

No. 6. — *Notes of an Ornithological Reconnoissance of Portions of Kansas, Colorado, Wyoming, and Utah.* BY J. A. ALLEN.

IN the following pages are indicated some of the results of field work on the Plains and in the central portions of the Rocky Mountains; these results including more or less complete annotated lists of the birds of nine quite widely separated localities, with a general summary of the whole. Although the region in question presents by no means a new field, the faunal lists here offered form the first special reports that have been made upon the ornithology of any restricted locality within the region referred to at the head of this article. The observations on which the following lists are based were made in 1871 (from May 1 to January 15, 1872), during an expedition sent out by the Museum of Comparative Zoölogy to the Rocky Mountains to obtain specimens of the vertebrated animals of the plains and mountains of the West. The expedition commenced its work at the Missouri River, in the vicinity of Fort Leavenworth, and collected at intervals thence westward to the Great Salt Lake Valley. Mr. Richard Bliss, Jr., of the Museum, accompanied the expedition as ichthyologist; and Mr. C. W. Bennett of Springfield, Massachusetts, as taxidermist. Both of these gentlemen rendered important aid in the ornithological work, Mr. Bennett adding to his zeal the qualifications of an experienced collector and a skilful sportsman. Among the acquisitions of the expedition are over fifteen hundred birds, representing about two hundred species, besides large suites of nearly all the mammals of the region visited, including all the large herbivorous species, large collections of fishes, many reptiles and insects.

An opportunity was thus afforded me of studying many species of birds in the field which I had previously seen only as dried skins, and of examining large series of fresh specimens of many of the puzzling forms of the middle region of the continent. From this has resulted a confirmation of all the general conclusions arrived at in my recent paper on the "Winter Birds of East Florida,"* and the discovery of several well-marked geographical races not previously chronicled. In the woodlands of Eastern Kansas a decided general tendency to a

* Bull. Mus. Comp. Zoöl., Vol. II, No. 3, April, 1871.

greater intensity of color than at the northward was noticed, in accordance with the law of the increase in intensity of color to the southward,* which in several species was especially marked. The males of the common indigo-bird (*Cyanospiza cyanea*) were not only much more than ordinarily lustrous, but the females shared the blue tint of the males to an unusual degree. There was here found also a thick-billed race of the cardinal (*Cardinalis virginianus*), which in the size and form of the bill makes a decided approach to the thick-billed race of this bird found in Lower California (*C. igneus* auct.). The hairy woodpecker begins to noticeably resemble the darker (*Picus Harrisii*) race of the Rocky Mountains, and *Colaptes auratus* has quite commonly a greater or less number of red feathers mixed with the black ones forming the maxillary patches, thus clearly showing a marked tendency to a differentiation towards the *C. mexicanus* of the western half of the continent, at a point some six hundred miles east of the habitat of that species. A well-marked variation is also noticeable in the *Icterus Baltimore*, through the paler colors of the middle wing-coverts, which in Middle Kansas become either pure white or are only faintly tinged with pale yellowish, instead of being orange, as in the eastern form. With this gradual change in the color of the coverts the white edgings of the remiges become greatly broadened, as in the so-called *Parus septentrionalis*, the latter being here less strongly marked in this respect than further westward. The bill of the *Icterus Baltimore* is here slenderer and rather more decurved than in northern specimens. Professor Baird has also recorded a specimen of *Pipilo erythrophthalmus* from Fort Leavenworth, which "has a few white spots on the scapulars only, the wing-coverts without them, exhibiting an approach to *P. arcticus*," † and remarks that other western specimens have more than the usual amount of white on the wings. The Fort Leavenworth specimen he regards as "probably a hybrid," between *P. erythrophthalmus* and *P. arcticus*. While only one of our Fort Leavenworth specimens thus approached *P. arcticus*, all resembled it in the enlarged hind claw, and in a more than the usual amount of white on the wing.‡

* See Bull. Mus. Comp. Zool., Vol. II, p. 233.

† Birds of North America, p. 513.

‡ In respect to the claws, I find that in the *Pipilos* of this group there is a decided enlargement of the claws to the southward, along the Atlantic coast, as well as in the interior and on the Pacific coast, this enlargement reaching its maximum in Lower California, in *Pipilo megalonyx* of this group. Florida specimens have larger claws—

Passing to the Plains proper, the faded aspect of all the birds is strikingly noticeable, especially in the species that range across the continent. The well-known "*neglecta*" type of *Sturnella ludoviciana*, the "*Henryi*" type of *Chordeiles popetue*, the "*rufa*" type of *Eremophila alpestris*, the "*Cassinii*" type of *Peucaea aestivalis*, the "*Parkmanni*" type of *Troglodytes aëdon*, the "*septentrionalis*" type of *Parus atricapillus*, are not only prevalent forms, but corresponding pallid forms are equally marked in *Coturniculus passerinus*, *Spizella socialis*, *Falco sparverius*, *Ægialitis vociferus*, and others; these pallid races prevailing throughout the arid plains to the westward. The same tendency is manifest in the mountains of Colorado, where the *Sitta* "*pygmæa*" forms a similar pale race of *Sitta pusilla*;* *Zonotrichia leucophrys*, through the greater amount of ashy white on the lores, passes into *Z. "Gambeli"*; *Geothlypis Macgillivrayi* permanently retains white spots on the eyelids, which appear in *G. Philadelphia* only in the young and in the females. *Pipilo erythrophthalmus*, through an acquisition of white streaks on the back and wings, becomes *P.*

more noticeably that of the hallux — than those from Massachusetts; and in those from Eastern Kansas they are fully as large as in Florida specimens, while the "*P. arcticus*" in Colorado has them still larger. On the Pacific coast the specimens from Oregon have small claws, the size increasing southward to Lower California, where they become excessively enlarged. This increase in the size of the claws to the southward I have traced in several other genera, it corresponding with the increase in the size of the bill in the warmer latitudes, and is doubtless due to a similar climatic cause. See Bull. Mus. Comp. Zool., Vol. II, pp. 230, 239.

* *Sitta "pygmæa"* differs from *S. pusilla* in being everywhere lighter colored; the head is greenish ashy brown instead of pale hair brown, the back is less deeply blue, and the white markings on the tail and wings are broader and purer. In *S. pusilla* the middle tail-feathers are generally only slightly paler at their bases, but are sometimes distinctly white, as they almost always are in *S. pygmæa*. The oblique white bar on the other tail-feathers is also much broader and more strongly white in *S. pygmæa*. In *S. pusilla* the edge of the wing is generally pale grayish white, but sometimes distinctly white, as are also the basal portions of the inner webs of the greater primary coverts. In *S. pygmæa* the white on the edge of the wing is not only more strongly marked, but covers also a larger portion of the inner vanes of the greater primary coverts, and the concealed basal portion of the primaries also shares the white. The outer edges of the primaries are also more broadly bordered with white than those in *S. pusilla*. The style of markings in the two forms is identical, only that the white is more pronounced and the general tints paler in *S. pygmæa* than in *S. pusilla*, apparently establishing it as a paler race of the latter, co-ordinate with so many other similar examples of pallid races in the interior of the continent.

In like manner the western race of *Sitta carolinensis* (*S. aculeata* Cass.) has less black on the inner secondaries than has the eastern form of this species.

"*arcticus*"; and *Picoides* "*americanus*" becomes *P. dorsalis*, through a somewhat similar increase of white in the dorsal plumage. All the Vireos of the Rocky Mountain plateau are paler races of species that range across the continent, the difference in some of them being so great as to give them the character of strongly marked geographical varieties. Most of the *Empidonaces* are here also similarly represented; and farther southward and westward occur pallid forms of *Myiarchus* and *Tyrannus*; everywhere establishing the law of pallid races in arid regions, which there represent the brighter conspecific forms of the contiguous moister districts. The differences in color between the conspecific forms of arid and of comparatively moist regions is much greater, as a rule, towards the end of the breeding season, or just before the autumnal moult, than after this moult, or in spring specimens, or than is observed between young birds of the two forms; showing most unmistakably the direct influence of the intensely heated dry winds and strongly reflected light upon the colors of birds in semi-desert regions.

Recent investigations show a rather greater tendency to an enlargement of the bill to the southward along the Pacific slope of the continent than that pointed out in my paper on the Florida Birds as existing to so marked a degree among the birds of the Atlantic States.* Instances are seen in the southern forms of the *Chrysomitris psaltria* group, in the *Carpodacus purpureus* group, in the *Cardinalis virginianus* group, in *Curvirostra* "*americana*," in the *rostratus* form of *Passerculus*, in the western forms of *Melospiza melodia*, in *Passerella* "*schistacea*," and in the *Pyrrhula aestiva* and *P. ludoviciana* groups; it is also well illustrated by *Certhia familiaris*, *Mniotilta varia*, and almost constantly in the *Vireonidæ*, as well as in numerous other families.

From the valley of the Columbia River a comparatively narrow belt extends northward along the Pacific coast, where the annual rainfall is nearly double that of any other portion of the continent; and here the birds (and mammals also), as a general rule, not only reassume the brighter colors of the region east of the Great Plains, but in many cases present a depth of color unequalled eastward in the same latitudes, frequently taking on a peculiar deep plumbeous or dusky brown in replacement of ashy or rufous, with a partial obsolescence of spots and streaks, especially marked in several of the fringilline genera.

* See Bull. Mus. Comp. Zool., Vol. II, p. 230.

In respect to the rank and relationships of a great number of forms among North American birds, to which at first was accorded the rank of species, the gradual passage of one form into another, through whole groups of forms that, as it were, cluster about a common type, is an interesting and suggestive fact. Every acquisition of new material from the middle and western portions of the continent but the more fully shows the complete and gradual coalescence of widely differing forms, which reach their typical or maximum development at particular localities, characterized by special climatic conditions, but which intergrade at intermediate points, where the conditions of environment are also of an intermediate character. In illustration of this, the genera *Pipilo*, *Junco*, *Melospiza*, *Passerella*, *Carpodacus*, *Colaptes*, and *Picus* may be cited from among the numerous and more strongly marked examples of longitudinal variation.* In respect to the *Pipilos* of the United States, the *P. erythrophthalmus* of the East passes southward into a well-marked form in Florida, differing from the northern race in having the white on the wings and tail much more restricted, in its smaller size, larger claws, and longer tail. To the westward it begins at the Missouri River to pass into the *P. arcticus*, through the occasional accession of white streaks on the scapulars and interscapulars, and its larger claws; these characters — especially the development of white in the dorsal plumage — reach their maximum on the dry plateau of the interior; but westward *P. arcticus* merges into another form, *P. oregonus*, towards and on the Pacific coast, in which the white on the wings becomes again reduced, the white streaks on the back (though generally still retained) become narrower and fewer, and at times are either almost or entirely obsolete, and the claws become considerably smaller. To the southward the two forms, in the interior, run into each other, both culminating in Lower California in the *P. megalonyx*, in which the claws have become enormously developed, and the white spotting varies from obsoleteness to the large amount that typically characterizes *P. arcticus*. Further southward, in Mexico, *P. megalonyx* is well-known to grade through *P. macronyx* into *P. maculatus*, which are more or less olivaceous. *Junco* presents three strongly marked forms or “species,” that in a similar manner inosculate; *J. hyemalis* being the eastern form, *J. oregonus* the western, and *J. caniceps* occupying an intermediate region at the southward, between the habitats of the others;

* See also Bull. Mus. Comp. Zoöl., Vol. II, p. 237.

but they more or less mix up during winter, and specimens are of frequent occurrence that, from their not being referable to either form, have been assigned to the series of "*hybrids*." *J. caniceps* is the most strongly marked form, in its having the middle of the back reddish, forming a restricted, well-defined patch. *J. oregonus* has the back also reddish, this color occupying a larger area than in *J. caniceps*, more diffused, and involving the secondaries; but its extent and intensity varies greatly in different individuals. The sides are also tinged with a pinkish rufous tint, and the slate of the anterior half of the body is darker than in the other. *J. hyemalis* has the rufous tint present only in young or autumnal specimens, which sometimes strongly approach *J. oregonus*. *J. oregonus*, on the one hand, inosculates with *J. caniceps*, and on the other, with *J. hyemalis*; *caniceps* and *oregonus* both apparently merging into *J. cinereus* of Mexico, through the scarcely distinguishable *J. dorsalis*. *Melospiza melodia* is represented in the interior by a race (*M. fallax*) paler than the eastern, and on the Pacific coast by a darker race, which again divides into a northern (*M. insignis*) and a southern (*M. Heermanni et Gouldii*, etc.), all of which so intergrade as to be but unsatisfactorily definable, though in their extreme stages they present strong points of difference. Few congeneric species, it would seem, need be more distinct than *Colaptes auratus* and *C. mexicanus*, the one occupying the eastern and the other the western side of the continent. Yet a mixed race has been long known to exist in the region where their habitats adjoin, in which every possible combination of the characters of the two birds is presented, and which shade off gradually on the one side into *C. auratus*, and on the other into *C. mexicanus*; these, as it were, engrafted characters not entirely fading out in either direction for a distance of several hundred miles; while to the southwestward is a smaller synthetic race (*C. chrysoides*) partaking mainly of the characters of *C. auratus*.

When but comparatively few instances were known, in which specimens combined in various degrees the characters of two quite distinct species, their synthetic character was generally explained by the theory of hybridity; but the irrefragibility of the evidence now at hand in proof of the gradual intergradation of such forms over large areas, — the transition being so gradual as to occupy hundreds of miles in the passage, — and also coincident with a similarly gradual change in the conditions of environment, together with the demonstrable evidence of the

power of climatic influence, seems to furnish a far more satisfactory explanation of these perplexing phenomena. But an advocate of the theory of hybridity might still assume that this gradual transition over a wide area is no objection to the theory, since the gradual fading out of the impression of contact in either direction from the line of junction of the respective habitats of two forms is just the result that would be anticipated from such a sexual intermingling of the forms in question. But the real objection to the theory — granting the possibility of hybridization on such a gigantic scale, which seems really improbable — is, that widely different forms occur also at different points in latitude, between which each successive stage of gradual differentiation can be readily traced, where hybridity can scarcely be supposed to account for the gradual change. Furthermore, a differentiation is now known in so many cases that it amounts to the demonstration of climatic variation as a general law, by means of which a species may be safely predicted to take on a given character under certain specific climatic conditions. If the theory of hybridity be urged to account for the intergradation of forms occurring at localities differently situated in respect to latitude, as has been sometimes done, it evidently falls under the weight it has to support; and yet there seems to be little better evidence in its behalf in cases where the intergrading forms happen to be differently situated in respect to longitude.

In regard to how these well-marked geographical forms shall be recognized, there may be just grounds for a diversity of opinion. Evidently in cases where they are slightly marked or somewhat inconstant, no great harm would result if they were nominally ignored. Practically, most naturalists recognize as species such groups of individuals as are not known to graduate by nearly imperceptible stages into any other similar group; and as varieties, such groups of individuals as occur at certain localities, or over certain areas, which differ more or less from other groups of individuals inhabiting other (generally contiguous) localities, with which there is evidence that they do, more or less fully, intergrade. Convenience seems to demand such a course, in order to enable the naturalist to specify what particular phase or race of a species inhabits a given section of country; the first specific name used for any part of the group being, of course, retained for the longest known form, and the other races, when of such prominence as to render naming them advisable, being designated by additional varietal names; as, for

example, *A b, var. c.* This method is, indeed, already in more or less common use.

The division of the middle and western portions of North America into faunal areas is still attended with many difficulties, partly from the absence of data, and partly from the peculiarly varied character of the surface. The presence or absence of forests, directly resulting from the peculiarities of climate, seems to be among the most effective influences in the modification of the range of species. If a nearly unbroken forest extended from the Atlantic to the Pacific, with the nearly uniform conditions of humidity that would naturally follow, undoubtedly many species would range across the continent, or at least to the base of the Rocky Mountains, that now extend westward from the Atlantic coast only to the edge of the Great Plains; the western slope of the continent would differ less in its animal life from the eastern than it now does, and the middle region would lack the widely different zoölogical aspect it now presents from that of either the Atlantic or the Pacific coast regions. With the present elevation of the interior, and the resulting climatic conditions, nearly all the woodland species of the East not only range westward to the treeless districts of the interior, but extend up the rivers that descend from the central plateau as far as these streams are skirted to any considerable degree with trees; a few not only reach the base of the Rocky Mountains, but pass around the higher elevations of the chain in Colorado, by means of the northern valleys, and occur on the Pacific coast, while others reach the same coast by gaps in the mountains at the southward. On the other hand, most of the field and prairie species, or those which are but slightly dependent upon woodlands for shelter or sustenance, do not disappear at the edge of the plains, as do the strictly woodland species, but range not only over the plains of the middle region, but also over the plains to the westward of the main chain of the Rocky Mountains, and thence generally to the Pacific coast. In the wooded parts of the Rocky Mountains a few species occur that are peculiar to that region, but the greater part are either but slightly modified forms of eastern species, or forms that, while they differ widely from both the eastern and western, still freely "hybridize" or intergrade with them. These strictly western forms, unless of alpine or subalpine distribution, also generally occur along the streams of the western edge of the Plains, as far as the streams are bordered with trees.

