, 1916 |
| | 3178 | ♂ | Pinery Cañon, Chiricahua Mts., Arizona | Nov. 28, 1914 |
| J. & J. W. Mailliard | J 915 | ♂ | Eureka, Humboldt Co., Calif. | Jan. 13, 1917 |
| W. M. Pierce | 2225 | ♂ | Netarts, Tillamook Co., Ore. | Jan. 3, 1913 |
| | 356 | ♂ | Netarts, Tillamook Co., Ore. | Jan. 3, 1913 |
| | 355 | ♀ | Netarts, Tillamook Co., Ore. | Jan. 6, 1913 |

PASSERELLA ILIACA FULIGINOSA

| Collection | No. | Sex Age | Locality | Date |
|------------------------------------|---------|----------|---|----------------|
| Mus. Vert. Zool | 16251 | ♂ juv. | 18 mi. s. Albern, Vancouver Id., B.C. | July 13, 1910 |
| | 16252 | ♂ juv. | 18 mi. s. Albern, Vancouver Id., B.C. | July 13, 1910 |
| | 16253 | ♀ im. | Nootka Sound, Vancouver Id., B.C. | Aug. 4, 1910 |
| | 16254 | ♂ juv. | Nootka Sound, Vancouver Id., B.C. | Aug. 10, 1910 |
| | 27152 | ♂ | Blue Lake, Humboldt Co., Calif. | Dec. 4, 1916 |
| | 27153 | ♂ | San Antonio Cañon, Sao Gabriel Mts., Calif. | Nov. 30, 1916 |
| | 28946 | ♀ ad. | Lake Merced, San Francisco Co., Calif. | Dec. 23, 1917 |
| | 29479 | ♀ ad. | Berkeley, Alameda Co., Calif. | Oct. 2, 1918 |
| | 29480 | ♀ im. | Berkeley, Alameda Co., Calif. | Oct. 2, 1918 |
| | 29481 | ♂ im. | Berkeley, Alameda Co., Calif. | Oct. 2, 1918 |
| | 29482 | ♀ im. | Berkeley, Alameda Co., Calif. | Oct. 2, 1918 |
| | 29486 | ♂ im. | Berkeley, Alameda Co., Calif. | Oct. 18, 1918 |
| | 29487 | ♀ im. | Berkeley, Alameda Co., Calif. | Oct. 18, 1918 |
| | 29488 | ♂ im. | Berkeley, Alameda Co., Calif. | Oct. 18, 1918 |
| | 29545 | ♂ im. | Berkeley, Alameda Co., Calif. | Nov. 2, 1918 |
| | 29566 | ♀ im. | Berkeley, Alameda Co., Calif. | Nov. 2, 1918 |
| | 29991 | ♀ im. | Morro, San Luis Obispo Co., Calif. | Sept. 26, 1918 |
| | 30663 | ♀ | Berkeley, Alameda Co., Calif. | Dec. 24, 1918 |
| | 30664 | ♂ im. | Berkeley, Alameda Co., Calif. | Dec. 24, 1918 |
| | 30665 | ad. | Berkeley, Alameda Co., Calif. | Dec. 24, 1918 |
| Calif. Acad. Sci. | 18721 | ♀ | S. E. Farallon Id., Calif. | May 31, 1911 |
| Provincial Mus., Victoria, B.C. | 3831 | ..... | Victoria, B.C. |1915 |
| | 3834 | ♀ | Victoria, B.C. | Jan. 18, 1916 |
| | 3836 | ..... | Victoria, B.C. | Jan. 30, 1914 |
| | 3837 | ♀ | Victoria, B.C. | Jan. 11, 1916 |
| U. S. Biol. Surv. | 157611* | ♂ ad. | Neah Bay, Wash. | June 10, 1897 |

*Type.

PASSERELLA ILIACA FULIGINOSA—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|--------|-----------|---|-----------------|
| U. S. Nat. Mus. | 115745 | ♂ ad. | Victoria, B.C. | "May" |
| | 149955 | ad. | Smith's Id., Washington | Mar., 1895 |
| Victoria Mem. Museum | 4179 | ♂ | Clayoquot, Vancouver Id., B.C. | Sept. 17, 1907 |
| | 4180 | ♂ | Clayoquot, Vancouver Id., B.C. | Sept. 17, 1907 |
| | 4186 | ♀ | Clayoquot, Vancouver Id., B.C. | Sept. 19, 1907 |
| | 4191 | ♀ | Clayoquot, Vancouver Id., B.C. | Oct. 2, 1907 |
| | 8910 | ..... | Uchucklesit Harbor, Vancouver Id., B.C. | Jan. 1, 1916 |
| D. R. Dickey | C 305 | ♀ | Fortuna, Humboldt Co., Calif. | Sept. 22, 1915 |
| | C 344 | ♂ | Fortuna, Humboldt Co., Calif. | Sept. 28, 1915 |
| | C 383 | ♂ | Cuddeback, Humboldt Co., Calif. | Oct. 2, 1915 |
| S. G. Jewett | 1550 | ♀ | Marshfield, Coos Co., Ore. | Nov. 26, 1917 |
| J. & J. W. Mailliard | X3893 | ♀ | Blue Lake, Humboldt Co., Calif. | Dec. 4, 1916 |
| | X3896 | ♀ | Puyallup, Pierce Co., Wash. | Feb. 6, 1904 |

PASSERELLA ILIACA SCHISTACEA

| Collection | No. | Sex Age | Locality | Date |
|---------------------------|------------|-----------|--|----------------|
| Mus. Vert. Zool. | 9044-9058, | 12♂ ad. | Pine Forest Mts., Humboldt Co., Nev. | May 17 to |
| | 9063 | 4♀ ad. | | July 11, 1909 |
| | 9059-9062, | 4♂ | Pine Forest Mts., Humboldt Co., Nev. | July 7 to |
| | 9064-9068 | 5♀ juv. | | Aug. 3, 1909 |
| | 557 | ♂ | Anthony, Baker Co., Ore. | Oct. 11, 1907 |
| | 2008 | ad. | San Jacinto Mts., Calif. | July 3, 1908 |
| | 20543 | ♂ im. | Cottonwood Lakes, Inyo Co., Calif. | Sept. 3, 1911 |
| | 22602 | ♀ ad. | Lone Pine, Inyo Co., Calif. | April 10, 1912 |
| | 22603 | ♂ ad. | Lone Pine, Inyo Co., Calif. | April 10, 1912 |
| | 22604 | ♀ ad. | Lone Pine, Inyo Co., Calif. | April 13, 1912 |
| | 22605 | ♀ ad. | Lone Pine, Inyo Co., Calif. | April 16, 1912 |
| | 23203 | ♂ im. | Blue Cañon, Placer Co., Calif. | Aug. 31, 1912 |
| | 24296 | ♀ im. | Cisco, Placer Co., Calif. | Sept. 28, 1913 |
| | 24297 | ♂ im. | Cisco, Placer Co., Calif. | Sept. 28, 1913 |
| | 26040 | ♂ im. | Gem Lake, Mono Co., Calif. | Sept. 13, 1915 |
| | 26041 | ♀ im. | Warren Fork, Mono Co., Calif. | Sept. 24, 1915 |
| | 26042 | ♀ im. | Aspen Valley, Yosemite Park, Calif. | Oct. 14, 1915 |
| | 26308 | ♂ | Varain, Mariposa Co., Calif. | Nov. 29, 1915 |
| | 28444 | ♀ im. | Benton, Mono Co., Calif. | Sept. 18, 1917 |
| | 27373 | ♀ ad. | Kings River Cañon, Fresno Co., Calif. | Sept. 12, 1916 |
| | 27374 | ♂ im. | Kings River Cañon, Fresno Co., Calif. | Sept. 15, 1916 |
| | 27375 | ♂ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 22, 1916 |
| | 27376 | ♂ im. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 23, 1916 |
| | 27377 | ♂ im. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 23, 1916 |
| | 27378 | ♀ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 23, 1916 |
| | 27380 | ♀ | Horse Corral Mdw., Fresno Co., Calif. | Sept. 21, 1916 |
| Am. Mus. Nat. Hist. | 41628 | ♂ ad. | "Fort Bridger (Camp Scott), Utah." | ..... |
| | 52996 | ♂ | Payson, Yavapai [=Gila] Co., Ariz. | Feb. 18, 1888 |
| | 100358 | ♂ ad. | Ptarmigan Lake (near Laggan), Alberta | July 11, 1907 |
| Carnegie Mus., Pittsburgh | 15380 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 |
| | 15378 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 |
| | 36144 | ♂ juv. | Malheur Co., Ore. | July 12, 1910 |
| | 54168 | ♀ | Klamath Falls, Ore. | Sept. 16, 1916 |
| Field Mus. Nat. Hist. | 39600 | ♂ ad. | Pullman, Whitman Co., Wash. | May 27, 1909 |
| Mus. Hist. Sci. Art | 2153 | ♂ ad. | San Antonio Cañon, Los Angeles Co., Calif. | Oct. 19, 1917 |
| U. S. Nat. Mus. | 5718* | ♀ ad. | "Platte River, K.T." | July 19, 1856 |
| | 11234 | ♂ ad. | "Fort Bridger, Utah, (Camp Scott.)" | April 9, 1858 |
| | 11231 | ♂ ad. | "Fort Bridger, Utah, (Camp Scott.)" | April 14, 1858 |

*Type.