The observations made the past summer (given below in detail) establish the occurrence of a number of eastern species at points several hundred miles to the westward of the westernmost point from which they have been previously recorded; and in like manner other western species were found occurring at points considerably to the eastward of points from which they were before known. Northern species were also found at localities considerably south of their previously known range, both *Anthus ludovicianus* and *Leucosticte tephrocotis* being found breeding above timber-line in the mountains of Middle Colorado. A more extensive overlapping of the habitats of eastern and western species is thus established than there was previous evidence of, which may tend to modify the currently received boundary between the Eastern and Middle Provinces of the North American Region. This boundary has generally been considered as running in the United States near the 100th meridian, or "at the edge of the sterile plains." But the distinctively "Plains species" are nearly all found now to range eastward over the prairies, the others first appearing somewhat to the westward. Thus of about twenty species that are distinctively characteristic of the Plains, fully one third occur on the prairies of Illinois and Wisconsin, another third are met with as far east as Missouri, and the others range more or less regularly into Eastern Kansas. In other words, all the species of the Plains occur in Kansas at points from two hundred to three hundred miles to the eastward of the 100th meridian, and most of the others extend to the woodland districts eastward of the Mississippi. On the other hand, many eastern species follow up the rivers to the most western limit of trees, sometimes to a distance of three hundred miles west of their formerly supposed western limit, where they mix with western species not commonly supposed to occur much to the eastward of the eastern base of the Rocky Mountains.

The faunæ of the middle and western portions of the continent present peculiarly broken and irregular areas, in consequence of the great irregularity of the surface of the country. The more southern faunæ, while occupying the lower table lands, extend also up into the lower mountain valleys, to a limit varying with latitude and the peculiar local conditions of the valleys themselves. Above this basal zone occur several other zones, which are continuous for considerable distances along the main chains, but also embrace distant insular patches in the more isolated groups of mountains. The higher zones are still less regular

in their continuity and in their respective areas, the highest having an arctic character and occupying only the partially snow-covered summits that rise above the limit of tree-growth. But at present the data at hand are too few for a satisfactory attempt at an analysis of the characters and limits of the several avian faunæ of the Middle and Western Provinces.

I. *List of Birds observed at Leavenworth, Kansas, from May 2 to May 11, and at Topeka, Kansas, from May 11 to May 24, 1871; with Annotations.*

THE following list embraces one hundred and twenty-one species, of which specimens of nearly all were actually collected. Though an incomplete list of the birds of Eastern Kansas, and based on observations made when many of the species were migrating, it is believed to contain many facts of value, especially since no report has as yet been made of the ornithology of this section of country.* Our collections at Leavenworth were made principally in the heavy timber on the East Leavenworth side of the Missouri River, opposite Fort Leavenworth. A few specimens were collected on the west bank of the river, on the military reservation between the fort and the city, where is also considerable timber. Most of the water birds were obtained about a lagoon on the Missouri side. In the forests the birds were excessively abundant, both in species and individuals. Among them such southern forms as *Helminthophaga pinus*, *Oporornis formosus*, *Wilsonia* (= *Myiodi-ocetes*) *mitrata*, *Thryothorus ludovicianus*, *Icteria virens*, *Cardinalis virginianus*, and *Lophophanes bicolor* were conspicuously numerous, the fauna being emphatically Carolinian.† Although the vegetation was as far advanced the 1st of May as it usually is in Southern New England the 1st of June, very few birds had commenced nesting, and some of the later-arriving species had not yet appeared. By the 10th of May nearly all the trees were in full leaf, and most of them were leafing by the first of the month. The only nests found were those of

* Since the above was written there has appeared a "Catalogue of the Birds of Kansas," by Professor F. H. Snow, of Lawrence, Kansas. The list contains the names of 239 species, yet some of the most characteristic birds of the western half of the State are omitted. The author has attempted to indicate those "known to breed in the State," but it is in this respect very imperfect, though still not without much value as a faunal list. (See *Am. Nat.*, Vol. VI, 1872, p. 359.)

† See *Bull. Mus. Comp. Zool.*, Vol. II, p. 393, 1871.

Harporhynchus rufus, *Pipilo erythrophthalmus*, and *Cardinalis virginianus*, but fledged young of *Thryothorus ludovicianus* were shot May 3d.

At Topeka, about the same number of species were observed as at Leavenworth. Some of those obtained at Topeka, however, were not seen at Leavenworth, and others that were common at Leavenworth were not noticed at Topeka. Yet the general character of the fauna at the two places is quite similar, as would naturally be expected; Topeka being only about sixty miles from Leavenworth, in a southwesterly direction. At Topeka our excursions were mainly confined to the timbered bottom lands of the Kaw River. Though most of the larger trees had been removed, the locality was still tolerably well wooded, and in many places there was a dense undergrowth of hazels, sumachs, and other shrubs. The adjoining prairies were visited a few times, and one excursion was made to the Wakarusa, ten miles to the southward. Here, however, only one species (*Polioptila cærulea*) was taken that was not also seen at Topeka.

At Topeka the birds were even more numerous than at Leavenworth. In the course of half an hour, on the day of our arrival (May 12th), I saw or heard thirty species of birds, by actual count, and in most cases observed a number of individuals of each. This, however, seems to be a feature more or less common to prairie regions, where the timber is restricted to narrow belts along the streams. Especially does this seem to be the case during the season of migration; but it was also observed later in the season at Fort Hays.

Although the forests were in full leaf on our arrival, we noticed that several species of birds became common during the last days of our stay there, that were not met with at first. Among them were such species as *Seiurus aurocapillus*, which usually arrives in New England at the time of the first leafing of the trees. Ripe wild strawberries were abundant as early as May 15th, and the weather was as hot, from this date till we left Topeka, as it usually is in Southern New England in July, the maximum temperature daily increasing from 84° to 94° F. in the shade.

When no locality is mentioned in the remarks that follow, it is to be understood that the species was observed at both Leavenworth and Topeka in about the same numbers. A star is prefixed to the names of those known to breed in Eastern Kansas, whether from personal observation or from their known breeding range including the localities in question.

TURDIDÆ.

1. **Turdus migratorius*. Only two were seen. Said to be a scarce resident.
2. **Turdus mustelinus*. Exceedingly abundant. Quite unsuspicious and apparently not yet nesting. Song less melodious and less varied than in the Eastern States. Colors considerably brighter.
3. *Turdus Swainsoni*. Common at Topeka. All of the eight or ten specimens taken were females, the males probably having already gone north. These specimens were also all strongly suffused with rufous. One was shot at Leavenworth, May 8th, and a few others seen.
4. *Turdus Pallasi*. A single female, with the plumage excessively worn and faded, was taken at Topeka, May 18th.
5. **Harporhynchus rufus*. Abundant. Nest and three eggs obtained May 3d, at Leavenworth. Nest placed in bushes, several feet from the ground. A nest nearly finished was also found May 19th at Topeka, placed on the ground, under a small bush in an open field.
6. **Mimus carolinensis*. Abundant.

SAXICOLIDÆ.

7. **Sialia sialis*. Common. Said to be resident.

SYLVIIDÆ.

8. **Polioptila cærulea*. Three specimens were seen and two taken May 22d near Topeka. These were the only ones observed.

SYLVICOLIDÆ.

9. *Parula americana*. Common.
10. **Helminthophaga pinus*. Not uncommon.
11. *Helminthophaga celata*. Common at Leavenworth.
12. *Helminthophaga ruficapilla*. Common at Leavenworth.
13. **Dendræca æstiva*. Moderately common. The streaks on the breast, in the few specimens taken, were very broad and conspicuous, much broader and the colors generally much brighter than they are often seen in specimens from the Eastern States.
14. *Dendræca pennsylvanica*. Not common. One specimen shot at Leavenworth, and three or four others seen. Not observed at Topeka.
15. *Dendræca Blackburniæ*. One specimen shot at Leavenworth, May 4th, — the only one seen.
16. **Dendræca cærulea*. One specimen taken at Leavenworth, and a number of others seen. Apparently rather common in the forests of the Missouri bottom.
17. *Dendræca coronata*. One specimen seen May 3d at Leavenworth, the only one observed.

18. * *Dendræca discolor*. Rather frequent.
19. *Mniotilta varia*. Not common. Two specimens obtained at Leavenworth, and two or three others seen.
20. * *Seiurus aurocapillus*. First observed May 15th; afterwards common.
21. * *Geothlypis trichas*. Common at Topeka; only a few were seen at Leavenworth, where it arrived about May 8th.
22. *Geothlypis philadelphia*. One specimen obtained May 16th at Topeka, where others were seen later.
23. * *Oporornis formosus*. Common. Nest found nearly completed May 16th.
24. * *Wilsonia mitrata*. Rather common at Leavenworth; less so at Topeka.
25. *Setophaga ruticilla*. Common, but only males were taken or observed.
26. * *Icteria virens*. Rather common at Leavenworth. Abundant at Topeka, where three or four males were often seen hovering in the air and singing at the same time.

TANAGRIDÆ.

27. * *Pyrranga rubra*. Very abundant. The colors of those obtained were unusually intense, as compared with northern specimens.

PARIDÆ.

28. * *Parus atricapillus*. Abundant.
29. * *Lophophanes bicolor*. Abundant. One of the most numerously represented and most noisy species met with at Leavenworth; not so abundant at Topeka.

SITTIDÆ.

30. *Sitta carolinensis*. Common at Leavenworth.

TROGLODYTIDÆ.

31. * *Troglodytes ædon*. Common.
32. * *Thryothorus ludovicianus*. Common at Leavenworth. Not seen at Topeka. They apparently breed very early, as we shot a young one fully fledged May 3d.

HIRUNDINIDÆ.

33. * *Hirundo horreorum*. Moderately common.
34. *Hirundo bicolor*. Common, especially at Leavenworth.
35. * *Hirundo lunifrons*. Common at Leavenworth; less numerous at Topeka. At the latter locality several pairs were seen along the bluffs of

the Kaw River, in company with *Cotyle riparia*, entering the holes in the bank in company with that species, and also sitting in the mouths of the holes. One was shot as it left a hole, so that there is no reason for doubting the observation. They had the same appearance of breeding in the banks as *Cotyle riparia* themselves.

36. **Cotyle riparia*. Exceedingly abundant, especially at Topeka. Hundreds of them were excavating their holes in the bluffs of the Kaw River, May 15th to 20th, but had not yet commenced to lay. At least no eggs were found in any of a considerable number of nests examined.

37. **Cotyle serripennis*. Common. They appear to breed either singly, or a few pairs together, and not in large colonies like *Cotyle riparia*. They were excavating their holes, but had not yet laid.

38. **Progne subis*. Common at Topeka, and abundant at Leavenworth, breeding in boxes provided for their use.

VIREONIDÆ.

39. **Vireo olivaceus*. Common.

40. *Vireo gilvus*. Common.

41. *Vireo flavifrons*. A single specimen was shot at Topeka, and several others were seen.

42. **Vireo noveboracensis*. Common.

43. **Vireo Belli*. Exceedingly abundant after May 15th at Topeka ; not seen earlier. Commenced pairing immediately after their arrival, and were one of the most numerous and conspicuous species of the smaller birds.

AMPELIDÆ.

44. **Ampelis cedrorum*. Several small roving flocks were seen at Topeka, May 20th and later.

LANIIDÆ.

45. **Collurio ludovicianus*. Said to be moderately frequent, but seen only at Leavenworth.*

* Messrs. Dresser and Sharpe, in a paper on "*Lanius excubitor* and its Allies" (Proc. Zool. Soc., 1870, p. 595), combine *C. excubitoroides* and *C. elegans* with *C. ludovicianus*, their conclusion being based upon an examination of specimens of each of these so-called species. I am glad to find my own opinion on this point (first partially expressed in Amer. Nat., 1869, p. 579, and more fully reiterated in Bull. Mus. Comp. Zool., Vol. II, p. 270, April, 1871) thus confirmed.

The original specimen of the *C. elegans* (*Lanius elegans* of Swainson), now in the British Museum, these gentlemen refer to the *L. lahtora* of Northeastern Africa and Asia, presuming the specimen to have come from some other locality than North America, or that the *L. lahtora* may occur in North America as a straggler from Northern Siberia. In this connection I may add that I have been long impressed with the close resemblance

ALAUDIDÆ.

46. * *Eremophila alpestris*. Common on the prairies.

FRINGILIDÆ.

47. * *Chrysomitris tristis*. Common.
48. * *Coturniculus passerinus*. Common.
49. * *Chondestes grammaca*. Moderately frequent.
50. *Zonotrichia leucophrys*. One specimen seen May 8th at Leavenworth.
51. *Zonotrichia querula*. Exceedingly abundant at Leavenworth. Found almost exclusively in the forests, and generally in company with *Z. albicollis*, which it resembles in habits and somewhat in song.
52. *Zonotrichia albicollis*. Common. Fully as numerous May 11th at Leavenworth as at any time previously. Less numerous at Topeka.
53. * *Spizella pusilla*. Common.
54. * *Spizella socialis*. Obtained one or two at Topeka still in immature plumage, — a condition in which I have never seen this species in the Northern States at this season of the year, although I have handled hundreds of specimens taken in spring at northern localities.
55. * *Spizella pallida*. Common at Topeka. Greatly resembles the specimens of *Spizella socialis* in immature plumage, taken at the same locality, with which they were associated.
56. *Melospiza melodia*. Not common. Only one specimen was observed.
57. *Melospiza palustris*. Not common.
58. *Melospiza Lincolnii*. Common.
59. * *Euspiza americana*. The males were excessively numerous, but only a few females were seen. Not yet breeding.
60. * *Goniaphea ludoviciana*. Only a few observed, which were nearly all males.
61. * *Cyanospiza cyanea*. Common. Not seen till May 8th, but was afterwards abundant. Both sexes unusually brightly colored. One of the females taken at Topeka had a strong shade of blue over the whole throat and breast, and other females were similarly more or less tinged with blue.
62. * *Cardinalis virginianus*. Exceedingly abundant. Young a week old were found May 10th. At the same date other nests were found containing three eggs each, as well as several unfinished nests. All of the

western specimens of *Collurio* (or *Lanius*) *ludovicianus* bear to certain forms of *Lanius* from Northern Africa. On recently comparing two specimens of shrikes, one from California and the other from Algeria, contained in the Lafresnaye collection in the Museum of the Boston Society of Natural History, I was unable to distinguish the Algerian one from the Californian.

half-dozen specimens of this species taken in Eastern Kansas differ from any I have seen from the Atlantic States in having a much larger and more swollen beak. It is a little smaller than that of the Cape St. Lucas form (*C. "igneus"*), in this respect being about half-way between the latter and the race of the Atlantic States. The color of the males is not quite so deep as in specimens from Florida.

63. * *Pipilo erythrophthalmus*. Abundant. Nests with eggs were found about May 6th and later. The song of this species was generally very different from that of the eastern bird, though occasionally it was indistinguishable from that of eastern individuals. Rather more white on the wings than in eastern specimens.

ICTERIDÆ.

64. * *Molothrus pecoris*. Very abundant. Generally seen lurking among the bushes in search of bird's nests in which to deposit its eggs. Plumage appreciably darker than at the north.

65. * *Agelæus phœniceus*. Common.

66. * *Xanthocephalus icterocephalus*. Several times seen around the prairie marshes at Topeka, where it was said to be common.

67. * *Sturnella ludoviciana*. Common. Several very pale-colored specimens were taken. It has here the song and generally the plumage of the so-called *S. neglecta*.*

68. * *Icterus Baltimore*. Common; chiefly frequenting the forests. The notes of the Baltimores here are very peculiar, many of them being entirely unlike any of those of their eastern representative.

69. * *Icterus spurius*. Abundant.

70. * *Quiscalus purpureus*. Abundant.

CORVIDÆ.

71. * *Corvus americanus*. Common. Young full grown taken at Topeka, May 23d.

* Dr. Otto Finsch, in the Proceedings of the Zoölogical Society (1870, p. 573), in speaking of the species of *Sturnella*, says: "The separation of the *Sturnelle* into five localized species, as Dr. Sclater endeavored to set forth (*Ibis*, 1861, p. 179), in which he was followed by Mr. Cassin (Proc. Ac. Phil., 1866, pp. 23, 24), seems to me to be inadmissible; nobody can distinguish the so-called species from the short diagnoses given as above cited. . . . Dr. Cabanis (J. f. Orn., 1856, p. 14, et 1861, p. 10), after having examined specimens from North America, Cuba, Costa Rica, Venezuela, and Guiana, comes to the conclusion that there is only one species; and I believe this opinion is quite right." These remarks of Dr. Finsch antedate by a few months my revision of this group published in April, 1871 (Bull. Mus. Comp. Zoöl., Vol. II, pp. 288-291), in which I came to the same conclusion. The part of the Proceedings of the Zoölogical Society containing Dr. Finsch's article had not then reached this country, and I am gratified to find that my own opinions on this point coincide with those of such high ornithological authorities.

72. * *Corvus corax*. Frequently seen; apparently common.

73. * *Cyanura cristata*. Abundant. One of the most numerous species met with. It has here a variety of notes I never noticed in the varied vocabulary of the representatives of this species elsewhere.

TYRANNIDÆ.

74. * *Tyrannus carolinensis*. Abundant.

75. * *Myiarchus crinitus*. Abundant.

76. * *Sayornis fuscus*. Common at Leavenworth. Darker colored than at the north.

77. * *Contopus virens*. Common.

78. * *Empidonax Traillii*. Not common.

79. *Empidonax minimus*. Not common.

ALCEDINIDÆ.

80. * *Ceryle alcyon*. Common.

CAPRIMULGIDÆ.

81. * *Chordeiles popetue*. Common.

82. * *Antrostomus vociferus*. A few heard at Leavenworth.

83. * *Antrostomus Nuttallii*. Common at Topeka.

CYPSELIDÆ.

84. * *Chætura pelasgia*. Abundant. Breeds chiefly in hollow trees.

PICIDÆ.

85. * *Picus pubescens*. Common. Darker colored than further north, in this respect resembling Florida specimens, and approaching the so-called *Picus* "*Gairdneri*" of the Rocky Mountains.

86. *Picus villosus*. Probably more or less common, but only one was observed.

87. * *Centurus carolinus*. Common. Those taken were very intensely colored. Some of the males had the whole throat bright red.

88. * *Melanerpes erythrocephalus*. Abundant.

89. * *Colaptes auratus*. Abundant. Several specimens were taken, with the black maxillary patch more or less tinged with red, through the mixture of red feathers with the black ones, thus already showing a tendency to the coloration of *C. mexicanus*, six hundred miles east of the habitat of that species.*

* Since the above was written, a specimen with red feathers in the black maxillary patch has been found in the Florida collection. I have also learned of the capture of a well-marked example of the so-called *C. "hybridus"* at Topeka, February 13, 1872, by Mr. O. S. George. Mr. Edwin A. Papenoe informs me that in this specimen the quills are "orange red," and that the feathers of the maxillary patch are tipped with "dark blood red," with the other characters nearly as in *C. auratus*.

ARIDÆ.

The *Conurus carolinensis*, Dr. C. A. Logan informed me, was formerly common here, but had not been recently observed.

FALCONIDÆ.

- 90. * *Falco spaverius*. Abundant.
- 91. * *Buteo borealis*. Common.
- 92. * *Buteo lineatus*. Common.
- 93. * *Circus cyaneus*, var. *hudsonius*. Common.
- 94. * *Nauclerus furcatus*. Several pairs seen at Topeka, where it arrived about May 15th.

CATHARTIDÆ.

- 95. * *Cathartes aura*. Common.

COLUMBIDÆ.

- 96. * *Zenædura carolinensis*. Abundant.

TETRAONIDÆ.

- 97. * *Cupidonia cupido*. Abundant on the prairies.

PERDICIDÆ.

- 98. * *Ortyx virginianus*. Abundant.

CHARADRIIDÆ.

- 99. * *Ægialitis vociferus*. Common.

SCOLOPACIDÆ.

- 100. *Actodromas maculata*. Common about the lagoons at Leavenworth.

- 101. *Ereunetes pusillus*. Common on the sand-bars in the Kaw River, at Topeka.

- 102. *Gambetta flavipes*. Numerous about the lagoons. Ova in the females quite large. Probably breeds. Males considerably darker than the females, with the transverse bars of black broader and much more conspicuous than in the females.

- 103. *Rhyacophilus solitarius*. Rather common. Probably breeds.

- 104. * *Tringoides macularius*. Abundant.

- 105. * *Actiturus Bartramius*. Common on the prairies.

- 106. *Limosa fedoa*. A few seen.

- 107. * *Numenius longirostris*. Common on the prairies.

GRUIDÆ.

- 108. *Grus americanus*. Two individuals were seen on a sand-bar in the Kaw River at Topeka.

ARDEIDÆ.

109. * *Ardea herodias*. One individual seen.
 110. * *Butorides virescens*. Common.
 111. * *Botaurus lentiginosus*. Common.

RALLIDÆ.

112. * *Fulica americana*. Common.
 113. * *Rallus virginianus*. Apparently common.
 114. * *Porzana carolina*. Probably common, though but few were seen.

ANATIDÆ.

115. * *Aix sponsa*. Common.
 116. * *Querquedula discors*. Abundant.
 117. * *Anas boschas*. Abundant.
 118. * *Fulix marila*. A single female was killed at Topeka, — the only representative of the species seen.
 Two other undetermined species of ducks were seen, but not taken.

PODICIPIDÆ.

119. *Podilymbus podiceps*. Common.

LARIDÆ.

120. * *Hydrochelidon fissipes*. Several seen.

PELECANIDÆ.

121. *Pelecanus erythrorhynchus*. Said to be common. Saw a specimen which was killed about May 10th, which had the crest on the upper mandible remarkably high and thick.

II. — *List of Birds observed in the Vicinity of Fort Hays, Kansas, from May 26 to July 3, 1871 ; with Annotations.*

THE subjoined list of sixty-one species of birds, observed in June at Fort Hays and vicinity, indicates the general character of the summer avian fauna of the eastern border of the Great Plains. The next following list of twenty-five species, observed during three weeks in midwinter, somewhat to the westward of Fort Hays, embraces all the more characteristic species of winter. Many not mentioned in these lists occur in fall and spring, chiefly swimming and wading birds.

Fort Hays is situated on Big Creek, three hundred miles west of the Missouri River, about ten south of the Saline River, and about the same distance north of the Smoky River. The timber here is not only

confined to the immediate vicinity of the streams, often to their beds, but generally occurs in thin, irregular belts or scattered clumps, and ceases entirely a few miles to the westward. The Smoky is already quite destitute of trees as far west as Fort Hays, and they soon disappear from the Saline. The observations on which the following notes are based are the result of about thirty-five days spent consecutively in the field, during which time an area of country of from fifteen to thirty miles' radius was quite thoroughly explored. The belt of timber along Big Creek, preserved on the Military Reservation at Fort Hays, afforded by far the richest field, though some species were obtained on the Saline, and during a single day's hunt on Big Timber Creek, that were not met with on Big Creek. A longer time spent on Big Timber would doubtless have added several other woodland species to the list here given. In further description of the locality, it may be added that the trees consist mainly of the white and red elms, the ash-leaved maple, cottonwoods, black-walnut, and ash. Most of these trees assume a spreading form, and grow to a large size. There is little undergrowth, except where the first growth has been removed, as it has been to a large extent on most of the streams within fifteen to twenty miles of the post. The undergrowth consists mainly of sumach, dwarf-plum, and *Amorpha fruticosa*. In proportion to the amount of timber, the tree-nesting species are very abundant, and their nests are easily found, frequently half a dozen pairs of nearly as many species breeding in a single tree.

The "Plains" are here, as usual, somewhat rolling broad level plateaus, being separated by low ridges, or broken by sharp ravines and moist hollows. They are covered with short grass, usually but two or three inches high, except in the hollows and near the streams, where it often grows to the height of one or two feet. On the plateaus and ridges, in consequence of the excessive heat and scanty fall of rain, the grass becomes parched and dry during the latter half of June, and for the rest of the year the landscape wears an arid and forbidding aspect, relieved only by the deep green foliage of the trees along the streams. During May and much of June, however, the fresh young grass is thickly dotted with a variety of showy flowers, which vary the landscape with their respective tints. They are mainly social plants, and, growing thickly, their bright colors are conspicuous, giving their several hues to large areas. Most characteristic among them are *Malvastrum*

coccineum, and one or two other malvaceous species, *Verbena aubletia*, a *Lippia*, a *Scutellaria*, and an aster-like composite plant, — all low forms and very prolific of large showy flowers. Among the coarser herbs are *Amorpha canescens*, *Echinacea angustifolia*, *Delphinium azureum*, a *Lepachys*, a *Dalea*, two species of *Linum*, *Onosmodium carolinianum*, and *Verbena hastata*, all common in their respective localities, but generally of dwarfed stature as compared with their size on the moister prairies to the eastward. The sensitive brier (*Schrankia uncinata*) was also abundant, and *Rosa lucida* was agreeably frequent along the streams. Two species of *Melocactus* and an *Opuntia* attest by their abundance the dryness of the climate.

The birds found here fall naturally into two groups, in accordance with the situations they most affect, — those of the timber and those of the Plains proper. The former class is much the more numerous in species, only about six being confined strictly to the Plains; these latter are, however, among the most characteristic, being by far the most numerous represented, and almost the only kinds that inhabit the treeless belt which extends thence westward to the Rocky Mountains. They are the horned lark (*Eremophila alpestris*), the chestnut-colored bunting (*Plectrophanes ornatus*), the lark finch (*Chondestes grammacus*), the lark bunting (*Calamospiza bicolor*), the yellow-winged sparrow (*Coturniculus passerinus*), and the meadow lark (*Sturnella ludoviciana*). The Carolina dove (*Zenaidura carolinensis*) and the night-hawk (*Chordeiles popetue*) are most numerous about the timber, but are also everywhere common on the open plains, where the dove nests on the ground as readily as it does in trees at the eastward. The killdeer and mountain plovers (*Ægialitis vociferus* and *Æ. montanus*), and Bartram's tattler or field plover (*Actiturus Bartramius*) frequent the plains, chiefly near moist hollows, as well as the neighborhood of streams. About one fifth of the species were strictly western, not regularly occurring east of the Missouri River. Several others, however, as *Chordeiles popetue*, *Sturnella ludoviciana*, *Peuceea æstivalis*, *Troglodytes aëdon*, etc., have received distinctive names, owing to the faded appearance they here exhibit, and others might be thus separated with equal propriety. The bleaching of the plumage is evidently the result of the excessive dryness of the climate, and the lack of shelter from the intense rays of the sun, and in some degree, perhaps, of the wearing off of the edges of the feathers by the almost incessant heavy winds.

During our five weeks stay at Fort Hays, the maximum daily temperature in the shade usually ranged from 90° to 108° F. This temperature is frequently accompanied by parching winds, especially later in the season. The most striking feature of the avian fauna here is the great abundance of more or less strictly woodland species, considering the scantiness of the forest vegetation.

TURDIDÆ.

1. *Harporthynchus rufus*. Common in the narrow timber belts which border the streams.

The habits of this species, in respect to the location of its nest, indicate how greatly it is governed by circumstances. In dry, sandy localities, it is well known to commonly nest on the ground, and to place its nest in low bushes, where the soil is damp and clayey. Along Big Creek, near Fort Hays, we found it nesting in low bushes, and also in trees sixteen to twenty feet from the ground. Big Creek is subject in summer to sudden freshets, the stream, flowing between abrupt banks, sometimes rising ten or twelve feet in a single night, half submerging the trees that grow along its narrow bed. It was under the latter circumstances that the nests of this species were found placed twenty feet above the ground, while but a few yards distant other nests were found in low bushes, the bushes, however, growing on the bluffs, several feet above high-water mark. Other species that generally nest near the ground were also found to place their nests at a similar elevation, when breeding in the trees that grew along the bed of Big Creek. The several species seemed to be well aware of the peculiarities of the stream, and hence placed their nests above the high-water line.

2. *Mimus polyglottus*. Common in the timber along Big Creek. Nest placed in trees fifteen feet from the ground. Fresh eggs obtained June 6th.

3. *Mimus carolinensis*. One or two seen on Big Timber Creek. Not common.

SAXICOLIDÆ.

4. *Sialia sialis*. Not uncommon along the timbered streams.

PARIDÆ.

5. *Parus atricapillus*. Frequent in the timber along the streams.

TROGLODYTIDÆ.

6. *Troglodytes ædon*. Abundant, nesting in the hollows of trees. Seven fresh eggs taken from one nest June 7th.

In respect to plumage, this species has here all the essential characters of the so-called *T. "Parkmanni,"* the colors being appreciably paler than in specimens from the Atlantic States.

SYLVICOLIDÆ.

7. *Icteria virens*. Common on Big Timber Creek.

Probably *Dendræca æstiva* and *D. discolor* occur sparsely along the Big Timber, but none were observed during a day's hunt along that stream.

HIRUNDINIDÆ.

8. *Hirundo lunifrons*. Common at localities. Large colonies breed on the cliffs bordering the Saline River.

9. *Cotyle serripennis*. Not uncommon along the streams, in the banks of which it nests. Nests examined June 7th were not yet completed.

10. *Progne subis*. A few pairs were seen in the vicinity of Fort Hays, where they were breeding in boxes erected for their accommodation.

VIREONIDÆ.

11. *Vireo gilvus*. Rather common in the timber on the "Reservation" at Fort Hays, and along the Saline and Big Timber.

12. *Vireo Belli*. Common along Big Timber, and doubtless more or less frequent along the better timbered portions of the other streams.

ALAUDIDÆ.

13. *Eremophila alpestris*. Abundant; as frequent on the high divides as elsewhere. Very unsuspicious; in this regard its habits contrasting strongly with those of most of the other prairie species, especially *Calamospiza bicolor* and *Plectrophanes ornatus*. It was decidedly the most numerous species in the vicinity of Fort Hays. Resident, breeding very early, and apparently twice in the season. The first brood was fully fledged in May, and before the end of June the young birds were already gathering into flocks. June 11th, we found young in the nest half grown, and the following day young that, although they had left the nest, were still unable to fly. No nests were found containing eggs, the species being a close sitter, and the nest very difficult to find.

The plumage of this species was very much bleached, a large proportion of the specimens observed having the throat either distinctly white, as also the superciliary stripes, or with only the faintest trace of yellow, and the other tints were correspondingly pale.

FRINGILLIDÆ.

14. *Chrysomitris* sp.? A *Chrysomitris* was frequently heard, but all our efforts to procure a specimen were fruitless. It had the restless habits and the notes of *C. pinus*, but this species is not known to frequent so southern a locality in the breeding season. It is hence more likely to have been *C. psaltria*.

15. *Plectrophanes ornatus*. Common out on the plains almost every-

where, it being one of the most interesting and characteristic species of the Plains. It has a short, shrill, but very sweet song, which is often uttered while on the wing. It is very wary for so small a bird, and has the habit of circling round the observer when disturbed for several minutes together, approaching tantalizingly near, with feints of a nearer approach, but generally keeping well out of range. The nest is a very neat, though slight structure, placed of course on the ground, and is composed of dry fine grass and rootlets. The eggs are generally five, blotched and streaked with rusty on a white ground. Full sets of freshly laid eggs were first found about June 3d.

The plumage varies greatly in color in different individuals of even the same sex, the variation being generally in respect to the purity and intensity of the colors. The most highly colored males have the breast and middle of the abdomen more or less strongly tinged with very bright ferruginous; others have these parts pure black; while in others still the black is obscured by the feathers having brownish-white margins. The lesser coverts vary from gray to black. The red tinge on the abdomen seems merely indicative of a high state of plumage; those thus marked also having the lesser coverts black; but they are also black in some specimens that are not tinged with red. *Plectrophanes melanomus* Baird, is merely the ferruginous phase of this species, and not even a local race. The highest colored female (the sex determined by dissection) was nearly as brightly colored as the paler colored males, having the chestnut collar, and the black on the breast nearly as distinct as some of the males. It was also nearly as large, and, until dissected, was supposed to be an immature male. Thirty specimens of the bird were obtained, and three full sets of eggs.

16. **Coturniculus passerinus.** Abundant everywhere on the Plains. Several nests, with full sets of (usually five) fresh eggs were found between June 3d and 10th. In notes and habits it does not differ from the eastern birds, but is paler colored.

On comparing Florida specimens (of which I have thirty before me, from Miami, Florida, collected by Messrs. Maynard and Henshaw) with northern ones, the former are found to be far more brightly colored than the latter. Between northern and southern specimens of the same species greater differences in color are rarely observable than in this, the differences being far greater than occur between many conspecific geographical races to which has been awarded specific rank. The difference consists in the much brighter and blacker tints of the southern form. Massachusetts specimens, though lighter than Florida ones, are still much darker than those from the Plains.

17. **Chondestes grammaca.** Common. Most numerous in the moist ravines and near the streams. Forms a very slight nest on the ground,

about June 1st. The first full set of eggs was found June 3d, and in one instance half-grown young were found June 6th. Generally, however, they appeared to commence laying about June 5th. Quite unsuspicious, and has the most elaborate song of any bird on the Plains.

18. *Peucaea aestivalis*, var. *Cassinii*. Rather common along the streams, where its low but peculiarly sweet song is heard at morning and evening, beginning with the first approach of dawn, and continuing at evening considerably after nightfall. It is very retiring, and it was only after several attempts that I discovered the author of the sweet notes that at these still hours added greatly to the pleasures of camping on the plains. The plumage is very much paler than that of Florida specimens, agreeing with that of the so-called *P. "Cassinii."*

19. *Calamospiza bicolor*. Common here and there on the plains, living apparently in scattered colonies. Females were obtained from June 5th to 10th, that had evidently commenced incubation, but our long searches for the nest of this species proved always fruitless. The birds are very wary and difficult to shoot. Like most birds of the Plains, they are very tenacious of life, and when shot through vital parts, will generally fly several hundred yards before falling, finally dropping dead. It is a bird of powerful flight, delighting in the strongest gales, which force most other species to lie sheltered in the grass. It has habits that strongly recall the yellow-breasted chat, singing generally on the wing, hovering in the same manner as that bird, while its notes are so similar to those of the chat as to be scarcely distinguishable from them. Hence while collecting, we naturally applied to it the cognomen of the "Black Chat." The plumage of the males varies considerably in color, some being entirely black, except the white wing-patches, while others have the plumage more or less skirted with brownish-white, and in others there is an intermixture of feathers wholly brownish. After the moulting season the males assume the plumage of the female, the change in color being similar to that of the males of *Dolichonyx oryzivora*.