PASSERELLA ILIACA SCHISTACEA—(Concluded)

| Collection | No. | Sex Age | Locality | Date | |
|--------------------|------------------|---------|---|--|----------------|
| * U. S. Nat. Mus. | 11239 | ♂ ad. | "Fort Bridger, Utah, (Camp Scott.)" | May 21, 1858 | |
| | 11238 | ♂ ad. | "Fort Bridger, Utah, (Camp Scott.)" | May 21, 1858 | |
| | 11236 | ♂ ad. | "Fort Bridger, Utah, (Camp Scott.)" | June 2, 1858 | |
| | 11229 | ♀ ad. | Fort Bridger, Wyo. | May 6, 1858 | |
| | 13331 | ♀ juv. | Lookout Mountain, Utah | July 4, 1859 | |
| Victoria Mem. Mus. | 1175 | ♂ ad. | Banff, Alberta | May 16, 1891 | |
| | 1176 | ♂ ad. | Banff, Alberta | May 16, 1891 | |
| | 1240 | ♂ ad. | Banff, Alberta | June 1, 1891 | |
| | 1263 | ♀ ad. | Banff, Alberta | June 11, 1891 | |
| | 1264 | ♂ ad. | Banff, Alberta | June 12, 1891 | |
| | | ♀ ad. | "Cascade Mts., B.C." | July 21, 1891 | |
| A. Brooks | ..... | ♀ ad. | "Cascade Mts., B.C." | July 21, 1891 | |
| D. R. Dickey | A 103 | ♀ | Ojai Valley, Ventura Co., Calif. | April 25, 1913 | |
| | C 700 | ..... | Nordhoff, Ventura Co., Calif. | Dec. 22, 1915 | |
| | E 12 | ♀ | Dehesa, San Diego Co., Calif. | Feb. 19, 1917 | |
| J. H. Fleming | 7757 | ♂ | Dulzura, San Diego Co., Calif. | Feb. 2, 1891 | |
| A. B. Howell | 22 | ♂ | Tujunga, Los Angeles Co., Calif. | Jan. 2, 1911 | |
| | 4945 | ♂ | Seven Oaks, San Bernardino Mts., Calif. | Sept. 25, 1910 | |
| | 4946 | ♂ | Bluff Lake, San Bernardino Mts., Calif. | Sept. 23, 1914 | |
| | 4947 | ..... | Clarke's Ranch, San Bernardino Mts., Calif. | Sept. 23, 1914 | |
| | 4556 | ♀ | Sierra City, Sierra Co., Calif. | Sept. 22, 1916 | |
| | 4560 | ♀ | Sierra City, Sierra Co., Calif. | Sept. 22, 1916 | |
| | S. G. Jewett | 1019 | ♀ | Anderson Valley, Harney Co., Ore. | Sept. 14, 1913 |
| | J. E. Law | 3179 | ♀ | Bonita Cañon, Chiricahua Mts., Ariz. | Jan. 24, 1915 |
| | | 2328 | ♀ im. | Camp Baldy, San Bernardino Co., Calif. | Oct. 1, 1914 |
| | | 4452 | ♀ ad. | Bouquet Cañon, Los Angeles Co., Calif. | Oct. 9, 1915 |
| L. H. Miller | ..... | ♂ ..... | Bouquet Cañon, Los Angeles Co., Calif. | Oct. 8, 1915 | |
| G. F. Morecom | ..... | ♂ ..... | Camp Harney, Harney Co., Ore. | April 2, 1876 | |
| W. M. Pierce | 310 | ♀ | Lytle Creek, San Bernardino Co., Calif. | Sept. 2, 1914 | |
| | 311 | ♀ | Lytle Creek, San Bernardino Co., Calif. | Sept. 5, 1914 | |
| | 854 | ..... | Lytle Creek, San Bernardino Co., Calif. | Sept. 3, 1914 | |
| | 1262 | ♀ | San Bernardino, San Bernardino Co., Calif. | Dec. 27, 1915 | |
| | 1826 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 | |
| | 1822 | ..... | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 2, 1919 | |
|  | ..... | ♀ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 2, 1917 | |
|  | ..... | ♀ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1917 | |
| | 1794 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 23, 1919 | |
| | C. H. Richardson | 1009 | ♂ | Piute Mts., Kern Co., Calif. | Dec. 5, 1907 |
| G. Willett | 1803 | ♂ | Sierra Ancha, Ariz. | Nov. 7, 1916 | |
| | 1804 | ♀ | Sierra Ancha, Ariz. | Nov. 12, 1916 | |

PASSERELLA ILIACA FULVA

| Collection | No. | Sex Age | Locality | Date |
|-------------------|--------|----------|---|---------------|
| Mus. Vert. Zool. | 14795* | ♂ ad. | Sugar Hill, Modoc Co., Calif. | May 19, 1910 |
| | 14796- | 6♂ ad. | Sugar Hill, Modoc Co., Calif. | May 19 to |
| | 14803 | 2♀ ad. | | June 2, 1910 |
| | 14804- | 23♂ ad. | Warner Mts., Modoc Co., Calif. | June 2 to 1 |
| | 14859 | 14♀ ad. | | Aug. 9, 1910 |
| | | 9♂ juv. | | |
| | | 10♀ juv. | | |
| U. S. Biol. Surv. | 165342 | ♀ ad. | Hayden Hill, Lassen Co., Calif. | July 16, 1899 |
| | 139694 | ♀ ad. | Warner Mts., Ore. | Aug. 2, 1896 |
| | 139689 | ♂ ad. | Plush, Lake Co., Ore. | June 30, 1896 |
| | 139690 | ♂ ad. | Plush, Lake Co., Ore. | June 27, 1896 |
| | 139691 | ♂ ad. | 20 mi. s.e. Prineville, Crook Co., Ore. | June 29, 1896 |
| A. Brooks | ..... | ♀ ..... | Sierra City, Sierra County, Calif. | Oct. 6, 1911 |

*Type.

PASSERELLA ILIACA FULVA—(Concluded)

| Collection | No. | Sex Age | Locality | Date | |
|---------------|----------------------|---------|---|---|---------------|
| W. L. Dawson | ..... | ♂ ad. | Sugar Hill, Modoc Co., Calif. | June 13, 1912 | |
|  | ..... | ♂ ad. | Warner Mts., Modoc Co., Calif. | July 8, 1912 | |
|  | ..... | ♂ | "Santa Barbara Co., Cal." | Jan. 11, 1913 | |
| D. R. Dickey | E 301 | ♂ im. | "Lawson Creek," Modoc Co., Calif. | Aug. 23, 1917 | |
| W. O. Emerson | ..... | ♂ | Volcan Mts., San Diego Co., Calif. | Feb. 9, 1884 | |
| J. H. Fleming | 7758 | ♂ ad. | "Southern Oregon" | April 11, 1883 | |
| A. B. Howell | 6827 | ♀ | Bluff Lake, San Bernardino Mts., Calif. | Oct. 11, 1918 | |
| S. G. Jewett | 1036 | ♀ ad. | Sisters, Crook Co., Ore. | July 23, 1914 | |
| | 1293 | ♂ ad. | Warm Spring, Crook Co., Ore. | May 4, 1915 | |
| | 1394 | ♂ ad. | Lakeview, Lake Co., Ore. | May 20, 1917 | |
| | 1395 | ♀ ad. | Lakeview, Lake Co., Ore. | May 20, 1917 | |
| | 1477 | ♂ ad. | Burns, Harney Co., Ore. | June 24, 1917 | |
| | 1723 | ♂ ad. | Adel, Lake Co., Ore. | May 11, 1918 | |
| | 1724 | ♂ ad. | Adel, Lake Co., Ore. | May 11, 1918 | |
| | 1725 | ♂ ad. | Fort Klamath, Klamath Co., Ore. | May 9, 1918 | |
| | J. & J. W. Mailliard | 4253 | ♀ | Eagle Lake, Lassen Co., Calif. | Oct. 1, 1899 |
| | W. M. Pierce | 1772 | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 |
| | | 1796 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 23, 1919 |

PASSERELLA ILIACA MEGARHYNCHUS

| Collection | No. | Sex Age | Locality | Date | |
|--------------------------------|---------------------------------|---------|--|--|---------------|
| Mus. Vert. Zool. | 10070 | ♀ | Arroyo Seco (Near Pasadena), Los Angeles Co., Calif. | Sept. 15, 1895 | |
| | 10073 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 8, 1896 | |
| | 10075 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 8, 1896 | |
| | 12023 | ♀ | Arroyo Seco (near Pasadena), Los Angeles Co., Calif. | Dec. 22, 1905 | |
| | 17353 | ♀ | Tower House, Shasta Co., Calif. | Mar. 2, 1911 | |
| | 17354 | ♀ | Tower House, Shasta Co., Calif. | Mar. 7, 1911 | |
| | 17355 | ♀ | Tower House, Shasta Co., Calif. | Mar. 7, 1911 | |
| | 23281 | ♀ im. | Blue Cañon, Placer Co., Calif. | Oct. 19, 1912 | |
| | 25156 | ♀ ad. | El Portal, Mariposa Co., Calif. | Nov. 28, 1914 | |
| | 30446 | ♀ im. | Seaside, Monterey Co., Calif. | Dec. 30, 1918 | |
| | American Mus. | 138829 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 6, 1896 |
| | Nat. Hist. Calif. Acad. Sci. | 11436 | ♂ | Lakeport, Lake Co., Calif. | Feb. 27, 1908 |
| 17895 | | ♂ | Sisson, Siskiyou Co., Calif. | Sept. 5, 1910 | |
| 34576 | | ♂ | Sherman, Los Angeles Co., Calif. | Dec. 25, 1906 | |
| Carnegie Museum, Pittsburgh | 15381 | ♂ | San Diego, Calif. | Oct. 7, 1890 | |
| | 15382 | ♂ | San Diego, Calif. | Nov. 11, 1890 | |
| | 15380 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Nov. 4, 1894 | |
| | 29697 | ♀ | Nicasio, Marin Co., Calif. | Jan. 30, 1901 | |
| | Mus. Hist., Sci. Art | 1605 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 7, 1916 |
| 2342 | | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 30, 1918 | |
| 2343 | | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 30, 1918 | |
| U. S. Nat. Mus. | 12402* | ♀ | Fort Tejon, Kern Co., Calif. | ..... |  |

*Type.

PASSERELLA ILIACA MEGARHYNCHUS—(Continued)

| Collection | No. | Sex Age | Locality | Date | |
|---------------|---------------|---------|---|--|---------------|
| L. B. Bishop | 30573 | ♂ | Hollywood, Los Angeles Co., Calif. | Jan. 2, 1918 | |
| | 30574 | ♂ | Hollywood, Los Angeles Co., Calif. | Jan. 2, 1918 | |
| | 30621 | ♀ | Hollywood, Los Angeles Co., Calif. | Jan. 19, 1918 | |
| | 30634 | ♀ | Hollywood, Los Angeles Co., Calif. | Jan. 29, 1918 | |
| | 30661 | ♀ | Hollywood, Los Angeles Co., Calif. | Feb. 11, 1918 | |
| | 30692 | ♂ | Hollywood, Los Angeles Co., Calif. | Feb. 16, 1918 | |
| | 30693 | ♂ | Hollywood, Los Angeles Co., Calif. | Feb. 16, 1918 | |
| A. Brooks | ..... | ♀ ..... | Santa Barbara, Calif. | Dec. 9, 1912 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Jan. 17, 1913 | |
| F. S. Daggett | 882 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Nov. 4, 1894 | |
| | 3188 | ♂ | Switzer's Camp, Los Angeles Co., Calif. | Oct. 24, 1896 | |
| | 3195 | ♀ | Switzer's Camp, Los Angeles Co., Calif. | Oct. 21, 1896 | |
| | 4865 | ♀ | Pasadena, Los Angeles Co., Calif. | Jan. 16, 1897 | |
| | 4866 | ♀ | Pasadena, Los Angeles Co., Calif. | Jan. 16, 1897 | |
| | 4870 | ♀ | Pasadena, Los Angeles Co., Calif. | Jan. 16, 1897 | |
| | 4871 | ♂ | Pasadena, Los Angeles Co., Calif. | Jan. 16, 1897 | |
| | 8093 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 2, 1915 | |
| | 8094 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 2, 1915 | |
| | 8095 | ..... | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 2, 1915 | |
| | W. L. Dawson | | ♂ | "Santa Barbara Co.," Calif. | Nov. 10, 1913 |
| | | | ♀ | "Santa Barbara Co.," Calif. | Nov. 10, 1913 |
| ..... |  | ♀ ..... | "Santa Barbara Co.," Calif. | Nov. 22, 1913 | |
| ..... |  | ♀ ..... | Santa Barbara, Santa Barbara Co., Calif. | Jan. 31, 1914 | |
| D. R. Dickey | A 102 | ♂ | Ojai Valley, Ventura Co., Calif. | April 25, 1913 | |
| | A 119 | ♂ | Ojai Valley, Ventura Co., Calif. | April 27, 1913 | |
| | C 658 | ♂ | Nordhoff, Ventura Co., Calif. | Dec. 16, 1915 | |
| | C 696 | ♂ | Nordhoff, Ventura Co., Calif. | Dec. 22, 1915 | |
| | C 698 | ..... | Nordhoff, Ventura Co., Calif. | Dec. 22, 1915 | |
| | C 245 | ♂ | Nordhoff, Ventura Co., Calif. | Dec. 22, 1915 | |
| | C 247 | ♂ | Nordhoff, Ventura Co., Calif. | Dec. 22, 1915 | |
| | C 249 | ♀ | Nordhoff, Ventura Co., Calif. | Dec. 22, 1915 | |
| | J. H. Fleming | 5224 | ♀ | Los Angeles, Los Angeles Co., Calif. | Jan. 1, 1899 |
| J. Grinnell | 470 | ♂ | Pasadena, Los Angeles Co., Calif. | Oct. 26, 1895 | |
| | 633 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Feb. 1, 1896 | |
| | 1672 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 31, 1896 | |
| | 2364 | ♀ | Pasadena, Los Angeles Co., Calif. | April 17, 1897 | |
| | 3328 | ♂ | Santa Catalina Id., Calif. | Dec. 27, 1897 | |
| | 4119 | ♀ | Pasadena, Los Angeles Co., Calif. | Feb. 5, 1900 | |
| | 6123 | ♀ im. | Arroyo Seco Cañon, Los Angeles Co., Calif. | Nov. 12, 1904 | |
| | 6826 | ♀ | Bluff Lake, San Bernardino Mts., Calif. | Oct. 11, 1918 | |
| | J. E. Law | 1425 | ♂ | Hollywood, Los Angeles Co., Calif. | Feb. 22, 1912 |
| | G. F. Morecom | 4210 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 6, 1903 |
| | | 641 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 15, 1915 |
| | W. M. Pierce | 643 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 15, 1915 |
| | | 1298 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 8, 1916 |
| 1299 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 8, 1916 | |
| 1300 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 8, 1916 | |
| 1305 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Feb. 13, 1916 | |
| ..... |  | ♂ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1917 | |
| ..... |  | ♂ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 2, 1917 | |
| 1817 | | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 | |
| 1739 | | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Nov. 29, 1918 | |
| 1724 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 | |
| 1725 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 | |
| 1726 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 | |
| 1729 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 | |
| 1730 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 | |
| 1753 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1919 | |
| 1754 | | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 5, 1919 | |
| 1773 | | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 | |

PASSERELLA ILIACA MEOARHYNCHUS—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|------------------|------|---------|---|----------------|
| W. M. Pierce | 1777 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 16, 1919 |
| | 1778 | ♀ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 16, 1919 |
| | 1779 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 19, 1919 |
| | 1780 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 19, 1919 |
| | 1792 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 23, 1919 |
| | 1804 | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 25, 1919 |
| | 1805 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 25, 1919 |
| | 1801 | ♂ | Santa Ana Cañon (near Corona) Riverside Co., Calif. | Jan. 26, 1919 |
| C. H. Richardson | 1807 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 27, 1919 |
| | 1073 | ♂ | Sierra Madre, Los Angeles Co., Calif. | Jan. 5, 1908 |
| | 1085 | ♀ | Arroyo Seco Cañon, Los Angeles Co., Calif. | Jan. 14, 1908 |
| H. S. Swarth | 767 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 8, 1897 |
| | 769 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 6, 1897 |
| | 770 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 8, 1897 |
| | 1021 | ♀ | Los Angeles, Calif. | Jan. 1, 1899 |
| | 1750 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 7, 1900 |
| | 3270 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 23, 1902 |
| | 4208 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 6, 1903 |
| G. Willett | 382 | ♀ | Santa Cruz Id., Calif. | Nov. 24, 1907 |
| L. E. Wyman | 841 | ♀ | San Antonio Cañon, San Gabriel Mts., Calif. | Sept. 28, 1914 |
| | 504 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Oct. 26, 1915 |
| | 491 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Oct. 31, 1915 |