20. *Euspiza americana*. Abundant on Big Timber Creek, and some were seen along the Saline.

21. *Goniaphea melanocephala*. Several pairs seen along Big Creek near Fort Hays. A nest with half-grown young was obtained June 11th. Another nest built by the same pair was found with eggs about June 27th. The song of this species so much resembles that of *G. ludoviciana* that at first we mistook the species for that bird, and were only undeceived by shooting specimens.

No representatives of the genera *Cyanospiza*, *Spizella*, or *Melospiza* were observed during our five weeks' stay at this locality.

ICTERIDÆ.

22. *Molothrus pecoris*. Common in the timber, and frequent on the plains ten to fifteen miles from the nearest trees.

23. *Xanthocephalus icterocephalus*. A small flock seen at intervals about the corral at Fort Hays during our whole stay there. They probably bred in the vicinity.

24. *Quiscalus purpureus*. Abundant along Big Creek at Fort Hays. Nests with newly hatched young were found June 1st, and others with fresh eggs as late as June 12th. A nest was found in an old woodpecker's hole, the top of which had been broken off, June 8th, containing two eggs, and two young just hatched. A few twigs and rootlets had been laid on the rotten wood to serve for a nest. Mr. William Brewster informs me he has known this species to breed in a woodpecker's hole in Maine, — a rather strange departure from its usual habits, considering its long tail, which would seem to be an impediment to such a mode of nesting.

25. *Icterus Baltimore*. Common in the timber. All the specimens obtained on Big Creek had much more white on the edges of the quills than eastern birds, the middle coverts in the males being entirely white or only faintly stained with yellow, instead of deep yellow or orange as in the eastern birds. The specimens of this bird collected at Topeka and Leavenworth are in this respect about half-way between the Fort Hays specimens and those from the Eastern States. All the Kansas specimens are smaller than average New England ones, and have the bill relatively longer, slenderer, and more decurved. The females were also uniformly without black on the throat and head.

26. *Icterus spurius*. Abundant in the timber on the Reservation at Fort Hays. Full sets of fresh eggs were taken every day from June 6th to 10th.

27. *Sturnella ludoviciana*, var. *neglecta*. Abundant. The eight specimens taken were all very pale, or of the *S. neglecta* type. Song shorter, the notes more guttural and less ringing than those of this bird are on the prairies of Iowa, Northern Missouri, and Eastern Kansas, over which regions the *neglecta* type of plumage also prevails. A single nest found May 30th. It was open at the top, and rather slovenly made.

CORVIDÆ.

28. *Corvus corax*. Only a few pairs seen, though reputed to be common.

29. *Cyanura cristata*. Abundant in the timber.

TYRANNIDÆ.

30. *Tyrannus carolinensis*. Abundant in the vicinity of the timbered streams.

31. *Tyrannus verticalis*. Very numerous along the timbered streams. It has much the same habits as the *T. carolinensis*, nesting in the same manner. The eggs are so much like those of that bird, that they are sometimes actually indistinguishable from them. Nests with fresh eggs obtained June 4th to 10th.

32. *Myiarchus crinitus*. One specimen obtained, which was the only one seen.

No species of *Empidonax*, *Sayornis*, or *Contopus* was observed.

ALCEDINIDÆ.

33. *Ceryle alcyon*. Common.

CUCULIDÆ.

34. *Coccygus americanus*. Common.

PICIDÆ.

35. *Picus pubescens*. A single individual seen.

36. *Melanerpes erythrocephalus*. Abundant wherever there was timber, and no less inquisitive and irrepressible than at the East.

37. *Colaptes auratus*. Rather rare, and very wary. One was several times seen at a distance that seemed nearly red enough to be *C. mexicanus*. Those taken had red in the cheek-patches, as at Leavenworth.

CAPRIMULGIDÆ.

38. *Chordeiles popetue*. Abundant. Most of those taken were very light colored, corresponding with the so-called *C. "Henryi,"* but some were nearly as dark as the average eastern bird.*

STRIGIDÆ.

39. *Bubo virginianus*. Not seen alive, but a dried carcass was found near Fort Hays.

40. *Athene hypogæa*. A large colony observed near the post, and several small colonies elsewhere, living in the burrows of the prairie-dogs (*Cynomys ludovicianus*).

Different specimens vary greatly in color and in the amount of feathering on the feet. Some have the tarsi densely feathered, while in other specimens the tarsi are nearly bare, a large series presenting every degree of variation between these extremes. The *A. hypogæa*, formerly supposed to be confined to the region east of the Rocky Mountains, as distinguished from the *A. "cunicularia"* of the western half of the continent, seems to have been based on specimens with the tarsi quite fully clothed, and hence

* In the synonymy of *C. popetue* given in Bull. Mus. Comp. Zoöl., Vol. II, page 300, foot-note, *C. texensis* was inadvertently included.

mainly on individual variation of this character. The Rocky Mountain form, to which the name of *cunicularia* has generally been restricted, is a little larger than the birds from the Plains, their elevated habitat corresponding to a more northern locality. Specimens were collected the past summer at intervals from Fort Hays to the Salt Lake Basin. After a comparison of these with authentic specimens of both *A. "cunicularia"* and *A. hypogaea* of authors, I find no difference that is constant, except the rather larger size of the Rocky Mountain form, — a difference that would *a priori* be expected.

FALCONIDÆ.

41. *Falco peregrinus*. A pair of these birds were found breeding on a high cliff near the Saline River, May 29th, the young being then half grown. The nest was placed on an inaccessible shelf of the cliff, and was composed of sticks. The only other instance that has come to my knowledge in which this bird has used any other nest than the bare ground is that mentioned recently by the Rev. William Jarvis in the "American Naturalist,"* where he speaks of a nest found by him in the White Mountains, which was "made of a few dry sticks placed round a hollow on a shelf of the cliff."

42. *Falco sparverius*. A few pairs observed nesting in hollow trees.

43. *Buteo borealis*. A few pairs seen, and a nest found June 1st, containing three fresh eggs.

44. *Circus cyaneus*, var. *hudsonius*. Rather common.

CATHARTIDÆ.

45. *Cathartes aura*. Moderately common. Usually seen in small parties of from three or four to a dozen, about the carcasses of recently killed buffaloes. A considerable number were apparently breeding in the vicinity of some high cliffs on the Saline, but a careful search for their nests was unsuccessful.

COLUMBIDÆ.

46. *Zenædura carolinensis*. Common everywhere, but most numerous in the vicinity of timber. Very commonly met with in pairs, many miles from the nearest timber. Many nests were found at Fort Hays, in the timber along Big Creek. Most of them were built in the usual way, forming such slight structures that the eggs could be readily seen through them from the ground. Several pairs, however, were found occupying deserted nests of the purple grackle, which they had slightly repaired. In one case a nest with two eggs was found *on the ground*, only a few yards from shrubs. From the frequency with which I had seen pairs of these birds far out on the plains in the nesting season, I was led to anticipate this method

* Am. Nat., Vol. V, p. 662.

of breeding. I afterwards learned that further west, where the prairies were entirely destitute of timber, and where this bird was very common, they always nested on the ground, as from necessity of course they must. The fact, however, is interesting as showing how readily the bird greatly modifies its breeding habits to suit its surroundings, while other tree-nesting species disappear entirely in regions where there are no trees. The present species, however, seems everywhere but slightly dependent upon trees, as it seeks its food in fields, and not in forests.*

MELEAGRIDÆ.

47. *Meleagris gallopavo*. Common along the timbered portions of the streams, which here form its western limit.

TETRAONIDÆ.

48. *Cupidonia cupido*. Rare. It is every year, however, advancing westward. Was first seen in the vicinity of Fort Hays about two years since, and is apparently fast becoming common.

49. *Pediœcetes phasianellus*, var. *columbianus*. Common along the streams. It is here called the "grouse," in distinction from the prairie-hen; but further west, beyond the range of the true prairie-hen, it is almost universally called "prairie-hen" or "prairie-chicken."

PERDICIDÆ.

50. *Ortyx virginianus*. Occasional, but every year is becoming more common. Like the prairie-hen, it is quite rapidly working westward, following the settlers.

CHARADRIIDÆ.

51. *Ægialitis vociferus*. Common everywhere. To the collector an unmitigated nuisance, from their incessant screaming about his head wherever he goes.

52. *Ægialitis montanus*. Moderately common. Unlike the preceding species, they are quite unsuspicious and retiring, and nearly always silent.

SCOLOPACIDÆ.

53. *Tringoides macularius*. Common.

54. *Actiturus Bartramius*. Not common.

55. *Numenius longirostris*. A few pairs were observed near Fort Hays, where they were breeding.

56. *Numenius hudsonicus*. A single specimen was seen and shot June 15th.

* Since the above was written I have been informed by Professor O. C. Marsh that he has often found the eggs and young of this species on the ground in Western Kansas and in Colorado. He says (in a letter): "Once I flushed a female who was covering a couple of very young birds on the ground, not in a nest, but in a small depression *on the ground*."

ARDEIDÆ.

57. *Butorides virescens*. Occasional.

58. *Nyctiardea grisea*, var. *nævia*. A single specimen was seen flying along Big Creek.

RALLIDÆ.

59. *Fulica americana*. A single specimen was shot June 8th. Said, however, to be common.

ANATIDÆ.

60. *Aix sponsa*. Not common.

61. *Querquedula discors*. More or less frequent throughout the summer.

III. *List of Birds observed in Northwestern Kansas, December 25, 1871, to January 12, 1872; with Annotations.*

THE following list is based on observations covering a period of nearly three weeks, made during a wagon journey of over two hundred and fifty miles. The area traversed was nearly fifty miles square, extending westward from Park's Fort Station, on the Kansas Pacific Railway, to Grinnell, and from the Smoky River on the south to the head-waters of the Solomon on the north. The opportunity was hence unusually favorable for observing the birds that inhabit the Plains in winter.

The locality does not differ essentially from the country about Fort Hays, except in the greater scarcity of timber, which is limited to a few scanty clumps of bushes and scattered trees on the Saline and Solomon Forks, opposite Coyote Station. The small number of species observed under such favorable circumstances indicates the poverty of the winter avian fauna of the Plains. The only species really numerous were *Eremophila alpestris*, which was met with everywhere, and roving flocks of two species of *Plectrophanes* (*P. nivalis* and *P. Maccownii*). As our halts near the timber were necessarily short, a longer stay at these points might have added a few other species to the list of those observed.

PARIDÆ.

1. *Parus atricapillus*. A few were seen in the shrubs along the streams.

ALAUDIDÆ.

2. *Eremophila alpestris*. Abundant everywhere, but especially numerous along the railroad and near the settlements. Though so numerous, they appeared to suffer considerably from the unusual severity of the winter, as they were frequently found frozen. A number were also obtained that had maimed themselves by flying against the telegraph-wires at Coyote Station.

FRINGILLIDÆ.

3. *Chrysomitris tristis*. One small flock seen.

4. *Plectrophanes nivalis*. Flocks, sometimes of large size, were seen wheeling about over the plains nearly every day, in their usual restless manner.

5. *Plectrophanes Maccownii*. Common in small flocks. Easily approached, and far less erratic in their movements than the preceding species.

6. *Plectrophanes ornatus*. More or less frequent in small flocks, but far less numerous than the preceding, or than they were in summer at Fort Hays.

7. *Spizella monticola*. Frequent along the wooded parts of the streams.

CORVIDÆ.

8. *Corvus corax*. Four or five were seen feeding on some buffalo carcasses on the divide between the North and South Forks of the Solomon, fifteen miles from the nearest timber.

ALCEDINIDÆ.

9. *Ceryle alcyon*. One was seen on the Saline, north of Coyote Station.

PICIDÆ.

10. *Picus pubescens*. One was seen in some timber on the Saline, and one on Big Creek, near Fort Hays.

11. *Colaptes auratus*. Two were observed on the Saline, north of Coyote Station.

FALCONIDÆ.

12. *Falco peregrinus*. Not common.

13. *Falco columbarius*. Occasional.

14. *Astur atricapillus*. A single individual observed.

15. *Buteo lineatus*. Frequent.

16. *Archibuteo lagopus*. Common. Most numerous of the rapacious birds.

17. *Aquila chrysaëtos*. Frequent.

18. *Haliaëtus leucocephalus*. Common.

19. *Circus cyaneus*, var. *hudsonius*. A single individual seen.

STRIGIDÆ.

20.? *Otus* "*Wilsonianus*." An owl was heard at one of our camps on the Solomon, supposed to be of this species.

21. *Athene hypogæa*. Several were seen just at nightfall near Buffalo Station. Said to be more or less frequently observed in mild weather throughout the winter.

MELEAGRIDÆ.

22. *Meleagris gallopavo*. Said to be common on the streams as far west as the timber extends.

TETRAONIDÆ.

23. *Cupidonia cupido*. A few occur as far west as Coyote, where they have recently made their appearance from the east.

24. *Pedicæetes phasianellus*, var. *columbianus*. Common along the streams.

PERDICIDÆ.

25. *Ortyx virginianus*. Not yet common west of Fort Hays, though said to have been observed at Coyote.

IV. *List of Birds observed at Cheyenne, Wyoming Territory, from August 16 to August 28, 1871; with Annotations.*

CHEYENNE, from its situation in the midst of the Plains, forms a locality possessing peculiar interest ornithologically. Its elevation above the level of the sea is said to be 6,041 feet. The nearest timber is twenty miles distant, but along the bed of Crow Creek — a small stream near the town, consisting, at this season, of little more than a chain of slight pools — were scattered clumps of rose-bushes and low willows. The latter were rarely more than three to six feet in height, grew very much scattered, and were nearly destitute of foliage, their leaves having been devoured by cattle. Although but forty-one species were obtained or observed here, it is probable that even a number considerably less than this would include all that regularly breed here. The abundance of the *Tyrannidæ* found here at this season is one of the most interesting ornithological features of the locality, since they would hardly be expected in very great number or variety at points so remote from timber. Although the greater part were young birds, and may have come from woodlands, probably the greater number and per-

haps all the commonly wood-inhabiting species enumerated below, breed sparingly among the low willows that grow along Crow Creek.

TROGLODYTIDÆ.

1. *Troglodytes ædon*. Frequent.

SYLVICOLIDÆ.

2. *Dendrœca æstiva*. Two or three specimens obtained. Not common.

3. *Wilsonia pusilla*. Several specimens obtained. Rather more frequent than the last.

4. *Icteria virens*. One specimen obtained, which was the only one seen.

HIRUNDINIDÆ.

5. *Hirundo horreorum*. Frequent near the town.

6. *Hirundo lunifrons*. Moderately common.

LANIIDÆ.

7. *Collurio ludovicianus*. Moderately common.

ALAUDIDÆ.

8. *Eremophila alpestris*. Common.

FRINGILLIDÆ.

9. *Chrysomitris tristis*. Several small flocks seen flying over.

10. *Plectrophanes Maccownii*. Abundant. In its notes and mode of flight not readily distinguishable from *P. ornatus*, for which species we at first mistook it. The latter was not observed at this locality.

11. *Chondestes grammaca*. Common.

12. *Poœcetes gramineus*. Abundant. All the specimens obtained were very palely colored, the young of the year as well as the adult.

13. *Passerculus savanna*. Common.

14. *Spizella socialis*. Abundant. Very faintly colored, the young especially, and hardly distinguishable from *S. pallida*.

15. *Spizella pallida*. Common.

16. *Spizella pusilla*. Common.

17. *Calamospiza bicolor*. Common.

18. *Cyanospiza amœna*. Not common.

19. *Goniaphea melanocephala*. Not common.

ICTERIDÆ.

20. *Molothrus pecoris*. Rather common, associating with *Xanthocephalus icterocephalus*.

21. *Xanthocephalus icterocephalus*. Several small flocks met with along Crow Creek.

22. *Sturnella ludoviciana*, var. *neglecta*. Abundant.

23. *Icterus Baltimore*. Frequent. Only young birds seen, which were very palely colored.

TYRANNIDÆ.

24. *Tyrannus carolinensis*. One specimen obtained, and a few others seen.

25. *Tyrannus verticalis*. Very abundant, and somewhat gregarious. Chiefly young birds seen, associating in loose flocks of several dozens. Kept exclusively in the valley of Crow Creek.

26. *Contopus virens*, var. *Richardsonii*. Common.

27. *Sayornis Sayus*. Common.

28. *Empidonax flaviventris*, var. *difficilis*. Common.

TROCHILIDÆ.

29. *Selasphorus platycercus*. Common.

STRIGIDÆ.

30. *Athene hypogæa*. One small colony observed.

FALCONIDÆ.

31. *Falco peregrinus*. A single individual was seen August 20th.

32. *Falco sparverius*. Common.

33. *Buteo* sp.? A very light colored large species of *Buteo* was common, but none were obtained.

34. *Circus cyaneus*, var. *hudsonius*. Abundant. Nearly all seen were birds of the year, in which the plumage was very red, much more so than in eastern specimens of corresponding age.

CATHARTIDÆ.

35. *Cathartes aura*. Frequent. Six were seen at one time feeding on the carcass of a dog.

COLUMBIDÆ.

36. *Zenædura carolinensis*. Common.

CHARADRIIDÆ.

37. *Ægialitis vociferus*. Common.

SCOLOPACIDÆ.

38. *Actodromas Bairdii*. Common along Crow Creek.

39. *Actodromas minutilla*. Common along Crow Creek.

40. *Rhyacophilus solitarius*. Common with the preceding.

RALLIDÆ.

41. *Porzana carolina*. A single individual observed. Probably not frequent.

V. *List of Birds observed at the Eastern Base of the Rocky Mountains in Colorado Territory, between Colorado City and Denver, in July and August,* 1871; with Annotations.*

THE list given below is based on observations made on a journey from Colorado City to Denver, during the first two weeks of August, supplemented by a few notes made at Denver during the first week of July. Probably five sixths of the species breed at the localities where they were observed. Four days were spent in the neighborhood of Colorado City, two at Lake Pass, and about ten days at Denver. The distance between Colorado City and Denver is nearly one hundred miles. The highest point is at Lake Pass, on the divide between the Arkansas and South Platte Rivers, which is said to be about 7,000 feet above the sea. Though really on the Plains, our road passed quite near the foot-hills, and along the streams there was considerable timber. We found here, as would be naturally anticipated, a fauna in many respects peculiar, — a blending of that of the mountains with that of the Plains. Most of the species found on the Plains extend to the foot-hills, and even into the valleys between them. On the other hand, many, belonging properly to the wooded region of the mountains, follow the timber belts along the streams for some distance into the Plains. We hence have here a far richer bird fauna, through the addition of the mountain species, than is met with on the Plains proper.

TURDIDÆ.

1. *Turdus migratorius*. Tolerably common, especially along the creeks in the foot-hills.

2. *Turdus Pallasi*. Only observed on Monument Creek, at Lake Pass; altitude of the locality about 7,000 feet.

3. *Oreoscoptes montanus*. Common on Dry Creek, ten miles south of Denver.

4. *Mimus carolinensis*. Common along the Fontaine-qui-bouit, near Colorado City. Also seen in the Garden of the Gods, at Lake Pass, at Denver, and on Bear Creek, about fifteen miles southwest of Denver, behind the first foot-hills.

5. *Harporhynchus rufus*. Observed near Colorado City, and obtained on Bear Creek, in the foot-hills southwest of Denver.

* From July 4th to 8th, and August 1st to 13th.

CINCLIDÆ.

6. *Cinclus mexicanus*. Seen on the Fontaine-qui-bouit, at Colorado City, August 1st.

SAXICOLIDÆ.

7. *Sialia mexicana*. One pair observed in the foot-hills west of Denver. There is also a specimen in the Museum, collected near Denver. It is from the late Mr. Cassin's collection, and bears the following label: "*Sialia mexicana*, Clear Creek, Rocky Mts., K. T., July, 1859. W. S. Wood, Jr."

8. *Sialia arctica*. Many seen, and three shot, a few miles north of Colorado City.

SITTIDÆ.

9. *Sitta carolinensis*. A single specimen was seen about twenty miles north of Colorado City, on the Monument.

TROGLODYTIDÆ.

10. *Salpinctes obsoletus*. Obtained in the foot-hills southwest of Denver, on Bear Creek.

11. *Catherpes mexicanus*. Common in the Garden of the Gods, near Colorado City. Seen only on the bare rocks. The vertical sandstone cliffs of the Garden of the Gods seemed to afford them a favorite haunt, over which they flitted to the highest points of the naked cliffs. Their shrill, ringing notes reverberated among the cliffs with almost incredible loudness, it seeming almost impossible that so small a bird should be able to produce such penetrating and startling echoes.

12. *Troglodytes ædon*. Common everywhere.

A bird supposed to be *Chamæa fasciata* was observed in the foot-hills near Colorado City. Although no specimens were obtained, it was several times seen, and watched at a distance of only a few yards, and I feel confident it was that species, though previously known only from localities as distant as Lower California.

SYLVICOLIDÆ.

13. *Icteria virens*. Common near Colorado City, and also observed near Denver.

14. *Dendræca Auduboni*. Common along the streams at the foot of the mountains from Colorado City to Denver. Properly a bird of the mountain fauna.

15. *Dendræca æstiva*. Occasional from Colorado City to Denver.

16. *Setophaga ruticilla*. Common in the foot-hills west of Denver, the first week in July, and also seen at Colorado City.

HIRUNDINIDÆ.

17. *Hirundo horreorum*. Generally dispersed, but not numerous.

18. *Hirundo lunifrons*. Abundant at Denver, common at Colorado City, and frequently seen between these points.

19. *Hirundo thalassina*. Common at the Garden of the Gods, and about Castle Rock, at Lake Pass, *breeding in holes in the rocks*, instead of in hollow trees, as is its usual custom.

20. *Cotyle serripennis*. A few seen along the South Platte at Denver.

VIREONIDÆ.

21. *Vireo gilvus*, var. *Swainsoni*. One was shot on Kettle Creek, near its junction with the Monument, where also others were seen. Paler than eastern specimens, and pertaining to *V. Swainsoni* Baird, which may be recognized as the western paler race of *V. gilvus*.

22. *Vireo solitarius*, var. *plumbeus*. Two shot at the same locality as the last, the only point where they were met with. Paler than eastern specimens, with barely a trace of olive above and on the sides, but appears to be merely the pale western race of *V. solitarius*. Other specimens are in the Museum of Comparative Zoölogy from Colorado.

LANIIDÆ.

23. *Collurio ludovicianus*. Rather common in the vicinity of Denver.

TANAGRIDÆ.

24. *Pyrranga ludoviciana*. A single specimen was shot near Colorado City, the only one seen.

ALAUDIDÆ.

25. *Eremophila alpestris*. Common.

FRINGILLIDÆ.

26. *Chrysomitris tristis*. Common at Denver and Colorado City, and seen at intervals between these points.

27. *Chrysomitris pinus*. Common at the Soda Springs, near Colorado City, in August, and also observed near Denver. Probably breeds in the mountains, which are here but a few miles distant.

28. *Chondestes grammacus*. Common. Occasionally seen in considerable flocks in company with *Calamospiza bicolor*.

29. *Poœcetes gramineus*. Common.

30. *Spizella socialis*. Common. Seen in large flocks the first week in August.

31. *Spizella pallida*. More or less frequent, associating with *S. socialis*, from which, in nestling plumage, it is scarcely distinguishable.

32. *Melospiza melodia*. A few observed near Colorado City.

33. *Calamospiza bicolor*. Abundant. Moulting the first week in August, when the males were curiously mottled with irregular patches of brown and black.

34. *Euspiza americana*. Frequent near Colorado City.

35. *Goniaphea melanocephala*. Observed at Colorado City and at Denver.

36. **Cyanospiza amœna**. Common at Colorado City, and also observed at Denver. Common in the foot-hills southwest of Denver.

37. **Pipilo erythrophthalmus**, var. **oregonus**. Numerous among the foot-hills, and more or less frequent along the streams for ten or twenty miles to the eastward.

38. **Pipilo chlorurus**. Common along the streams to some distance east of the foot-hills, though it probably breeds only in the mountains.

ICTERIDÆ.

39. **Molothrus pecoris**. More or less frequent.

40. **Agelæus phœniceus**. Common about Denver.

41. **Sturnella ludoviciana**, var. **neglecta**. Abundant.

42. **Icterus Baltimore**. Moderately common along the timbered streams. All the specimens examined presented an exceedingly bleached and weathered appearance.

43. **Icterus spurius**. Common in the vicinity of Denver.

44. **Scolecophagus cyanocephalus**. Common near the streams.

CORVIDÆ.

45. **Corvus corax**. Common along the Platte near Denver, and observed at intervals along Plum Creek.

46. **Pica caudata**, var. **hudsonica**. Seen at intervals along the streams.

47. **Cyanurus Stelleri**, var. **macrolophus**. The form called *macrolophus* was common along the streams.

48. **Aphelocoma floridana**, var. **Woodhousei**. A single pair was obtained near Colorado City, the only individuals seen.

49. ? **Picicorvus columbianus**. A small party, probably of this species, seen near Colorado City, but no specimens were obtained. This is the species already referred to as a probably undescribed species of woodpecker.* The colors of this species correspond very closely with the supposed woodpecker, and having since learned that the habits of *Picicorvus columbianus* so closely resembles those of *Melanerpes torquatus* as to render it easily mistaken for a woodpecker, it seems more probable that it may have been this bird than that a large species of woodpecker inhabiting this region should have thus far been overlooked.

TYRANNIDÆ.

50. **Tyrannus carolinensis**. Moderately frequent from the Soda Springs northward to Denver, ranging to the base of the mountains.

51. **Tyrannus verticalis**. Common at Denver, and occasionally southward to Colorado City. Not seen in the mountains, nor in South Park.

* Am. Nat., Vol. VI, p. 350.

52. *Contopus virens*, var. *Richardsoni*. Tolerably frequent.

53. *Sayornis Sayus*. A single individual shot near Colorado City, and one other seen.

54. *Empidonax obscurus*. More or less frequent in the bushes along the streams.

ALCEDINIDÆ.

55. *Ceryle alcyon*. Seen occasionally along most of the creeks.

CAPRIMULGIDÆ.

56. *Antrostomus Nuttallii*. Heard great numbers at our camp near the Garden of the Gods.

57. *Chordeiles popetue*. The paler form, called "*Henryi*," of this species was everywhere common.

CYPSELIDÆ.

58. *Panyptila melanoleuca*. Observed only at the Garden of the Gods, where many pairs were breeding, though sought for at Castle Rocks and other similar places. They breed in holes and crevices in the rocks, usually far above gun-shot. They seemed very shy, and flew mostly near the tops of the highest rocks. Upon ascending the rocks most frequented by them they moved to other points, and thus managed to keep generally out of range. By spending a considerable part of two days, we procured only four specimens, though several others were killed, which fell in inaccessible places. They fly with great velocity and are very tenacious of life. As they swoop down to enter their nests, the rushing sound produced by their wings can be heard to a considerable distance. *Hirundo thalassina* was also breeding here in similar situations.

TROCHILIDÆ.

59. *Selasphorus platycercus*. Common and quite generally distributed.

PICIDÆ.

60. *Picus villosus*, var. *Harrisii*. Shot a single specimen at the Garden of the Gods.

61. *Melanerpes erythrocephalus*. Common at Denver, and frequent southward along Plum Creek and elsewhere where there were many trees.

62. *Melanerpes torquatus*. First seen at Monument Park. Common in the timber along Plum Creek.

63. *Colaptes mexicanus*. Common.

STRIGIDÆ.

64. *Athene hypogæa*. Common near Denver, and also seen near Blake's Mills, on Plum Creek.

FALCONIDÆ.

65. *Falco peregrinus*. Seen at the Garden of the Gods, Castle Rocks, and on Bear Creek, in the foot-hills southwest of Denver.

66. *Falco sparverius*. Abundant everywhere. Very numerous in the Garden of the Gods, *where they appear to nest in holes in the rocks*. The old birds were seen to enter holes in the cliffs, and several broods of newly fledged young seen there were evidently raised in the vicinity, although there were no trees within several miles in which they could have nested. The remarkable pinnacles of rock, rising vertically to a height of from 100 to 300 feet, which occur at this point, abound in holes admirably suited for nesting-sites for these and other birds, while the only timber in the vicinity consists of dwarfed piñons, pines, and cedars, with here and there a cotton-wood along the neighboring creek.

67. *Buteo borealis*. A large red-tailed hawk was frequent everywhere between Colorado City and Denver.

68. *Circus cyaneus*, var. *hudsonius*. Common and generally dispersed. Next to the sparrow-hawk, the most numerous species of *Falconidæ* observed.

CATHARTIDÆ.

69. *Cathartes aura*. Seen at intervals. Not apparently abundant.

COLUMBIDÆ.

70. *Zenædura carolinensis*. Common.

TETRAONIDÆ.

71. *Pediœcetes phasianellus*, var. *columbianus*. Said to be abundant, especially near Lake Pass.

CHARADRIIDÆ.

72. *Ægialitis vociferus*. Frequent at Summit Lake (Lake Pass), and common generally along the streams.

73. *Ægialitis montanus*. Not numerous.

SCOLOPACIDÆ.

74. *Actodromas Bairdii*. Common at Summit Lake.

75. *Gambetta flavipes*. A single specimen was shot at Summit Lake, August 5th, — the only one seen.

76. *Gambetta melanoleuca*. A single specimen was shot at Summit Lake, August 5th. No others were seen.

77. *Rhyacophilus solitarius*. Numerous at Summit Lake.

78. *Tringoides macularius*. Common at Summit Lake, and along the streams.

79. *Actiturus Bartramius*. Frequently observed flying over.

ARDEIDÆ.

80. *Demiegretta* ? sp. ? A single heron was seen on the South Platte, apparently a *Demiegretta*.

ANATIDÆ.

81. ? *Anas boschas*. A single specimen of apparently this species was observed at Summit Lake.

VI. *List of Birds observed in South Park, Park County, Colorado Territory, in July, 1871 ; with Annotations.*

SOUTH PARK is an elevated plateau enclosed in the mountains of Colorado Territory, occupying nearly its geographical centre. Its average elevation is a little more than nine thousand feet, its area nearly two thousand square miles. It is situated between the 35th and 36th parallels, about fifty miles west of the eastern base of the Rocky Mountains, and has a length of about sixty miles by a breadth of about thirty. The surface of the Park is somewhat diversified, low nearly parallel ridges running through it in a northwest and southeast direction, dividing it somewhat irregularly into a series of valleys, through which flow the South Platte River and its tributaries. Most of the ridges are scantily covered with pines and aspens, especially their northern declivities, and the streams are fringed with various species of willow and cottonwood. The "bunch grass" generally grows luxuriantly, especially in the vicinity of the streams, but considerable portions of the Park are arid and alkaline, particularly to the eastward, where the vegetation strongly resembles that of the more barren portions of the plains. Here the prevailing plants are low artemisia-like forms, rising to but a few inches, and a few species of *Cactus*.

The avian fauna of South Park is far from rich in species ; the greater part of which are woodland birds, the remainder being such as typically characterize the Plains. During a reconnoissance of two weeks in July, only fifty-four species of birds were observed, many of which were seen but once or twice, and less than half of which were very common. Of the numerous family *Sylvicolidæ*, but two species were observed ; of the *Tyrannidæ*, only representatives of two genera (*Contopus* and *Empidonax*) ; while swimming and wading birds were almost wholly absent. A few others occur in close proximity to the Park, the most of which doubtless frequent to some extent the belts of timber that intersect it.

From the great elevation of the Park, its fauna has a decidedly northern aspect, and may be regarded as at least subalpine, and as representative of the Canadian fauna of the Eastern Province of the continent. The nights are cool even in midsummer, the average sunrise temperature for the summer months being probably little, if any, above 40° F. The midsummer showers are generally accompanied with hail and a great reduction of the temperature. The maximum temperature frequently reaches 80° in the shade, the heat at midday being usually quite oppressive. July 14th may perhaps be taken as an average day, when the temperature at sunrise was 38°; at 2 P. M., 78° in the shade; and at sunset, 60°. Although most of the birds are of a northern type, one or two species, as, for example, *Sturnella ludoviciana* and *Zenaidura carolinensis*, are more or less frequent that barely reach the Canadian fauna in the Atlantic States.

In this connection a word or two may be added in respect to the country lying between South Park and the Plains. At Denver (altitude 5,100 feet) the avian fauna is analogous to the Carolinian of the Eastern Province, and extends even into the valleys among the foot-hills. From the base of the mountains up to about 7,500 feet the fauna is more analogous to the Alleghanian, or to that of Southern New England. Thence upward to about 10,500 feet is a zone more resembling the Canadian fauna of the East, or that of Northern New England. From this point upward to the timber-line in the Snowy Range the fauna is more nearly representative of the Hudsonian, or that of the shores of Hudson's Bay and the valley of the McKenzie River. Above this, in the Snowy Range, is a region dotted with snow-fields, where are found several essentially arctic forms.