PASSERELLA ILIACA REEVICAUDA

| Collection | No. | Sex Age | Locality | Date | |
|---|-------------------------------|------------|--|--|----------------|
| Mus. Vert. Zool. | 23920 | juv. | S. Yolla Bolly Mt., Tehama Co., Calif. | July 31, 1913 | |
| | 23921 | ♀ ad. | S. Yolla Bolly Mt., Tehama Co., Calif. | July 31, 1913 | |
| | 23922 | ♂ ad. | S. Yolla Bolly Mt., Tehama Co., Calif. | Aug. 1, 1913 | |
| | 23923 | ♀ ad. | S. Yolla Bolly Mt., Tehama Co., Calif. | Aug. 2, 1913 | |
| | 23924* | ♀ ad. | S. Yolla Bolly Mt., Trinity Co., Calif. | Aug. 7, 1913 | |
| | 23925 | ♂ juv. | Mt. Sanhedrin, Mendocino Co., Calif. | Aug. 23, 1913 | |
| | 10071 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 8, 1896 | |
| | 10072 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 8, 1896 | |
| | 10074 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 8, 1896 | |
| | American Museum Nat. Hist. | 88819 | ♂ ad. | Snow Mountain, Colusa Co., Calif. | June 19, 1896 |
| | | 88820 | ♀ ad. | Snow Mountain, Colusa Co., Calif. | June 19, 1896 |
| | | 88821 | ♀ ad. | Snow Mountain, Colusa Co., Calif. | June 19, 1896 |
| | | 88814 | ♂ ad. | Snow Mountain, Colusa Co., Calif. | June 21, 1896 |
| | | 88815 | ♂ ad. | Snow Mountain, Colusa Co., Calif. | June 21, 1896 |
| 88816 | | ♂ ad. | Snow Mountain, Colusa Co., Calif. | June 21, 1896 | |
| 88817 | | ♂ ad. | Snow Mountain, Colusa Co., Calif. | June 21, 1896 | |
| 88818 | | ♂ ad. | Snow Mountain, Colusa Co., Calif. | June 21, 1896 | |
| 88822 | | ♀ ad. | Snow Mountain, Colusa Co., Calif. | June 21, 1896 | |
| 84124 | | ♀ | Nicasio, Marin Co., Calif. | April 29, 1880 | |
| Calif. Acad. Sci. Carnegie Museum, Pittsburgh | 34565 | ♂ | Sherman, Los Angeles Co., Calif. | Oct. 4, 1906 | |
| | 29698 | ♂ ad. | Nicasio, Marin Co., Calif. | "June 28, 1892" | |
| | 29699 | ♂ | San Geronimo, Marin Co., Calif. | Feb. 13, 1899 | |
| | Field Mus. Nat. Hist. | 26021 | ♂ | Nicasio, Marin Co., Calif. | Jan. 30, 1901 |
| | | 196789 | ♂ ad. | S. Yolla Bolly Mt., Tehama Co., Calif. | July 28, 1905 |
| | U. S. Biol. Surv. | 138253 | ♂ ad. | Santa Catalina Id., Calif. | April 19, 1892 |
| | | 138256 | ♀ ad. | Santa Catalina Id., Calif. | April 21, 1892 |
| 30660 | | ♀ | Hollywood, Los Angeles Co., Calif. | Feb. 11, 1918 | |
| L. B. Bishop | 30687 | ♀ | Hollywood, Los Angeles Co., Calif. | Feb. 15, 1918 | |
| | 30622 | ♂ | Hollywood, Los Angeles Co., Calif. | Jan. 19, 1918 | |
|  | ..... | ♀ ..... | Santa Barbara, Calif. | Feb. 17, 1911 | |
| A. Brooks | ..... | ♂ ..... | Santa Barbara, Calif. | Dec. 9, 1912 | |

*Type.

PASSERELLA ILIACA BREVICAUDA—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|---------------------|--------|-----------|--|----------------|
| F. S. Daggett | 8092 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 2, 1915 |
| W. L. Dawson | ..... | ♀ ..... | Santa Barbara, Calif. | Dec. 9, 1912 |
| ..... | ..... | ♀ ..... | "Santa Barbara Co.," Calif. | Jan. 1, 1913 |
| ..... | ..... | ♂ ..... | "Santa Barbara Co.," Calif. | Nov. 22, 1913 |
| ..... | ..... | ♀ ..... | "Santa Barbara Co.," Calif. | Dec. 1, 1913 |
| D. R. Dickey | A 58 | ♂ ? | Ojai Valley, Ventura Co., Calif. | April 18, 1913 |
| J. H. Fleming | 18105 | ♀ | Nicasio, Marin Co., Calif. | Jan. 30, 1901 |
| J. Grinnell | 3286 | ♀ | Santa Catalina Id., Calif. | Dec. 24, 1897 |
| ..... | 3290 | ♀ | Santa Catalina Id., Calif. | Dec. 25, 1897 |
| ..... | 3329 | ♀ | Santa Catalina Id., Calif. | Dec. 27, 1897 |
| A. B. Howell | 57 | ♂ | Santa Catalina Id., Calif. | April 8, 1911 |
| ..... | ..... | ..... | Little Pine, Santa Barbara Co., Calif. | Aug. 30, 1910 |
| J. & J. W. Mailiard | 7259 | ♀ | San Geronimo, Marin Co., Calif. | Feb. 5, 1880 |
| ..... | Ex.747 | ♀ | San Geronimo, Marin Co., Calif. | Jan. 20, 1897 |
| ..... | 2677 | ♀ | San Geronimo, Marin Co., Calif. | Sept. 23, 1897 |
| ..... | 2678 | ♀ | San Geronimo, Marin Co., Calif. | Sept. 23, 1897 |
| ..... | 2891 | ♀ | San Geronimo, Marin Co., Calif. | Dec. 20, 1897 |
| ..... | 2892 | ♀ | San Geronimo, Marin Co., Calif. | Dec. 20, 1897 |
| ..... | 3922 | ♀ | San Geronimo, Marin Co., Calif. | Feb. 4, 1899 |
| ..... | 3923 | ♀ | San Geronimo, Marin Co., Calif. | Feb. 4, 1899 |
| ..... | 3924 | ♀ | San Geronimo, Marin Co., Calif. | Feb. 4, 1899 |
| ..... | 7378 | ♀ | San Geronimo, Marin Co., Calif. | Jan. 21, 1913 |
| G. F. Murcom | ..... | ♂ ..... | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 8, 1896 |
| ..... | ..... | ♂ ..... | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 6, 1896 |
| ..... | ..... | ♂ ..... | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 6, 1896 |
| ..... | ..... | ♂ ..... | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 6, 1897 |
| H. S. Swarth | 2060 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 31, 1895 |
| ..... | 198 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 6, 1896 |
| ..... | 199 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Jan. 6, 1896 |
| ..... | 768 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Dec. 15, 1897 |
| L. E. Wyman | 488 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Oct. 26, 1915 |
| ..... | 495 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 2, 1915 |

PASSERELLA ILIACA CANESCENS

| Collection | No. | Sex Age | Locality | Date |
|-----------------------|--------|------------|--|---------------|
| Mus. Vert. Zool. | 28431 | ♀ juv. | Big Prospector Mdw., White Mts., Calif. | July 27, 1917 |
| ..... | 28432 | ♂ juv. | Big Prospector Mdw., White Mts., Calif. | July 27, 1917 |
| ..... | 28433 | juv. | Big Prospector Mdw., White Mts., Calif. | July 27, 1917 |
| ..... | 28434 | ♂ ad. | Big Prospector Mdw., White Mts., Calif. | July 27, 1917 |
| ..... | 28435 | ♀ ad. | Big Prospector Mdw., White Mts., Calif. | July 27, 1917 |
| ..... | 28436 | ♂ juv. | McCloud Camp, White Mts., Calif. | Aug. 1, 1917 |
| ..... | 28437 | ♂ ad. | McCloud Camp, White Mts., Calif. | Aug. 1, 1917 |
| ..... | 28438 | ♂ ad. | McCloud Camp, White Mts., Calif. | Aug. 3, 1917 |
| ..... | 28439* | ♂ im. | Roberts Ranch, White Mts., Calif. | Aug. 15, 1917 |
| ..... | 28440 | ♀ juv. | Wyman Creek, White Mts., Calif. | Aug. 16, 1917 |
| ..... | 28441 | ♀ ad. | Roberts Ranch, White Mts., Calif. | Aug. 16, 1917 |
| ..... | 28442 | ♂ ad. | Wyman Creek, White Mts., Calif. | Aug. 17, 1917 |
| ..... | 28443 | ♀ juv. | Roberts Ranch, White Mts., Calif. | Aug. 18, 1917 |
| ..... | 27605 | ♀ | Blythe, Riverside Co., Calif. | Oct. 25, 1916 |
| Mus. Hist. Sci. & Art | 2153 | ♂ | San Antonio Cañon, Los Angeles Co., Calif. | Oct. 19, 1917 |
| A. Brookes | ..... | ♂ ..... | Santa Barbara, Calif. | Dec. 9, 1912 |
| ..... | ..... | ..... | Santa Barbara, Calif. | Jan. 11, 1913 |
| W. M. Pierce | ..... | ..... | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 27, 1916 |
| ..... | ..... | ♂ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 27, 1916 |
| ..... | ..... | ♀ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 28, 1916 |
| ..... | ..... | ♂ ..... | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 2, 1917 |
| ..... | 1815 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Feb. 1, 1919 |
| H. S. Swarth | 39 | ♀ | Mt. Wilson, Los Angeles Co., Calif. | Nov. 4, 1894 |

*Type.

PASSERELLA ILIACA MONOENSIS

| Collection | No. | Sex Age | Locality | Date | |
|------------------|-------------------|---------|---|---|----------------|
| Mus. Vert. Zool. | 26928 | ♀ ad. | Walker Lake, Mono Co., Calif. | May 9, 1916 | |
| | 26929 | ♀ ad. | Parker Creek, Mono Co., Calif. | May 12, 1916 | |
| | 26930* | ♂ ad. | Mono Lake P.O., Mono Co., Calif. | May 21, 1916 | |
| | 26931 | ♂ ad. | Mono Lake P.O., Mono Co., Calif. | May 22, 1916 | |
| | 26932 | ♂ ad. | Walker Lake, Mono Co., Calif. | June 24, 1916 | |
| | 26933 | ♂ ad. | Mono Lake P.O., Mono Co., Calif. | June 30, 1916 | |
| | 26934 | ♂ ad. | Mono Lake P.O., Mono Co., Calif. | July 8, 1916 | |
| | 26035 | ♀ ad. | Parker Creek, Mono Co., Calif. | Sept. 10, 1915 | |
| | 26036 | ♀ | Walker Lake, Mono Co., Calif. | Sept. 11, 1915 | |
| | 26037 | ♂ ad. | Tuolumne River, Yosemite Park, Calif. | Oct. 1, 1915 | |
| | 27379 | ♂ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 23, 1916 | |
| | 27381 | ♀ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 19, 1916 | |
| | 27382 | ♂ | Horse Corral Mdw., Fresno Co., Calif. | Sept. 22, 1916 | |
| | 27383 | ♂ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 19, 1916 | |
| | 28430 | ♂ ad. | Panamint Mts., Inyo Co., Calif. | June 25, 1917 | |
| | 30631 | ♂ | Coulterville, Mariposa Co., Calif. | Dec. 25, 1918 | |
| | 30647 | ♂ | Coulterville, Mariposa Co., Calif. | Jan. 20, 1919 | |
| | 30648 | ♂ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | 30649 | ♂ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | 30650 | ♂ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | 30651 | ♂ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | 30652 | ♀ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | 30653 | ♀ | Coulterville, Mariposa Co., Calif. | Jan. 27, 1919 | |
| | Calif. Acad. Sci. | 15345 | ♂ ad. | Rough Creek, Mono Co., Calif. | May 22, 1904 |
| | J. H. Fleming | 18106 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Jan. 23, 1900 |
| | J. Grinnell | 7464 | ♂ | Arroyo Seco Cañon, Los Angeles Co., Calif. | Dec. 23, 1905 |
| | A. B. Howell | 3534 | ♀ | Pasadena, Los Angeles Co., Calif. | Jan. 12, 1915 |
| | | 4943 | ♀ | Santa Catalina Id., Calif. | Feb. 15, 1910 |
| | | 3645 | ♀ | San Clemente Id., Calif. | Mar. 28, 1915 |
| | J. E. Law | 2318 | ♀ ad. | San Antonio Cañon, San Bernardino Co., Calif. | Sept. 24, 1914 |
| | W. M. Pierce | | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 28, 1916 |
| | | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 28, 1916 |
| | | 1738 | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Dec. 8, 1918 |
| 1723 | | ♂ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 | |
| 1732 | | ♀ | San Dimas Cañon, Los Angeles Co., Calif. | Jan. 1, 1919 | |
| 1771 | | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 | |
| 1775 | | ♀ | Cucamonga Cañon, San Bernardino Co., Calif. | Jan. 12, 1919 | |
| H. S. Swarth | | 322 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Oct. 19, 1896 |

*Type.

PASSERELLA ILIACA MARIPOSAE

| Collection | No. | Sex Age | Locality | Date |
|------------------|--------|--------------------------------------|--|----------------------------------|
| Mus. Vert. Zool. | 22589- | 6♂ ad. | Little Onion Valley, Inyo Co., Calif. | May 27 to |
| | 22596 | 2♀ ad. | | May 30, 1912 |
| | 22597- | 4♂ ad. | | Kearsarge Pass, Inyo Co., Calif. | June 5 to |
| | 22601 | 1♀ ad. | June 15, 1912 | |
| | 25691 | ♀ ad. | Yosemite Pt., Yosemite Park, Calif. | June 4, 1915 |
| | 25692- | 5♂ ad. | Chinquapin, Yosemite Park, Calif. | June 4 to |
| | 25698* | 1♀ ad. | | June 13, 1915 |
| | | 1♀ juv. | | |
| | 25699 | ♂ ad. | Merced Grove, Mariposa Co., Calif. | June 14, 1915 |
| | 25700 | ♀ ad. | Crane Flat, Mariposa Co., Calif. | June 15, 1915 |
| | 25701 | ♀ ad. | e. fork Indian Cañon, Mariposa Co., Calif. | June 20, 1915 |
| | 25702 | ♀ ad. | e. fork Indian Cañon, Mariposa Co., Calif. | June 23, 1915 |
| | 26032 | ♂ ad. | Washburn Lake, Yosemite Park, Calif. | Aug. 24, 1915 |
| 26033 | ♀ juv. | Washburn Lake, Yosemite Park, Calif. | Aug. 24, 1915 | |

*25693, Type.

PASSERELLA ILIACA MARIPOSAE—(Continued)

| Collection | No. | Sex Age | Locality | Date | |
|------------------|-------------------------------|-----------|---|-----------------------------|---------------|
| Mus. Vert. Zool. | 26034 | ♀ im. | Washburn Lake, Yosemite Park, Calif. | Aug. 28, 1915 | |
| | 26038 | ♂ ad. | Tuolumne River, Yosemite Park, Calif. | Oct. 1, 1915 | |
| | 21261 | ♂ juv. | Tuolumne Meadows, Tuolumne Co., Calif. | Aug., 1911 | |
| | 23189- | 4♂ ad. | Blue Cañon, Placer Co., Calif. | Aug. 27 to | |
| | 23202 | 1♀ ad. | | Sept. 1, 1912 | |
| | | 5♂ im. | | | |
| | | 3♀ im. | | | |
| | | 1♀ juv. | | | |
| | 23278 | ♂ ad. | Blue Cañon, Placer Co., Calif. | Oct. 14, 1912 | |
| | 23279 | ♀ im. | Blue Cañon, Placer Co., Calif. | Oct. 14, 1912 | |
| | 23280 | ♀ im. | Blue Cañon, Placer Co., Calif. | Oct. 19, 1912 | |
| | 24275 | ♂ ad. | Blue Cañon, Placer Co., Calif. | Sept. 25, 1913 | |
| | 24276- | 2♂ ad. | Cisco, Placer Co., Calif. | Sept. 25 to | |
| | 24295 | 10♂ im. | | Oct. 8, 1913 | |
| | | 8♀ im. | | | |
| | 4127 | ♂ ad. | Cisco, Placer Co., Calif. | April 28, 1870 | |
| | 6089 | ♂ ad. | Cisco, Placer Co., Calif. | June 15, 1902 | |
| | 27057 | ♂ juv. | Michigan Bluff, Placer Co., Calif. | Aug. 10, 1916 | |
| | 17142 | ♀ juv. | Independence Lake, Nevada Co., Calif. | Aug. 8, 1910 | |
| | 17143 | juv. | Independence Lake, Nevada Co., Calif. | Aug. 9, 1910 | |
| | 17144 | ♀ juv. | Independence Lake, Nevada Co., Calif. | Aug. 9, 1910 | |
| | 17145 | ♀ juv. | Fallen Leaf Lake, Eldorado Co., Calif. | Aug. 15, 1910 | |
| | 17146 | ♂ ad. | Independence Lake, Nevada Co., Calif. | July 14, 1910 | |
| | 17147 | ♂ ad. | Independence Lake, Nevada Co., Calif. | July 17, 1910 | |
| | 17148 | ♀ juv. | Independence Lake, Nevada Co., Calif. | July 24, 1910 | |
| | 17149 | ♂ juv. | Independence Lake, Nevada Co., Calif. | July 31, 1910 | |
| | 17150 | ♂ juv. | Little Truckee River, Sierra Co., Calif. | Aug. 6, 1910 | |
| | 17151 | ♂ juv. | Independence Lake, Nevada Co., Calif. | Aug. 9, 1910 | |
| | 17152 | ♀ juv. | Fallen Leaf Lake, Eldorado Co., Calif. | Aug. 15, 1910 | |
| | 17153 | juv. | Glen Alpine, Eldorado Co., Calif. | Aug. 16, 1910 | |
| | 27056 | ♀ juv. | Fyffe, Eldorado Co., Calif. | July 24, 1916 | |
| | 5157 | ♂ juv. | Mt. Shasta, Siskiyou Co., Calif. | July 25, 1904 | |
| | 19284 | ♀ juv. | Castle Lake, Siskiyou Co., Calif. | Aug. 21, 1911 | |
| | 19285 | juv. | Castle Lake, Siskiyou Co., Calif. | Aug. 19, 1911 | |
| | 29086 | ♂ ad. | Trinity Mts., Shasta Co., Calif. | May 14, 1918 | |
| | 29087 | ♂ ad. | Sisson, Siskiyou Co., Calif. | May 15, 1918 | |
| | 29088 | ♂ ad. | Sisson, Siskiyou Co., Calif. | May 15, 1918 | |
| | 29089 | ♂ ad. | Sisson, Siskiyou Co., Calif. | May 15, 1918 | |
| | 29090 | ♀ ad. | Little Shasta River, Siskiyou Co., Calif. | May 15, 1918 | |
| | 27384 | ♂ im. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 20, 1916 | |
| | 27385 | ♂ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 22, 1916 | |
| | 30646 | ♂ | Coulterville, Mariposa Co., Calif. | Jan. 20, 1919 | |
| | American Museum Nat. Hist. | 88769 | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 10, 1897 |
| | | 88776 | ♀ ad. | Fyffe, Eldorado Co., Calif. | June 15, 1897 |
| | | 88771 | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 18, 1897 |
| | | 88772 | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 18, 1897 |
| | | 88773 | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 18, 1897 |
| 88774 | | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 18, 1897 | |
| 88775 | | ♀ ad. | Fyffe, Eldorado Co., Calif. | June 18, 1897 | |
| 88777 | | ♀ juv. | Fyffe, Eldorado Co., Calif. | June 18, 1897 | |
| 88770 | | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 22, 1897 | |
| 88792 | | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | June 15, 1898 | |
| 88795 | | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | June 17, 1898 | |
| 88800 | | ♀ ad. | Mt. Tallac, Eldorado Co., Calif. | June 17, 1898 | |
| 88794 | | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | June 22, 1898 | |
| 88793 | | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | June 26, 1898 | |
| 88797 | | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | June 28, 1898 | |
| 88796 | | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | June 30, 1898 | |
| 88801 | | ♀ ad. | Mt. Tallac, Eldorado Co., Calif. | July 4, 1898 | |
| 88802 | | ♂ juv. | Mt. Tallac, Eldorado Co., Calif. | July 4, 1898 | |