Following up Turkey Creek, by the stage-road leading from Denver to South Park, we find along this stream the most varied fauna and flora of the middle portion of the Rocky Mountains. Here the rainfall is evidently the greatest, and the vegetation accordingly the most luxuriant. Pines and spruces thickly clothe the slope of the mountains; the streams are densely enclosed with willows, alders, cottonwoods, and other deciduous trees and shrubs, and rosaceous and ranunculaceous plants predominate, giving a flora of a cold-temperate or subalpine type not met with elsewhere between the Rocky Mountains and the Appalachians, and as different from that of the Plains as if it grew on another continent. A profusion of flowers of bright tints meet the

traveller at every step, constantly changing in species with the increase of altitude. Gradually, as one approaches the Park, the variety of species diminishes, the timber becomes more scanty, and on every hand there are evidences of increasing aridity in the climate. The birds also decrease in number and in species, till finally we enter South Park at its northern extremity by a pass having an elevation of about 10,500 feet, and an alpine fauna and flora. A few species of birds* were last seen as we entered the mountains, and others disappeared higher up, where still others were for the first time observed.

Between South Park and Pike's Peak the country is much drier than that portion of the mountains between South Park and Denver. Leaving South Park at its southeastern edge, the road thence eastward to Colorado City, at the eastern base of Pike's Peak, passes through a succession of open park-like tracts of country, covered with short grass. The hills are low and rather scantily timbered, and the whole aspect more or less arid and forbidding. The flora and fauna are far from rich, the birds being mainly such as are found in South Park itself, and the herbaceous vegetation also much the same.

TURDIDÆ.

1. *Turdus migratorius*. Common everywhere.

2. *Turdus Pallasi*. Frequent about Fairplay, and also observed at other points.

The Veery (*Turdus fuscescens*), although not observed in or about the Park, was met with at several points between Denver and the Park, especially along the North Fork of the South Platte.

SAXICOLIDÆ.

3. *Sialia arctica*. Common everywhere.

PARIDÆ.

4. *Parus atricapillus*. A small party were met with at Fairplay, representing of course the *septentrionalis* race, characterized mainly by lighter colors, and more especially by a broader edging of white on the quills.

TROGLODYTIDÆ.

5. *Troglodytes ædon*. Common.

SYLVICOLIDÆ.

6. *Dendroeca Auduboni*. Common along the streams and timbered ridges.

* *Pipilo erythrophthalmus*, var. *arcticus*, *Harporhynchus rufus*, *Mimus carolinensis*, *Icteria virens*, etc.

7. **Wilsonia pusilla.** Abundant in the willows along the streams. Saw sometimes a dozen pairs during a morning's hunt.

The preceding two species were the only *Sylvicolidae* seen. *Geothlypis philadelphia*, var. *Macgillivrayi*, however, is doubtless more or less frequent, as it was common everywhere in the mountains to the eastward.

HIRUNDINIDÆ.

8. **Hirundo horreorum.** More or less generally distributed throughout the Park, but most numerous in the vicinity of Fairplay.

9. **Hirundo bicolor.** Generally distributed, breeding in woodpecker's holes.

10. **Hirundo lunifrons.** Common at intervals throughout the Park. Found a large colony at Fairplay, nesting under the eaves of buildings. Thirty-eight nests were observed on one house, all within a space of twenty feet.

VIREONIDÆ.

11. **Vireo gilvus.** Rather common.

12. **Vireo solitarius**, var. **plumbeus.** One shot and others seen at Fairplay.

ALAUDIDÆ.

13. **Eremophila alpestris.** Common throughout the Park.

FRINGILLIDÆ.

14. **Chrysomitris** sp. ? A species of *Chrysomitris* was frequently noticed at a distance. *C. pinus* occurs throughout the adjoining region, and doubtless this was the species observed in the Park. *C. tristis* was not met with after entering the mountains.

15. **Carpodacus purpureus.** A few pairs were seen at Fairplay.

16. **Passerculus savanna.** Common along the streams, but far more numerous near the mountains. Very numerous at our camp on Jefferson Creek (July 14), where we found nests with eggs and with young. The numerous specimens obtained here presented great variations in size and in markings, but no decided general differences from summer specimens from Massachusetts.*

17. **Poœcetes gramineus.** More or less common.

18. **Chondestes grammaca.** Not numerous.

19. **Zonotrichia leucophrys.** Exceedingly numerous at Fairplay, and everywhere more or less common. The large number of specimens obtained were, with few exceptions, typically of the *leucophrys* type.

* For remarks on the numerous supposed species of this group attributed, to the middle and western portions of North America, see Bull. Mus. Comp. Zoöl., Vol. II, pp. 272-278, April, 1871.

The others were intermediate between this form and the so-called *Z. Gambeli*.*

20. *Junco "caniceps."* Abundant at Fairplay, and generally common near the borders of the Park.

21. *Melospiza melodia.* Occasionally seen along the streams, but nowhere very common. Song undistinguishable from that of the eastern bird. Nest and eggs similar.

22. *Melospiza Lincolnii.* Abundant along the streams, and especially numerous near the mountains.

23. *Spizella socialis.* Not common. But one specimen obtained, and but few observed. The one obtained is scarcely distinguishable from eastern examples, except in being a little lighter colored.

24. *Calamospiza bicolor.* But few seen in the Park, and only near its eastern border. Numerous at one or two points on the road from South Park to Colorado City.

25. *Pipilo chlorurus.* Common near the streams.

ICTERIDÆ.

26. *Molothrus pecoris.* Moderately frequent.

27. *Sturnella ludoviciana.* Abundant. One of the characteristic species of the open portions of the Park.

28. *Scolecophagus cyanocephalus.* Abundant, keeping mainly near the streams. Young full-fledged, and most of the old birds moulting before the middle of July.

CORVIDÆ.

29. *Corvus corax.* A few pairs observed near Fairplay.

30. *Pica caudata*, var. *hudsonica.* Frequent along the streams.

* The sole difference which has been supposed to constantly separate *Z. Gambeli* from *Z. leucophrys* consists in the superciliary stripe being continuous to the bill in *Z. Gambeli*, while in *Z. leucophrys* it terminates at the anterior canthus of the eye, being cut off at this point by a black line running from the eye to the black stripe on the head, or by the black extending down, so as to cover the lores. The extension of the black over the lores is, however, quite variable, especially in specimens from the Rocky Mountains. In individuals referable to *Z. leucophrys*, the black covers the lores completely; in others it extends only as low as the middle of the eye, and in others again not as low as the eye, the ash in front of the eye being cut off from the superciliary stripe by a short narrow black line running upward from the anterior canthus. This line is sometimes quite broad and distinct, or it is dotted with ashy feathers, or is reduced to a few black feathers separated by ashy ones; in which case it is difficult to say whether the specimen should be called *Z. leucophrys*, with the black line reduced to scattered feathers, or *Z. Gambeli*, with a few black feathers in the superciliary stripe. Notwithstanding this, the cases are few in which the specimen cannot be referred by this criterion to one or the other series. Yet the irregularity of the extension of the black over the lores in either race, and the evident transition between them, seems to render their specific separation questionable; their true relations being more those of geographical races.

TYRANNIDÆ.

31. *Contopus borealis*. Occasional in the timber along the ridges, but more plentiful in the mountains to the eastward of the Park.

32. *Contopus virens*, var. *Richardsoni*. Common. Found several nests with half-grown young, July 18 to 23, at Fairplay. Nest placed in the fork of small branches, and quite different from that of *C. virens* in the eastern States, as are also its notes.*

33. *Empidonax "obscurus."* Common in the thick willows' near the streams. Found a nest July 20th containing young but a day or two old, and another the same day with young nearly ready to fly. Nests placed in the forks of branches in dense willow clumps, and much resembled the ordinary nest of *Dendræca æstiva*. Bird very shy, hiding in the bushes, thus rendering it very hard to shoot. Rarely seen even when but a few yards distant, often stealing away without coming into view.

CAPRIMULGIDÆ.

34. *Chordeiles popetue*. Abundant.

TROCHILIDÆ.

35. *Selasphorus platycercus*. Abundant.

PICIDÆ.

36. *Sphyrapicus varius*, var. *nuchalis*. Common in the mountains near the eastern border of the Park.

37. *Sphyrapicus Williamsoni*. A few seen, chiefly at the eastern side of the Park. Quite common in the mountains further eastward.

38. *Melanerpes erythrocephalus*. Not common. A few pairs observed at Fairplay.

39. *Colaptes mexicanus*. Abundant.

FALCONIDÆ.

40. *Falco peregrinus*. One specimen was shot at Fairplay, a young bird that came about our camp in pursuit of blackbirds.

* Specimens of *Contopus virens* from the Rocky Mountains are considerably darker throughout than those from the Atlantic States. They generally lack the white edge to the outer vane of the first primary, usually seen in the latter, though eastern specimens are often without it. The western specimens are less strongly tinged with yellow beneath, and the axillaries are considerably darker. The greater coverts and secondaries are less broadly edged with white. The lower mandible, instead of being yellow as in eastern summer specimens, appears to be always dusky, — black towards the tip and yellow only at the base. But this feature is also frequently shared by autumnal specimens at the East. The whole difference between the two hence seems to consist in the darker tints of the western form.

The variety *Richardsoni* was the only form seen at Denver and Cheyenne, as well as in the mountains, while the specimens from Eastern Kansas were of the eastern type, differing from Massachusetts specimens only in being somewhat more olivaceous.

41. *Falco sparverius*. Not common.
42. *Buteo* sp.? A large *Buteo* was occasionally seen, but none were procured.
43. *Aquila chrysaëtos*. Occasionally observed.
44. *Circus cyaneus*, var. *hudsonius*. Seen occasionally throughout the Park. Shot a pair at Fairplay.

CATHARTIDÆ.

45. *Cathartes aura*. Not frequent, and seen only at Fairplay.

COLUMBIDÆ.

46. *Zenædura carolinensis*. Not common. A few pairs were seen at intervals.

TETRAONIDÆ.

47. *Tetrao obscurus*. Apparently not common.

CHARADRIIDÆ.

48. *Ægialitis vociferus*. Common.
49. *Ægialitis montanus*. Not common. Saw newly hatched young July 28th, and full-grown young the day preceding.

SCOLOPACIDÆ.

50. *Gambetta melanoleuca*. A single specimen was shot on the Platte, near the eastern edge of the Park, — the only one seen.
51. *Rhyacophilus solitarius*. A single pair was seen near Hamilton.
52. *Tringoides macularius*. Common along the streams.

ANATIDÆ.

53. *Chaulelasmus streperus*. A single female was shot July 28th on the Platte, near the eastern edge of the Park, — the only one seen.
54. *Querquedula* sp.? A few pairs were seen along the streams, and at some brackish lakes near Hamilton, probably *Q. cyanoptera*.

VII. *List of Birds observed in the Vicinity of Mount Lincoln, Park County, Colorado, from July 19th to July 26th, 1871; with Annotations.*

THE birds mentioned in the following list were all observed during a week spent in the vicinity of Montgomery, at the northeastern base of Mount Lincoln, at the head of the South Platte River. Doubtless all the species mentioned breed at, or near, where they were observed; the list also probably includes nearly all that occur there in summer. The region is strictly alpine in its features. Our camp was in the

valley of the Platte, at an altitude of about 12,000 feet, from whence excursions were made every day by some of the party to the region above the timber line, which is here about 13,000 feet above the sea-level. One excursion was made to the top of Mount Lincoln, the height of which is usually given as a little over 14,000 feet. Three species (*Anthus ludovicianus*, *Leucosticte tephrocotis*, *Lagopus leucurus*) were obtained above timber line that are truly arctic in their summer distribution, and nearly all the others are known to range to high northern latitudes. Snow remains throughout the year in the gorges nearly down to the forest line, and frosts are of almost nightly occurrence at points considerably below Montgomery, the temperature in July frequently falling to below 30° F. The showers of rain, which were of almost daily occurrence during our visit, are generally attended with heavy thunder, hail, and sleet. Ice is said to form every night at the mining camp on Quandary Peak, about 13,500 feet above the sea.

The timber which thickly covers the lower slopes consists almost exclusively of a single kind of spruce, with here and there representatives of two species of *Populus*. No other conifer was observed higher up than at a point in the Platte valley about five miles below Montgomery, or much above 11,500 feet. Two or three kinds of willow and a small *Betula* occur abundantly in the upper valley of the Platte, and on the declivities of the mountains in places unoccupied by the heavier forest, up to 300 to 500 feet above the limit of trees, becoming more and more diminutive towards their upper limit. For some distance above the forest line are beautiful grassy slopes, and a variety of herbaceous plants, most of them producing a profusion of large, brightly tinted flowers. Many of the species are peculiar to this elevated region, while some are dwarfed or otherwise modified forms of species met with much lower down. Even among the snow-filled gorges are extensive flower-sprinkled grass-plats of great beauty, a variety of diminutive and exquisitely pretty plants ranging even to the summit of Mount Lincoln, wherever there is soil enough to afford them a foothold.

Among the other arctic animals observed are the Little Chief Hare (*Lagomys princeps*), abundant among the loose rocks from a little below timber-line to far above it, and several alpine butterflies.

Nearly all the birds mentioned below were met with as high as the timber line, and many ranged above it. *Wilsonia pusilla*, *Zonotrichia leucophrys*, and *Melospiza Lincolni* were nowhere more abundant than

among the dwarfed willows and birches just above the general limit of trees. Three species (*Anthus ludovicianus*, *Leucosticte tephrocotis*, and *Lagopus leucurus*) were met with exclusively above the timber line.

From about 11,500 feet altitude up to the tree limit the fauna appears to be strictly representative of the Hudsonian fauna of the Eastern Province, while that above the tree limit more resembles that of the American arctic fauna.

TURDIDÆ.

1. *Turdus migratorius*. Abundant. Frequently met with far above timber line. Found a nest containing newly hatched young within three hundred feet of the upper limit of trees.

2. *Turdus Pallasi*. Common; ranging upward to the timber line. Its song was heard at all hours of the day at our camp, near Montgomery.

3. *Myiadestes Townsendii*. Several were observed at an altitude of over 12,000 feet, or near the timber line.

CINCLIDÆ.

4. *Cinclus mexicanus*. Common on the Platte above Montgomery.

SAXICOLIDÆ.

5. *Sialia arctica*. Abundant. More numerous here than we found it at any other point. It was seen by Mr. Bennett on the top of Mount Lincoln, and it breeds up to the limit of trees. Saw a brood of newly fledged young at the extreme upper edge of the timber.

SYLVIIDÆ.

6. *Regulus calendulus*. Common as high as the timber line. Shot a female feeding her newly fledged young.

PARIDÆ.

7. *Parus montanus*. Common. Collected full-grown young, July 23d.

SITTIDÆ.

8. *Sitta carolinensis*, var. *aculeata*. A single individual.

TROGLODYTIDÆ.

9. *Salpinctes obsoletus*. Observed several pairs among the rocks near the timber line.

MOTACILLIDÆ.

10. *Anthus ludovicianus*. Common among the snow-fields above timber line. Saw young birds scarcely able to fly, July 20th.

SYLVICOLIDÆ.

11. *Dendroeca Auduboni*. Common up to the limit of trees.
 12. *Wilsonia pusilla*. Abundant. Most numerous among the low willows above the limit of trees.

HIRUNDINIDÆ.

13. *Hirundo horreorum*. Common at Montgomery. In clear weather flies to the tops of the mountains.
 14. *Hirundo bicolor*. Common about Montgomery, and seen far above timber-line.
 15. *Hirundo lunifrons*. A few seen in company with the preceding.

FRINGILLIDÆ.

16. *Leucosticte tephrocotis*.* Common above timber line on Mount Lincoln, breeding among the snow-fields. The common form of *L. tephrocotis* appears to be abundant in winter throughout the mountains of Colorado, whence I have seen specimens collected near Denver. I also met with it in December on the plains of Wyoming Territory, near the Medicine Bow Mountains.
 17. *Carpodacus purpureus*. Common at Montgomery.
 18. *Chrysomitris pinus*. Common up to the limit of trees.
 19. *Passerculus savanna*. Common in the valley of the Platte, and also numerous on the mountains above timber line.
 20. *Poœcetes gramineus*. Common, ranging considerably above timber line.

* The specimens (4♂ 2♀) of *Leucosticte* obtained on Mount Lincoln differ very much in color from winter specimens of *Leucosticte tephrocotis*, as well as from any figure or description of any form of *Leucosticte* I have seen. Whether they represent more than the breeding plumage of *L. tephrocotis* or a well-marked southern form of that species I am at present uncertain, being without summer specimens of that species. The following is a description of the Mount Lincoln specimens: *Male*. Bill entirely black, or in some specimens with a faint trace of yellow at the base of the lower mandible. Nasal feathers whitish; front of head black, fading to sooty brown on the mentum; no ashy nuchal collar as in winter specimens of *L. tephrocotis*; above umber brown, each feather broadly edged with bright red, fading to rosaceous on the rump and upper tail-coverts; throat sooty brown, tinged slightly with red; breast umber brown; rest of under parts crimson, fading to bright rosaceous posteriorly; wings and tail dusky, tinged with crimson, especially on the basal portions; lesser wing-coverts bright rosaceous. Length 6.25 to 6.75; alar extent, 11.75 to 12.60; wing, 4.05 to 4.20; tail, 2.60 to 2.87. *Female* similar, but duller colored and smaller. Different specimens vary considerably in the intensity and amount of red. Besides wanting the gray nuchal collar, these specimens have the rosaceous of winter specimens replaced by bright red, and the bill black instead of yellow.