PASSERELLA ILIACA MARIPOSAE—(Continued)

| Collection | No. | Sex Age | Locality | Date |
|-------------------------------|--------------------|-----------|-------------------------------------|-----------------|
| American Museum Nat. Hist. | 88803 | ♀ juv. | Mt. Tallac, Eldorado Co., Calif. | July 4, 1898 |
| | 88798 | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | July 4, 1898 |
| | 88799 ^f | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. | July, 1898 |
| | 88804 | ♂ ad. | Mt. Tallac, Eldorado Co., Calif. |1898 |
| | 88780 | ♀ ad. | Echo, Eldorado Co., Calif. | July 1, 1897 |
| | 88781 | ♀ ad. | Echo, Eldorado Co., Calif. | July 14, 1897 |
| | 88779 | ♂ ad. | Echo, Eldorado Co., Calif. | July 27, 1896 |
| | 88778 | ♂ ad. | Echo, Eldorado Co., Calif. | Aug. 12, 1896 |
| | 88782 | ..... | Echo, Eldorado Co., Calif. | Sept. 1, 1896 |
| | 88783 | ♂ | Echo, Eldorado Co., Calif. | Sept. 1, 1896 |
| | 88784 | ♂ | Echo, Eldorado Co., Calif. | Sept. 23, 1896 |
| | 88785 | ♀ | Echo, Eldorado Co., Calif. | Oct. 2, 1896 |
| | 88805 | ♂ ad. | Pyramid Peak, Eldorado Co., Calif. | June 23, 1898 |
| | 88806 | ♂ ad. | Pyramid Peak, Eldorado Co., Calif. | June 24, 1898 |
| | 88807 | ♂ ad. | Pyramid Peak, Eldorado Co., Calif. | June 24, 1898 |
| | 88790 | ♀ ad. | 3700 ft. alt., Eldorado Co., Calif. | June 3, 1896 |
| | 88791 | ♀ ad. | 3700 ft. alt., Eldorado Co., Calif. | June 4, 1896 |
| | 88786 | ♂ ad. | 4000 ft. alt., Eldorado Co., Calif. | June 7, 1896 |
| | 88787 | ♂ ad. | 4000 ft. alt., Eldorado Co., Calif. | June 7, 1896 |
| | 88788 | ♀ ad. | 6000 ft. alt., Eldorado Co., Calif. | June 11, 1896 |
| | 88789 | ♀ ad. | 7500 ft. alt., Eldorado Co., Calif. | June 13, 1896 |
| | 88809 | ♂ ad. | Placerville, Eldorado Co., Calif. | July 6, 1896 |
| | 88810 | ♂ ad. | Placerville, Eldorado Co., Calif. | July 11, 1896 |
| | 88808 | ♂ ad. | Slippery Ford, Eldorado Co., Calif. | June 10, 1898 |
| | 78748 | ♂ ad. | Glen Alpine, Eldorado Co., Calif. | June 27, 1903 |
| | 78749 | ♂ ad. | Glen Alpine, Eldorado Co., Calif. | June 27, 1903 |
| | 78750 | ♂ ad. | Glen Alpine, Eldorado Co., Calif. | June 27, 1903 |
| | 41629 | ♂ ad. | Blue Cañon, Placer Co., Calif. | June 3, 1879 |
| | 25813 | ♀ ad. | Big Trees, Calaveras Co., Calif. | June 12, 1880 |
| | 88811 | ♂ ad. | Gardnerville, Douglas Co., Nevada | July 13, 1898 |
| | 88812 | ♀ ad. | Gardnerville, Douglas Co., Nevada | July 14, 1898 |
| | 88813 | ♀ ad. | Sugarloaf, Douglas Co., Nevada | July 16, 1898 |
| Calif. Acad. Sci. | 17894 | ♀ ad. | Sisson, Siskiyou Co., Calif. | Aug. 2, 1910 |
| | 17896 | ♂ juv. | Sisson, Siskiyou Co., Calif. | July 30, 1910 |
| | 17897 | ♀ juv. | Sisson, Siskiyou Co., Calif. | July 30, 1910 |
| | 17898 | ♂ juv. | Sisson, Siskiyou Co., Calif. | Aug. 3, 1910 |
| | 17899 | ♀ juv. | Sisson, Siskiyou Co., Calif. | Aug. 3, 1910 |
| Carnegie Museum Pittsburgh | 15383 | ♂ ad. | Blue Cañon, Placer Co., Calif. | June 4, 1895 |
| | 15384 | ♂ ad. | Blue Cañon, Placer Co., Calif. | June 4, 1895 |
| | 15385 | ♂ ad. | Blue Cañon, Placer Co., Calif. | June 9, 1895 |
| | 15379 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | April 4, 1897 |
| Field Museum Nat. Hist. | 19016 | ♂ ad. | Blue Cañon, Placer Co., Calif. | May 26, 1881 |
| | 19015 | ♂ ad. | Blue Cañon, Placer Co., Calif. | June 8, 1882 |
| | 50560 | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 10, 1897 |
| U. S. Biol. Surv. | 203320 | ♂ ad. | Lyonsville, Tehama Co., Calif. | May 29, 1906 |
| | 203476 | ♀ ad. | Lyonsville, Tehama Co., Calif. | May 30, 1906 |
| U. S. Nat. Mus. | 92397 | ad. | Mt. Shasta, Siskiyou Co., Calif. | June 27, 1883 |
| | 92398 | ad. | Mt. Shasta, Siskiyou Co., Calif. | July 21, 1883 |
| | 99836 | ♂ ad. | Mt. Lassen, Shasta Co., Calif. | June 11, 1884 |
| | 99838 | ♀ ad. | Mt. Lassen, Shasta Co., Calif. | June 14, 1884 |
| | 99839 | ♀ ad. | Mt. Lassen, Shasta Co., Calif. | June 14, 1884 |
| | 99840 | ♂ ad. | Mt. Lassen, Shasta Co., Calif. | June 15, 1884 |
| W. L. Dawson | ..... | ♀ ..... | "Santa Barbara Co.," Calif. | Oct. 31, 1913 |
| | D 462 | ♀ ad. | Mammoth, Mono Co., Calif. | July 16, 1916 |
| | E 140 | ♀ ad. | Buck Ranch, Plumas Co., Calif. | June 26, 1917 |
| | E 155 | ♂ ad. | Buck Ranch, Plumas Co., Calif. | July 3, 1917 |
| W. O. Emerson | E 13 | ♀ | Dehesa, San Diego Co., Calif. | Feb. 19, 1917 |
|  | ..... | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 11, 1897 |
|  | ..... | ♂ ad. | Fyffe, Eldorado Co., Calif. | June 14, 1898 |
| J. Grinnell | 607 | ♂ | Pasadena, Los Angeles Co., Calif. | Jan. 11, 1896 |

PASSERELLA ILIACA MARIFOSAE—(Concluded)

| Collection | No. | Sex Age | Locality | Date |
|----------------------|-------|---------------------------------|--|----------------|
| J. Grinnell | 801 | ♂ | Pasadena, Los Angeles Co., Calif. | April 1, 1896 |
| | 4118 | ♀ | Pasadena, Los Angeles Co., Calif. | Feb. 5, 1900 |
| | 7438 | ♂ im. | Newhall, Los Angeles Co., Calif. | Oct. 29, 1905 |
| A. B. Howell | ..... | ♂ ad. | Red Point, Placer Co., Calif. | July 9, 1892 |
|  | ..... | ♂ ad. | "Plumas Co.," Calif. | June 14, 1906 |
| | 4934 | ♀ ad. | Slippery Ford, Eldorado Co., Calif. | June 11, 1901 |
| | 3288 | ♂ juv. | Mammoth, Mono Co., Calif. | Aug. 9, 1914 |
| | 3290 | ♂ juv. | Mammoth, Mono Co., Calif. | Aug. 15, 1914 |
| | 6678 | ♂ ad. | Sierra City, Sierra Co., Calif. | June 9, 1916 |
|  | ..... | ♀ ad. | Sierra City, Sierra Co., Calif. | June 25, 1911 |
|  | ..... | ♂ ad. | Sierra City, Sierra Co., Calif. | July 3, 1911 |
|  | ..... | ♂ ad. | Sierra City, Sierra Co., Calif. | July 7, 1911 |
|  | ..... | ♀ ad. | Sierra City, Sierra Co., Calif. | July 9, 1911 |
| | 4937 | ♂ juv. | Sierra City, Sierra Co., Calif. | Aug. 5, 1911 |
| | 4938 | ♀ ad. | Sierra City, Sierra Co., Calif. | Aug. 7, 1911 |
| | 4939 | ♂ juv. | Sierra City, Sierra Co., Calif. | Aug. 17, 1911 |
|  | ..... | ♀ juv. | Sierra City, Sierra Co., Calif. | Aug. 17, 1911 |
|  | ..... | ♂ im. | Sierra City, Sierra Co., Calif. | Aug. 17, 1911 |
| | 4940 | ♂ im. | Sierra City, Sierra Co., Calif. | Aug. 25, 1911 |
| | 4941 | ♂ im. | Sierra City, Sierra Co., Calif. | Aug. 27, 1911 |
|  | ..... | ♂ im. | Sierra City, Sierra Co., Calif. | Sept. 1, 1911 |
| | 4942 | ♀ ad. | Sierra City, Sierra Co., Calif. | Sept. 30, 1911 |
| 6567 | ♂ ad. | Sierra City, Sierra Co., Calif. | Sept. 22, 1916 | |
| C. Lamb | ..... | ♂ ..... | Yermo, San Bernardino Co., Calif. | May 28, 1911 |
| | 835 | ♂ ad. | Lake Tahoe, Calif. | Aug. 27, 1911 |
| J. E. Law | 682 | juv. | Mt. Tallac, Eldorado Co., Calif. | Aug. 19, 1906 |
| | 9142 | ♂ ad. | Johnsville, Plumas Co., Calif. | May 23, 1918 |
| J. & J. W. Mailliard | 1162 | ♂ ad. | Fyffe, Eldorado Co., Calif. | May 19, 1908 |
| | | ♂ ad. | Fyffe, Eldorado Co., Calif. | May 19, 1908 |
| | | ♂ ad. | Fyffe, Eldorado Co., Calif. | May 19, 1908 |
| J. R. Pemberton | 4209 | ♂ | Mt. Wilson, Los Angeles Co., Calif. | Dec. 6, 1903 |
| | 493 | ♀ | Santa Monica Mts., Los Angeles Co., Calif. | Oct. 26, 1915 |
| | 494 | ♂ | Santa Monica Mts., Los Angeles Co., Calif. | Nov. 2, 1915 |