Since writing the above, I have had an opportunity of examining several specimens of *Leucosticte* killed at Central City, Colorado, in March, 1869, by Mr. F. E. Everett, and

21. *Zonotrichia leucophrys*. Exceedingly numerous, even to a considerable distance above timber line.

22. *Junco* "caniceps." Common, ranging considerably above timber line.

23. *Spizella socialis*. Frequent about Montgomery.

24. *Melospiza Lincolnii*. Very numerous along the Platte, and also common for some distance above timber line.

ICTERIDÆ.

25. *Scolecophagus cyanocephalus*. Common at Montgomery, and ranges to the tops of the mountains.

CORVIDÆ.

26. *Perisoreus canadensis*. Common.

27. *Cyanura Stelleri*, var. *macrolopha*. More or less frequent.

TROCHILIDÆ.

28. *Selasphorus platycercus*. Common. Repeatedly seen about the flowers far above timber line.

PICIDÆ.

29. *Picus villosus*. The variety *Harrisii* was more or less frequent up to the timber line.

30. *Picoides americanus*, var. *dorsalis*. Common up to the timber line.

31. *Colaptes mexicanus*. Common up to the timber line.

FALCONIDÆ.

32. *Buteo* sp.? A large *Buteo* was frequently observed.

by him presented to the Boston Society of Natural History. Of three males, one (marked "young male") differs but little from the Mount Lincoln specimens, it having no ash on the head. Another corresponds very nearly in color with the so-called *L. griseinucha*, and another nearly as well with the so-called *L. littoralis*. Although these birds may have been born at widely separated localities, it seems probable that some of the differences whereon certain species of *Leucosticte* have been founded may be only individual variations. It is to be noticed, however, that the amount of ash on the head, and the intensity of the colors, vary with locality from the north southward; the most southerly form having no ash on the head, the bill black instead of yellow, and the red of a brighter tint than those from more northern localities. The type of *L. tephrocotis* was a male, killed on the Saskatchewan in May (see Faun. Bor.-Am., II, p. 266), in which the ash formed a narrow nuchal band. In *L. griseinucha*, a more northern form, the gray involves nearly the whole head and the throat; and in *L. littoralis* and *campestris* there is more gray on the head than in *tephrocotis*, and they also appear to be more northern in their distribution. In view of these facts, it seems probable that the Mount Lincoln specimens above described represent the smaller, brighter-colored southern race, in which the ash on the head has entirely disappeared.

TETRAONIDÆ.

33. **Tetrao obscurus.** Apparently more or less common. One was shot in the upper edge of the timber.

34. **Lagopus leucurus.** Common above timber line. Said to descend into the timber in winter, when many are killed by the miners for food.

SCOLOPACIDÆ.

35. **Tringoides macularius.** Common along the Platte to its source. Its nest and eggs were found at Montgomery, July 24th.

ANATIDÆ.

36. **Mergus merganser.** A pair seen at Montgomery.

VIII. *List of Birds collected in the Vicinity of Ogden, Utah Territory, from September 1st to October 8th, 1871; with Annotations.*

THE region to which the following remarks refer embraces the north-eastern portion of the valley of the Great Salt Lake, including a portion of the lake shore near the mouth of the Weber River, the lower portion of the Weber valley, Ogden Cañon, and the mountains north of Ogden. It thus includes a great variety of surface, including the sage-covered plains that form the eastern border of the lake, the numerous lagoons and marshes about the mouth of the Weber River, the thickets of willow and cottonwood that border both this river and the Ogden, and the scantily wooded or almost naked slopes of the adjoining mountains. From the lateness of the season, a few of the summer residents had already migrated, and many others that pass the summer in the mountains or to the northwards had become common. The higher parts of the Wahsatch Range, which bounds the Great Salt Lake Valley to the eastward, doubtless form the summer haunts of most of the land birds observed here, which leave the valley in summer, since the higher peaks of the range rise to the snow line.

The great abundance of aquatic birds that frequent the vicinity of the Great Salt Lake has long been known as one of the characteristic ornithological features of this interesting locality, especially the abundance of pelicans, gulls, cormorants, avocets, stilts, ducks, and other wading and swimming birds, many of which regularly pass the summer here, and breed on the islands of the lake. Yet the bird fauna of this peculiar region has not as yet been fully explored, and hence still offers a highly attractive and promising field to the collector. The only special

report that has as yet appeared respecting the ornithology of the Great Salt Lake Valley is a list of thirty-one species contained in Stansbury's Report,* prepared by Professor Baird from the collections made by Captain Stansbury during his admirable survey of this region in 1849 and 1850. Since that time the region immediately under consideration has undergone important changes. Through the industry and energy of the Mormon emigrants, large portions of the arid plains that surround the lake have been transformed, by irrigation, from a desert to productive farms, abundantly provided with orchards and shade-trees. So great a modification of the flora has, of course, induced a corresponding change in the fauna, so that now many birds are common that were formerly rare, especially among the granivorous and fruit-eating kinds. At the same time the water-fowl have greatly decreased, and have acquired the wildness characteristic of their tribe in the older settled portions of the country. Ducks are still abundant, but, being subject to constant persecution from juvenile and other sportsmen, their numbers are said to be annually appreciably decreasing.

The present list contains one hundred and thirty-seven species collected or observed by Mr. Bennett and myself during five weeks spent almost constantly ornithologizing. As almost every excursion added to our collection one or more species we had not previously seen, it is presumably more or less deficient for even the single month (September) during which most of our observations were made.

TURDIDÆ.

1. *Turdus migratorius*. Common. Said to have been very rare in the Great Salt Lake Valley when it was first settled, but having been carefully protected, it has gradually increased in numbers till it is now a common bird. Doubtless the successful cultivation of the smaller fruits has also done much towards increasing its numbers, by attracting them from less favoring localities. Many are said to remain here all the year, though it is much more numerous in fall and spring than during either summer or winter. Most of the specimens taken by us are much paler than the robin of the East, some of them presenting an exceedingly pallid aspect.

2. *Turdus Pallasi*. One shot September 11th.

3. *Mimus carolinensis*. Common. As numerous in the dense thickets along the Weber River as I ever saw it at the East.

* Stansbury's Exploration and Survey of the Valley of the Great Salt Lake of Utah, 1852, pp. 314 - 325.

4. *Oreoscoptes montanus*. Common. Called "Gray-Bird," and also "Mocking-Bird." Very destructive to the fruit, even the peach not escaping its rapacity.

SAXICOLIDÆ.

5. *Sialia arctica*. Common in spring and fall.

CINCLIDÆ.

6. *Cinclus mexicanus*. Common along the Ogden and Weber Rivers. Shot fourteen in Ogden Cañon in the course of an hour or two, October 2d, and saw several others.

SYLVIIDÆ.

7. *Regulus calendulus*. Shot September 11th and later. Probably not uncommon in fall and spring.

PARIDÆ.

8. *Parus atricapillus*, var. *septentrionalis*. Abundant.

TROGLODYTIDÆ.

9. *Salpinctes obsoletus*. Abundant in the Wahsatch Mountains as far down as the first "bench." About the first of October we saw them several times on the shore of Salt Lake, near the mouth of the Weber River, twelve or fifteen miles from the mountains. Its preference for rocks even here was manifested by one which had chosen a heap of stones as a temporary resting-place.

10. *Cistothorus stellaris*. Abundant in the marshes everywhere.

MOTACILLIDÆ.

11. *Anthus ludovicianus*. Abundant after September 15th.

SYLVICOLIDÆ.

12. *Geothlypis trichas*. Common.

13. *Geothlypis philadelphia*, var. *Macgillivrayi*. Apparently not uncommon.

14. *Icteria virens*. Moderately common.

15. *Helminthophaga ruficapilla*. One shot September 20th, and others seen. Apparently common.

16. *Helminthophaga celata*. First seen September 11th. Common later.

17. *Dendræca Auduboni*. Common after the 15th of September.

18. *Dendræca Blackburniæ*. Not common. A few specimens obtained.

19? *Dendræca nigrescens*. A bluish warbler was once or twice seen which was probably of this species.

- 20. *Dendroeca æstiva*. Common.
- 21. *Wilsonia pusilla*. Common.
- 22. *Setophaga ruticilla*. One seen September 8th.

HURUNDINIDÆ.

- 23. *Hirundo horreorum*. Common.
- 24. *Hirundo lunifrons*. But few were seen, owing probably to the lateness of the season. Their nests were very numerous on the cliffs of Weber and Echo Cañons.
- 25. *Hirundo thalassina*. A few seen September 11th.
- 26. *Cotyle serripennis*. Moderately common.

VIREONIDÆ.

- 27. *Vireo olivaceus*. More or less common.
- 28. *Vireo gilvus*. Rather common.
- 29. *Vireo solitarius*. Rather frequent. Somewhat paler colored than in the Eastern States, but much brighter than those obtained in July in Colorado.

AMPELIDÆ.

- 30. *Ampelis cedrorum*. Rather common.

LANIIDÆ.

- 31. *Collurio ludovicianus*. Quite common. Said to breed.

TANAGRIDÆ.

- 32. *Pyrrhula ludoviciana*. Frequent.

ALAUDIDÆ.

- 33. *Eremophila alpestris*. Common.

FRINGILLIDÆ.

- 34. *Carpodacus purpureus*. Not numerous.
- 35. *Chrysomitris tristis*. Abundant.
- 36. *Chrysomitris psaltria*. Apparently common, associating with the preceding.
- 37. *Passer domesticus*. Recently introduced and apparently flourishing.
- 38. *Passerculus savanna*. Common.
- 39. *Poæcetes gramineus*. Abundant.
- 40. *Coturniculus passerinus*. Common.
- 41. *Zonotrichia leucophrys*, var. *Gambeli*. Abundant. Mainly of the form called "*Gambeli*," but a typical *leucophrys* was also taken.
- 42. *Junco "oregonus"*. Common after about October 1st. The specimens taken scarcely differ from fall specimens of *J. hyemalis*, except in the rufous on the sides.

- 43. *Poospiza Belli*. Common on the Plains among the sage-brush.
- 44. *Spizella socialis*. Abundant.
- 45. *Spizella pallida*. Abundant.
- 46. *Melospiza melodia*. Very abundant. A little paler than specimens from the Atlantic States, but not so markedly so as is the case in some other species. From the locality it should, however, be referable to the *M. fallax*, a name applied to the paler form of *M. melodia* from the Rocky Mountain region.
- 47. *Melospiza Lincolnii*. Exceedingly abundant.
- 48. *Passerella iliaca*, var. *schistacea*. Not numerous. First obtained September 10th.
- 49. *Goniaphea melanocephala*. Common in summer. Leaves about the first week of September. Called "Pea Bird," it being very fond of young peas, and is hence regarded as obnoxious.
- 50. *Cyanospiza amœna*. Not common.
- 51. *Pipilo erythrophthalmus*, var. *arcticus*. Common.
- 52. *Pipilo chlorurus*. Common after September 20th.

ICTERIDÆ.

- 53. *Dolichonyx oryzivorus*. Common. Said to breed here.
- 54. *Agelæus phœniceus*. Exceedingly abundant. Flocks of thousands seen about the marshes. In color, especially in respect to the shoulder-patch, it closely resembles the form prevailing in the Atlantic and Gulf States. A few specimens were taken that had very small spots of black on the ends of the middle coverts, but in none were they so well developed as to typically represent the so-called *A. gubernator*. One specimen was taken which had the exposed portions of the *greater* coverts of the same color as the middle ones, thus forming a very broad conspicuous brownish-yellow patch on each wing.
- 55. *Xanthocephalus icterocephalus*. Abundant, occurring in large flocks about the marshes, associating more or less with the preceding. The colors vary exceedingly in different individuals, from some young females that are only tinged with pale yellowish on the throat, to some males that have the whole throat and breast intense orange red.
- 56. *Sturnella ludoviciana*, var. *neglecta*. Abundant, typically representing the so-called *S. neglecta*. The notes of some individuals, however, were scarcely different from those of the eastern bird, though generally the song is dissimilar and much richer.
- 57. *Icterus Bullockii*. Said to be common in summer. Saw only stuffed specimens in collections at Salt Lake City, said to have been taken in the vicinity.
- 58. *Scolecophagus cyanocephalus*. Very abundant.

CORVIDÆ.

59. *Corvus corax*. Common.

60. ? *Corvus americanus*. None were seen, but it was said to be more or less frequent.

61. *Pica caudata*, var. *hudsonica*. Common.

62. *Cyanura Stelleri*, var. *macrolopha*. Common in the mountains, and occasional in the thickets along the streams; called "Mountain Jay."

63. *Aphelocoma floridana*, var. *Woodhousei*. Common.

TYRANNIDÆ.

64. *Tyrannus carolinensis*. One obtained and two or three others seen.

65. *Tyrannus verticalis*. Not common.

66. *Contopus borealis*. Not common. Several seen among the cottonwoods along Weber River.

67. *Contopus virens*, var. *Richardsonii*. Not common; seen in the same localities as the last.

68. *Empidonax flaviventris*, var. *difficilis*. Not uncommon in favorable localities.

69. *Empidonax* "obscurus." Common.

ALCEDINIDÆ.

70. *Ceryle alcyon*. Common.

CAPRIMULGIDÆ.

71. *Antrostomus Nuttallii*. Abundant in the mountains near Ogden. One was seen October 7th, half-way up the mountains, during a severe snow-storm, the snow being already several inches deep.

72. *Chordeiles popetue*. Abundant till nearly October 1st.

TROCHILIDÆ.

73. *Selasphorus platycercus*. Common.

PICIDÆ.

74. *Picus* sp.? A small spotted woodpecker was seen a few times, near the mouth of Ogden Cañon, which was apparently *P. pubescens*.

75. *Colaptes mexicanus*. Rather common along the Ogden and Weber Rivers. They were accustomed to frequent a high clayey bank near the town, in which were a number of holes. These the woodpeckers entered, and we repeatedly saw them sitting in them, with their heads thrust out at the entrances. About a dozen individuals were quite regularly seen around the place, especially early in the morning. We found

on examining these holes that they entered horizontally but a few inches, and then turned abruptly downward, having about the size and form of the holes the *Colaptes auratus* is accustomed to make in decayed trees. They appeared much attached to the spot, and from all the circumstances we were led to believe that they had nested in the holes which we saw them frequenting, as there were no trees within several miles that could have served them as nesting sites.

STRIGIDÆ.

76. *Otus vulgaris*, var. *Wilsonianus*. One specimen taken.
77. *Bubo virginianus*. Occasional. Said to be quite frequent in winter.
78. *Athene hypogæa*. Several colonies were met with in the vicinity of Ogden, living chiefly in holes made by coyotes and other *Canidæ*, no species of *Cynomys* occurring here.

FALCONIDÆ.

79. *Falco peregrinus*. Common about the marshes of Salt Lake preying upon the water-fowl.
80. *Falco columbarius*. Moderately frequent.
81. *Falco sparverius*. Exceedingly numerous. Along the Weber River, below Weber Cañon, a dozen or more were frequently seen in the air at the same instant, catching grasshoppers.
82. *Buteo borealis*. Not uncommon.
83. *Circus cyaneus*, var. *hudsonius*. Abundant. Especially numerous about the marshes, where they were constantly seen pursuing the blackbirds, but apparently with indifferent success.
84. *Aquila chrysaëtos*. Said to be occasionally killed.
85. *Haliaëtus leucocephalus*. More or less frequent.
86. *Pandion haliaëtus*. A few seen. Said to be common in summer.

CATHARTIDÆ.

87. *Cathartes aura*. Common.

COLUMBIDÆ.

88. *Zenædura carolinensis*. Abundant. Said to breed generally on the ground.

TETRAONIDÆ.

89. *Tetrao obscurus*. Reported to be common in the mountains.
90. *Centrocercus urophasianus*. Common. Much less numerous than formerly. A few years ago it is represented to have been exceedingly abundant, but less than a dozen were seen by us during a quite thorough reconnaissance of the northeastern portion of the Great Salt Lake Valley, they having never been known to be so scarce there before.
91. *Pediæcetes phasianellus*, var. *columbianus*. Common, but said

to be much less numerous the present season than usually. In the Great Salt Lake Valley we have of course the paler or light-colored form of the Plains, to which Mr. D. G. Elliot has restricted the name *P. columbianus*,* the darker form of the more heavily wooded regions of the north being considered by him to be the true *P. phasianellus* (= *P. Kennicottii* Suckley).†

92. *Bonasa umbellus*. The ruffed grouse is said to occur sparingly in the mountains.

PERDICIDÆ.

93. *Ortyx virginianus*. A few pairs of the common quail were introduced from the East last year, and are said to have each raised a brood of young.

94. *Lophortyx californicus*. A few pairs were introduced a short time since, and are said to have raised young the present year (1871).

CHARADRIIDÆ.

95. *Ægialitis vociferus*. Abundant.

SCOLOPACIDÆ.

96. *Gallinago Wilsoni*. Very abundant.