PASSERELLA ILIACA STEPHENSI

| Collection | No. | Sex Age | Locality | Date |
|------------------|---------|---------|--|---------------|
| Mus. Vert. Zool. | 2006 | ♂ juv. | Fuller's Mill, San Jacinto Mts., Calif. | July 2, 1908 |
| | 2007 | ♀ ad. | Deer Spring, San Jacinto Mts., Calif. | July 2, 1908 |
| | 2009 | ♀ ad. | Fuller's Mill, San Jacinto Mts., Calif. | July 2, 1908 |
| | 2096 | ♀ ad. | Round Valley, San Jacinto Mts., Calif. | July 10, 1908 |
| | 2212 | ♂ ad. | Round Valley, San Jacinto Mts., Calif. | July 7, 1908 |
| | 2213 | ♂ juv. | Round Valley, San Jacinto Mts., Calif. | July 10, 1908 |
| | 2214 | ♀ ad. | Round Valley, San Jacinto Mts., Calif. | July 7, 1908 |
| | 2238 | ♂ ad. | Deer Spring, San Jacinto Mts., Calif. | July 2, 1908 |
| | 2876 | 5♂ ad. | Tahquitz Valley, San Jacinto Mts., Calif. | July 20 to |
| | 2894 | 4♀ ad. | | Aug. 2, 1908 |
| | | 5♂ juv. | | |
| | | 5♀ juv. | | |
| | 8347 | ♀ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 16, 1905 |
| | 8348 | ♂ ad. | Santa Ana R., San Bernardino Mts., Calif. | June 29, 1905 |
| | 8349 | ♀ juv. | Bluff Lake, San Bernardino Mts., Calif. | July 18, 1905 |
| | 8350 | ♀ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 24, 1905 |
| | 11285 | ♂ ad. | San Bernardino Mts., Calif. | June 21, 1889 |
| | 11286 | ♂ ad. | San Bernardino Mts., Calif. | June 24, 1889 |
| | 20501 | 7♂ ad. | Taylor Mdw., Sierra Nevada, Tulare Co., Calif. | July 19 to |
| | 20520 | 5♀ ad. | | July 25, 1911 |
| | 3♂ juv. | | | |
| | 5♀ juv. | | | |

PASSERELLA ILLACA STEPHENSI—(Continued)

| Collection | No. | Sex Age | Locality | Date | |
|--|--------------------------------|------------|---------------------------------------|---------------------------------------|----------------|
| Mus. Vert. Zool. | 20521 | ♂ juv. | Monache Mdw., Sierra Nevada, Calif. | Aug. 3, 1911 | |
| | 20522 | ♂ juv. | Monache Mdw., Sierra Nevada, Calif. | Aug. 3, 1911 | |
| | 20523 | ♀ ad. | Cannell Mdw., Sierra Nevada, Calif. | July 6, 1911 | |
| | 20524 | ♀ ad. | Cannell Mdw., Sierra Nevada, Calif. | July 6, 1911 | |
| | 20525 | ♂ juv. | Long Mdw., Sierra Nevada, Calif. | July 13, 1911 | |
| | 20526 | ♂ ad. | Long Mdw., Sierra Nevada, Calif. | July 14, 1911 | |
| | 20527 | ♀ juv. | Long Mdw., Sierra Nevada, Calif. | July 17, 1911 | |
| | 20528 | ♀ ad. | Sirretta Mdws., Sierra Nevada, Calif. | July 20, 1911 | |
| | 20529 | ♀ ad. | Sirretta Mdws., Sierra Nevada, Calif. | July 20, 1911 | |
| | 20530 | ♂ ad. | Sirretta Mdws., Sierra Nevada, Calif. | July 21, 1911 | |
| | 20531 | ♂ ad. | Sirretta Mdws., Sierra Nevada, Calif. | July 22, 1911 | |
| | 20532 | ♂ juv. | Jackass Mdw., Sierra Nevada, Calif. | July 30, 1911 | |
| | 20533 | ♂ ad. | Smith Mt., Sierra Nevada, Calif. | July 31, 1911 | |
| | 20534 | juv. | Smith Mt., Sierra Nevada, Calif. | July 31, 1911 | |
| | 20535 | ♀ ad. | Troy Mdws., Sierra Nevada, Calif. | Aug. 2, 1911 | |
| | 20536 | juv. | Troy Mdws., Sierra Nevada, Calif. | Aug. 2, 1911 | |
| | 20537 | ♂ ad. | Troy Mdws, Sierra Nevada, Calif. | Aug. 2, 1911 | |
| | 20538 | ♀ ad. | Jackass Mdw., Sierra Nevada, Calif. | Aug. 3, 1911 | |
| | 20539 | ad. | Jackass Mdw., Sierra Nevada, Calif. | Aug. 3, 1911 | |
| | 20540 | ♀ juv. | Jackass Mdw., Sierra Nevada, Calif. | Aug. 3, 1911 | |
| | 20541 | juv. | Olancha Peak, Sierra Nevada, Calif. | Aug. 17, 1911 | |
| | 20542 | ♀ juv. | Taylor Mdw., Sierra Nevada, Calif. | July 25, 1911 | |
| | 27386- | 4♂ ad. | Hume, Fresno Co., Calif. | Aug. 18 to | |
| | 27414 | 5♀ ad. | | Sept. 26, 1916 | |
| | | | 9♂ im. | | |
| | | | 4♀ im. | | |
| | | | 5♂ juv. | | |
| | | | 2♀ juv. | | |
| | | 27415 | ♂ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 19, 1916 |
| | | 27416 | ♂ | Horse Corral Mdw., Fresno Co., Calif. | Sept. 22, 1916 |
| | | 27417 | ♂ | Horse Corral Mdw., Fresno Co., Calif. | Sept. 22, 1916 |
| | | 27418 | ♂ im. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 20, 1916 |
| | | 27419 | ♀ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 23, 1916 |
| | | 27420 | ♂ ad. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 23, 1916 |
| | | 27421 | ♂ im. | Horse Corral Mdw., Fresno Co., Calif. | Sept. 23, 1916 |
| | Carnegie Museum, Pittsburgh | 15386 | ♂ ad. | San Jacinto Mts., Calif., at 8000 ft. | July 14, 1895 |
| | | 15387* | ♂ ad. | San Jacinto Mts., Calif., at 8000 ft. | July 14, 1895 |
| | | 15388 | ♂ ad. | San Jacinto Mts., Calif., at 8000 ft. | July 14, 1895 |
| | | 15389 | ♀ ad. | San Jacinto Mts., Calif., at 8000 ft. | July 14, 1895 |
| | | 15390 | ♂ ad. | San Jacinto Mts., Calif., at 8000 ft. | July 14, 1895 |
| 15391 | | ♀ ad. | San Jacinto Mts., Calif., at 8000 ft. | July 15, 1895 | |
| 15392 | | ♀ ad. | San Jacinto Mts., Calif., at 8000 ft. | July 14, 1895 | |
| | | ♀ | Santa Barbara, Calif. | Jan. 11, 1913 | |
| A. Brooks F. S. Daggett W. O. Emerson J. Grinnell | | 8106 | ♂ | Santa Monica Mts., Calif. | Nov. 24, 1915 |
| | | 627 | ♂ ad. | San Bernardino Mts., Calif. | June 24, 1889 |
| | 5816 | ♀ ad. | Mt. Pinos, Ventura Co., Calif. | June 29, 1904 | |
| | 5817 | ♂ ad. | Mt. Pinos, Ventura Co., Calif. | June 29, 1904 | |
| | 5818 | ♂ ad. | Mt. Pinos, Ventura Co., Calif. | June 29, 1904 | |
| | 5819 | ♂ ad. | Mt. Pinos, Ventura Co., Calif. | June 29, 1904 | |
| | 5820 | ♂ juv. | Mt. Pinos, Ventura Co., Calif. | June 29, 1904 | |
| | 5890 | ♀ juv. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 5891 | ♂ ad. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 5892 | ♀ ad. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 5893 | ♂ juv. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 5894 | ♀ ad. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 5895 | ♂ ad. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 5896 | ♂ ad. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 5897 | ♂ ad. | Mt. Pinos, Ventura Co., Calif. | July 11, 1904 | |
| | 6509 | ♂ juv. | Dry Lake, San Bernardino Mts., Calif. | June 22, 1905 | |
| | 6510 | ♀ ad. | Dry Lake, San Bernardino Mts., Calif. | June 22, 1905 | |

*Type.

PASSERELLA ILIACA STEPHENSI—(Concluded)

| Collection | No. | Sex Age | Locality | Date | |
|----------------------|-----------|---------|---|---|---------------|
| J. Grinnell | 6546 | ♀ juv. | Santa Ana R., San Bernardino Mts., Calif. | June 27, 1905 | |
| | 6547 | ♂ ad. | Santa Ana R., San Bernardino Mts., Calif. | June 27, 1905 | |
| | 6561 | ♀ ad. | Santa Ana R., San Bernardino Mts., Calif. | June 29, 1905 | |
| | 6732 | ♀ juv. | Bluff Lake, San Bernardino Mts., Calif. | July 16, 1905 | |
| | 6746 | ♀ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 17, 1905 | |
| | 6753 | ♀ juv. | Bluff Lake, San Bernardino Mts., Calif. | July 18, 1905 | |
| | 6754 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 18, 1905 | |
| | 6755 | ♀ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 18, 1905 | |
| | 6772 | ♂ juv. | Bluff Lake, San Bernardino Mts., Calif. | July 19, 1905 | |
| | 6775 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 19, 1905 | |
| | 6800 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 21, 1905 | |
| | 6801 | ♀ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 21, 1905 | |
| | 6840 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 24, 1905 | |
| | 6874 | ♀ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 27, 1905 | |
| | 7225 | ♂ im. | Sugarloaf, San Bernardino Mts., Calif. | Aug. 19, 1905 | |
| | 7226 | ♂ im. | Sugarloaf, San Bernardino Mts., Calif. | Aug. 19, 1905 | |
| | 7257 | ♀ im. | Sugarloaf, San Bernardino Mts., Calif. | Aug. 22, 1905 | |
| | 7311 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | Aug. 29, 1905 | |
| | 7312 | ♀ im. | Bluff Lake, San Bernardino Mts., Calif. | Aug. 29, 1905 | |
| | 7357 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | Aug. 31, 1905 | |
| | 7358 | ♂ im. | Bluff Lake, San Bernardino Mts., Calif. | Aug. 31, 1905 | |
| | 7627 | ♂ ad. | Santa Ana R., San Bernardino Mts., Calif. | July 24, 1906 | |
| | 2943 | ♂ ad. | Mt. Waterman, San Gabriel Mts., Calif. | July 10, 1897 | |
| | 2944 | ♀ ad. | Mt. Waterman, San Gabriel Mts., Calif. | July 10, 1897 | |
| | 2945 | ♂ ad. | Mt. Waterman, San Gabriel Mts., Calif. | July 10, 1897 | |
| | 2946 | ♂ ad. | Mt. Waterman, San Gabriel Mts., Calif. | July 10, 1897 | |
| | 2947 | ♂ juv. | Mt. Waterman, San Gabriel Mts., Calif. | July 10, 1897 | |
| | 2969 | ♂ juv. | Mt. Waterman, San Gabriel Mts., Calif. | July 16, 1897 | |
| | 2973 | ♂ ad. | Mt. Waterman, San Gabriel Mts., Calif. | July 17, 1897 | |
| | 2983 | ♀ juv. | Mt. Waterman, San Gabriel Mts., Calif. | July 18, 1897 | |
| | J. E. Law | 355 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | July 24, 1905 |
| | | 2235 | ♂ ad. | Bear Lake, San Bernardino Mts., Calif. | June 3, 1914 |
| | | 1424 | ♀ | Hollywood, Los Angeles Co., Calif. | Feb. 22, 1912 |
| J. & J. W. Mailliard | 8095 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | Aug. 22, 1910 | |
| | 8096 | ♂ ad. | Bluff Lake, San Bernardino Mts., Calif. | Aug. 24, 1910 | |
| G. F. Morcom | 3415 | ♀ ad. | Bear Valley, San Bernardino Mts., Calif. | June 9, 1886 | |
| | 3426 | ♂ ad. | Bear Valley, San Bernardino Mts., Calif. | June 10, 1886 | |
| | 3445 | ♂ ad. | Bear Valley, San Bernardino Mts., Calif. | June 12, 1886 | |
| | 3444 | ♂ juv. | Bear Valley, San Bernardino Mts., Calif. | June 12, 1886 | |
| W. M. Pierce | 233 | ♂ ad. | Bear Valley, San Bernardino Mts., Calif. | May 31, 1914 | |
| | 236 | ♂ ad. | Bear Valley, San Bernardino Mts., Calif. | May 31, 1914 | |
| | 706 | ♀ ad. | Lytle Cr., San Bernardino Mts., Calif. | Aug. 31, 1915 | |
| | 853 | ..... | Lytle Cr., San Bernardino Mts., Calif. | Sept. 3, 1914 | |
| | 1007 | ♀ ad. | Bear Valley, San Bernardino Mts., Calif. | June 21, 1915 | |
| | 1117 | ..... | Lytle Cr., San Bernardino Mts., Calif. | Aug. 30, 1915 | |
| C. H. Richardson | 1762 | ♂ | Palmer's Cañon, Los Angeles Co., Calif. | Jan. 11, 1919 | |
| | 317-318 | ♂ | Piute Mts., Kern Co., Calif. | Sept. 2, 1903 | |
| H. S. Swarth | 9999 | ♂ im. | Strawberry Valley, San Jacinto Mts., Calif. | Sept. 9, 1914 | |

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PLATE 4

Fig. 1. Reading from top to bottom, the birds figured are the Shumagin fox sparrow (*Passerella iliaca unalaschcensis*), Mus. Vert. Zool., no. 23282; sooty fox sparrow (*Passerella iliaca fuliginosa*), Mus. Vert. Zool., no. 16253; Stephens fox sparrow (*Passerella iliaca stephensi*), J. Grinnell collection, no. 7311; and Yolla Bolly fox sparrow (*Passerella iliaca brevicauda*), H. S. Swarth collection, no. 199. About one-half natural size.

The Shumagin fox sparrow and the sooty fox sparrow illustrate the extremes of coloration reached in the subspecies of *Passerella iliaca* occurring on the northwest coast of North America (the "Unalaschcensis group"). The Shumagin fox sparrow, the northernmost race, is the palest in color of this group, the sooty fox sparrow, the southernmost race, is the darkest. These extremes are linked together by four other subspecies occurring at intermediate points and variously intermediate in coloration. Color is the principal character differentiating the members of this group.

The Stephens fox sparrow and the Yolla Bolly fox sparrow represent extremes attained along two different lines of development followed by the subspecies of *Passerella iliaca* in the western United States (the "Schistacea group"). Each has an extremely large bill, but of different shapes. These subspecies also differ in proportionate length of wing and tail, and slightly in color. In the Stephens fox sparrow the bill is more narrow and sharp-pointed, the tail is relatively long, and the general coloration is quite grayish. In the Yolla Bolly fox sparrow the bill is broad and stubby, the tail is relatively short, and there is a distinctly brownish tinge to the coloration. There are no intergrading subspecies directly connecting the two forms *stephensi* and *brevicauda*, but there are such intergrades connecting each one with still another subspecies, *schistacea*.



PLATE 5

Fig. 2. Meadow on the mountain side at Port Snettisham, southeastern Alaska. The Townsend fox sparrow (*Passerella iliaca townsendi*) was found here in fair abundance, mostly in the densest underbrush. Photograph taken August 25, 1909.

Fig. 3. Tahquitz Valley (8000 feet altitude), San Jacinto Mountains, California. The trees in the middle distance are mostly Jeffrey pine and silver fir, those on the higher slopes in the background, lodgepole pine and limber pine. The brush covering the hillside in the foreground is chinquapin. Stephens fox sparrow is an abundant summer visitant to this valley, frequenting for the most part the densely matted chaparral formed by the chinquapin. Tahquitz Valley is the type locality of *Passerella iliaca stephensi* Anthony. Photograph taken September 11, 1914.



Fig. 2



Fig. 3

PLATE 6

Fig. 4. Fort Tejon, Kern County, California. This locality is in the Upper Sonoran zone, the buildings set amid hills whose slopes are covered with dense chaparral. In the more level places there are many live oaks, and along the streams, sycamores and thickets of willows. These are the characteristic surroundings sought by the more northern subspecies of fox sparrow for their winter home in southern California. Fort Tejon is the type locality of *Passerella megarhynchus* Baird, the type specimen, a winter bird, having been taken there some time prior to 1858. Fort Tejon is the type locality for other species of birds also, as well as for certain mammals and reptiles, hence is a point of special interest as regards the early history of zoology in California. The old fort, itself, is the adobe building at the left, under the oak trees. Photograph taken July 24, 1918.



PLATE 7

Fig. 5. Little Onion Valley (altitude 7500 feet), Sierra Nevada, on the Inyo County side, near Kearsarge Pass, California. The scattered conifers are mostly silver fir; the small trees along the stream are willow, alder and birch; the chaparral on the hillsides is mostly manzanita and sage. The Yosemite fox sparrow (*Passerella iliaca mariposae*) is an abundant summer visitant to this place. A nest was found in a manzanita bush shown in the foreground of this picture. Photograph taken June 3, 1912.