97. *Macrorhamphus griseus*. Abundant September 25th and later; perhaps breeds here.

98. *Pelidna americana*. Common.

99. *Actodromas minutilla*. Not common.

100. *Gambetta melanoleuca*. Abundant.

101. *Gambetta flavipes*. Not common.

102. *Rhyacophilus solitarius*. Not common.

103. *Tringoides macularius*. Not common. Only two or three were seen.

PHALAROPODIDÆ.

104. *Phalaropus Wilsoni*. Abundant. Said to breed in great numbers on the islands in the lake.

RECURVIROSTRIDÆ.

105. *Recurvirostra americana*. Very abundant. Flocks of several thousands seen on the shores of the lake. Said to breed on the islands.

106. *Himantopus nigricollis*. Common, but far less numerous than the preceding, with which it freely associates. Both this and the preceding species are known locally as "White Snipes."

GRUIDÆ.

107. *Grus canadensis*. Occasional in fall and spring.

* Proc. Acad. Nat. Sci. Philad., 1862, p. 403.

† Ibid., 1861, p. 361.

TANTALIDÆ.

108. *Ibis falcinellus*, var. *Ordii*. Common in summer. Leaves early in September. Obtained five specimens out of the seven we saw. Called "Black Snipe." Said to have become numerous only during the last two or three years.

109. *Ibis alba*. Only a few seen. Said to be frequent in summer.

ARDEIDÆ.

110. *Ardea herodias*. Rather common.

111. *Botaurus lentiginosus*. Common.

112. *Nyctiardea grisea*, var. *nævia*. Common.

RALLIDÆ.

113. *Rallus virginianus*. Common.

114. *Rallus crepitans*. Said to be common.

115. *Porzana carolina*. Common.

116. *Fulica americana*. Abundant.

ANATIDÆ.

117. *Anser hyperboreus*. Common in fall and winter, appearing about October 1st. Called "White Brant."

118. *Bernicla canadensis*. Abundant. Exceedingly numerous in the fall. A few said to breed.

119. *Anas boschas*. Common.

120. *Dafila acuta*. Abundant.

121. *Nettion carolinensis*. Abundant.

122. *Querquedula cyanoptera*. Abundant.

123. *Spatula clypeata*. Common.

124. *Chaulelasmus streperus*. Abundant.

125. *Mareca americana*. Common.

126. *Aix sponsa*. Common.

127. *Fulix marila*. Common.

128. *Aythya ferina*, var. *americana*. Abundant.

129. *Erismatura rubida*. Common.

130. *Mergus merganser*. Common.

PELECANIDÆ.

131. *Pelecanus erythrorhynchus*. Leaves about September 1st. Stansbury found it breeding on the islands in immense numbers.*

GRACULIDÆ.

132. *Graculus dilophus*. Common. Called "Black Swan"!

* See Stansbury's Report, pp. 179 and 188.

LARIDÆ.

133. *Larus delawarensis*. Abundant. Has the singular habit of feeding on grasshoppers, which it captures in the air. Breeds in large numbers on the islands.

134. *Chræcocephalus philadelphia*. First seen about October 1st. Three specimens were taken, which differ from average eastern examples in having a much shorter, relatively thicker, and less decurved bill. The difference is so great as to be quite striking.

135. *Xema Sabini*. A single specimen was taken September 28th, the only one seen.

PODICIPIDÆ.

136. *Podiceps cornutus*. One specimen taken. Perhaps common.

137. *Podilymbus podiceps*. Common.

IX. *Summary List of Birds observed in Kansas, Colorado, Wyoming, and Utah, in 1871.*

THE preceding lists being more especially a record of observations respecting the character of the avian fauna of particular localities, the following general summary is appended to show at a glance the area over which the different species were respectively met with, and to indicate the vertical range of those observed in the mountains of Colorado. It is to be understood that the species are summer residents at the localities named, unless otherwise stated. Some were seen only during migration, and unless known to breed at the localities where they were observed, the season of observation is stated. The altitudes given are of course only approximate, though believed to be in the main correct. The list has some negative value, as it is probable that at most of the localities cited few, if any, other species were characteristically common.

TURDIDÆ.

1. *Turdus mustelinus*. Eastern Kansas.

2. *Turdus Pallasi*. Topeka, Kansas (one specimen); mountains of Colorado, from about 8,000 feet to timber line; Ogden, Utah.

3. *Turdus Swainsoni*. Eastern Kansas (May).

4. *Turdus fuscescens*. Mountains of Colorado, up to about 8,500 feet.

5. *Turdus migratorius*. Eastern Kansas (rare); mountains of Colorado up to timber line; Ogden, Utah.

6. *Harporhynchus rufus*. Eastern Kansas; western edge of the Plains of Colorado, and in the mountains up to about 7,500 feet.

7. *Oreoscoptes montanus*. Western edge of the Plains of Colorado; Ogden, Utah.

8. *Mimus polyglottus*. Eastern and Middle Kansas.

9. *Mimus carolinensis*. Eastern and Middle Kansas; western edge of the Plains in Colorado, and in the foot-hills up to about 7,500 feet; Ogden, Utah.

CINCLIDÆ.

10. *Cinclus mexicanus*. Mountains of Colorado from the Plains up to timber line; Ogden, Utah.

SAXICOLIDÆ.

11. *Sialia sialis*. Eastern Kansas, west to Fort Hays.

12. *Sialia arctica*. Mountains of Colorado, from the Plains up to timber line; Ogden, Utah.

13. *Sialia mexicana*. Foot-hills west of Denver, Colorado.

SYLVIIDÆ.

14. *Regulus calenculus*. Mountains of Colorado, from about 8,000 feet to timber line; Wahsatch Mountains, near Ogden, Utah.

15. *Polioptila cærulea*. Eastern Kansas.

CHAMÆIDÆ.

16. ? *Chamæa fasciata*. Mountains of Colorado, west of Colorado City.

PARIDÆ.

17. *Parus atricapillus*, var. *septentrionalis*. Eastern and Middle Kansas; mountains of Colorado, up to about 11,000 feet; Green River, Wyoming Territory; Ogden, Utah.

18. *Parus montanus*. Mountains of Colorado, from 8,000 feet up to timber line.

19. *Lophophanes bicolor*. Eastern Kansas.

SITTIDÆ.

20. *Sitta carolinensis*. Eastern Kansas; var. *aculeata*, mountains of Colorado up to timber line.

21. *Sitta pusilla*, var. *pygmæa*. Mountains of Colorado, up to about 8,000 feet.

TROGLODYTIDÆ.

22. *Troglodytes ædon*. Eastern and Middle Kansas; Cheyenne; western edge of the Plains in Colorado, and in the mountains of Colorado, up to about 10,000 feet.

23. *Salpinctes obsoletus*. Mountains of Colorado, from the Plains up to timber line; Ogden, Utah.

- 24. *Catherpes mexicanus*. Near Colorado City.
- 25. *Cistothorus palustris*. Ogden, Utah.
- 26. *Thryothorus ludovicianus*. Eastern Kansas.

MOTACILLIDÆ.

27. *Anthus ludovicianus*. Mountains of Colorado, above timber line; Ogden, Utah (Sept.); Wahsatch Mountains, probably breeding above timber line.

SYLVICOLIDÆ.

- 28. *Mniotilta varia*. Eastern Kansas (May).
- 29. *Parula americana*. Eastern Kansas (May).
- 30. *Helminthophaga pinus*. Eastern Kansas.
- 31. *Helminthophaga celata*. Eastern Kansas (May); Ogden, Utah (Sept.); Wahsatch Mts.
- 32. *Helminthophaga ruficapilla*. Eastern Kansas (May); Ogden, Utah (Sept.); Wahsatch Mts.
- 33. *Dendroeca coronata*. Eastern Kansas (May).
- 34. *Dendroeca Auduboni*. Mountains of Colorado, from the Plains up to timber line; Ogden, Utah.
- 35. *Dendroeca Blackburniæ*. Eastern Kansas (May); Ogden, Utah (Sept.).
- 36. *Dendroeca pennsylvanica*. Eastern Kansas (May).
- 37. *Dendroeca cærulea*. Eastern Kansas.
- 38. *Dendroeca discolor*. Eastern Kansas.
- 39. *Dendroeca æstiva*. Eastern Kansas; Denver, and western edge of the Plains, Colorado; Cheyenne, Wyoming; Ogden, Utah.
- 40. *Seiurus aurocapillus*. Eastern Kansas.
- 41. *Geothlypis trichas*. Eastern Kansas; Ogden, Utah.
- 42. *Geothlypis philadelphia*. Eastern Kansas; var. *Macgillivrayi*, mountains of Colorado, below 9,000 feet.
- 43. *Oporornis formosus*. Eastern Kansas.
- 44. *Icteria virens*. Eastern and Middle Kansas; Cheyenne; Colorado, at the base of the mountains; Ogden, Utah.
- 45. *Wilsonia mitrata*. Eastern Kansas.
- 46. *Wilsonia pusilla*. Mountains of Colorado, from the Plains to above timber line; Cheyenne; Green River, Wyoming (Oct.); Ogden, Utah.
- 47. *Setophaga ruticilla*. Eastern Kansas; mountains of Colorado, up to about 8,000 feet; Ogden, Utah.

TANAGRIDÆ.

- 48. *Pyranga rubra*. Eastern Kansas.
- 49. *Pyranga ludoviciana*. Mountains of Colorado, from the Plains up to about 8,000 feet.

HIRUNDINIDÆ.

50. *Hirundo horreorum*. Eastern Kansas to Ogden, Utah; in the mountains of Colorado up to timber line.

51. *Hirundo lunifrons*. Eastern Kansas; Ogden, Utah; in the mountains of Colorado up to timber line.

52. *Hirundo bicolor*. Eastern Kansas (May); in the mountains of Colorado up to timber line.

53. *Hirundo thalassina*. Mountains of Colorado, from the Plains up to about 8,000 feet; perhaps to timber line.

54. *Cotyle riparia*. Eastern Kansas.

55. *Cotyle serripennis*. Eastern Kansas; western edge of the Plains; Ogden, Utah.

56. *Progne subis*. Eastern Kansas.

VIREONIDÆ.

57. *Vireo olivaceus*. Eastern Kansas; mountains of Colorado up to 11,000 feet; Ogden, Utah.

58. *Vireo gilvus*. Eastern Kansas; western edge of the Plains of Colorado; Ogden, Utah.

59. *Vireo solitarius*, var. *plumbeus*. Western edge of the Plains of Colorado, and in the mountains up to about 10,000 feet; Ogden, Utah.

60. *Vireo noveboracensis*. Eastern Kansas.

61. *Vireo Belli*. Eastern and Middle Kansas.

AMPELIDÆ.

62. *Ampelis cedrorum*. Eastern Kansas.

63. *Myiadestes Townsendii*. Mountains of Colorado, up to timber line.

LANIIDÆ.

64. *Collurio ludovicianus*. Eastern Kansas; western edge of the Plains of Colorado; Cheyenne; Ogden, Utah.

ALAUDIDÆ.

65. *Eremophila alpestris*. Eastern, Middle and Western Kansas; South Park, Colorado; Laramie Plains; Ogden, Utah.

FRINGILLIDÆ.

66. *Carpodacus purpureus*. South Park, Colorado; Ogden, Utah.

67. *Chrysomitris tristis*. Eastern Kansas; western edge of the Plains of Colorado; Ogden, Utah.

68. *Chrysomitris pinus*. Mountains of Colorado, from the Plains up to timber line.

69. *Chrysomitris psaltria*. Middle Kansas (?); Ogden, Utah.

70. *Leucosticte tephrocotis*. Mountains of Colorado, above timber line; Carbon County, Wyoming (in December).
71. *Plectrophanes nivalis*. Western Kansas (winter).
72. *Plectrophanes ornatus*. Middle Kansas.
73. *Plectrophanes Maccownii*. Cheyenne; Western Kansas (in winter).
74. *Passer domesticus*. Great Salt Lake Valley (introduced).
75. *Passerculus savanna*. Western edge of the Plains to above timber line.
76. *Poœcetes gramineus*. Western edge of the Plains to above timber line.
77. *Coturniculus passerinus*. Kansas; western edge of the Plains; Ogden, Utah.
78. *Chondestes grammaca*. Kansas; South Park; Cheyenne; Laramie Plains; Ogden, Utah.
79. *Zonotrichia querula*. Fort Leavenworth, Kansas.
80. *Zonotrichia albicollis*. Eastern Kansas (May).
81. *Zonotrichia leucophrys*. Eastern Kansas (May); mountains of Colorado up to above timber line; var. *Gambeli*, Ogden, Utah (Sept.); Wahsatch Mountains.
82. *Junco "caniceps."* Mountains of Colorado, from about 7,500 feet up to above timber line.
83. *Junco "oregonus."* Ogden, Utah (Sept.); Wahsatch Mountains.
84. *Poospiza Belli*. Ogden, Utah.
85. *Spizella monticola*. Western Kansas (in winter).
86. *Spizella socialis*. Eastern Kansas; western edge of the Plains; mountains of Colorado up to timber line; Ogden, Utah.
87. *Spizella pallida*. Eastern Kansas; western edge of the Plains; Ogden, Utah.
88. *Spizella pusilla*. Eastern Kansas; western edge of the Plains.
89. *Melospiza melodia*. Eastern Kansas; western edge of the Plains; South Park; Ogden, Utah.
90. *Melospiza palustris*. Eastern Kansas (May).
91. *Melospiza Lincolnii*. Eastern Kansas (May); mountains of Colorado, from about 8,000 feet to above timber line; Ogden, Utah.
92. *Peucæa æstivalis*, var. *Cassinii*. Middle Kansas.
93. *Passerella iliaca*, var. *schistacea*. Ogden, Utah (Sept.); Wahsatch Mountains.
94. *Calamospiza bicolor*. Middle Kansas; western edge of the Plains; South Park, and mountains to the eastward; Cheyenne.
95. *Euspiza americana*. Kansas; Colorado City.
96. *Goniaphea ludoviciana*. Eastern Kansas.

97. *Goniaphea melanocephala*. Middle Kansas; Denver; Cheyenne; Ogden, Utah.

98. *Cyanospiza cyanea*. Eastern Kansas.

99. *Cyanospiza amœna*. Western edge of the Plains, and mountains of Colorado up to about 8,000 feet; Cheyenne; Ogden, Utah.

100. *Cardinalis virginianus*. Eastern Kansas.

101. *Pipilo erythrophthalmus*. Eastern Kansas; var. *arcticus*, western edge of the Plains of Colorado, and in the mountains up to about 8,000 feet; Ogden, Utah.

102. *Pipilo chlorurus*. Mountains of Colorado from about 8,000 feet up to timber line; Ogden, Utah.

ICTERIDÆ.

103. *Dolichonyx oryzivorus*. Ogden, Utah.

104. *Molothrus pecoris*. Kansas; mountains of Colorado up to 11,000 feet; Cheyenne; Ogden, Utah.

105. *Agelæus phœniceus*. Eastern Kansas; mountains and western edge of the Plains of Colorado; Ogden, Utah.

106. *Xanthocephalus icterocephalus*. Eastern and Middle Kansas; western edge of the Plains; Ogden, Utah.

107. *Sturnella ludoviciana*, var. *neglecta*. Kansas; Plains of Colorado and Wyoming; South Park; Ogden, Utah.

108. *Icterus Baltimore*. Kansas; Cheyenne; western edge of the Plains in Colorado.

109. *Icterus Bullockii*. Ogden, Utah.

110. *Icterus spurius*. Kansas; western edge of the Plains in Colorado.

111. *Scolecophagus cyanocephalus*. Western edge of the Plains; mountains of Colorado, to above timber line; Ogden, Utah.

112. *Quiscalus purpureus*. Eastern and Middle Kansas.

CORVIDÆ.

113. *Corvus corax*. Kansas; Colorado; Wyoming; Utah.

114. *Corvus americanus*. Eastern and Middle Kansas; Utah?

115. *Picicorvus columbianus*. Near Colorado City? Medicine Bow Mountains, Wyoming.

116. *Pica caudata*, var. *hudsonica*. Western Kansas; Plains and mountains of Colorado, up to at least 11,000 feet; Wyoming; Utah.

117. *Cyanura cristata*. Eastern Kansas.

118. *Cyanura stelleri*, var. *macrolopha*. Mountains of Colorado, up to timber line; Medicine Bow Mountains, Wyoming; Wahsatch Mountains, Utah.

119. *Aphelocoma floridana*, var. *Woodhousei*. Near Colorado City; Ogden, Utah.

120. *Perisoreus canadensis*. Mountains of Colorado, above 12,000 feet; Medicine Bow Mountains; Wahsatch Mountains.

TYRANNIDÆ.

121. *Tyrannus carolinensis*. Eastern and Middle Kansas; Denver; Cheyenne; Ogden, Utah.

122. *Tyrannus verticalis*. Middle Kansas; Denver; Cheyenne; Ogden, Utah.

123. *Myiarchus crinitus*. Eastern Kansas.

124. *Sayornis fuscus*. Eastern Kansas.

125. *Sayornis Sayus*. Western edge of Plains in Colorado; Cheyenne.

126. *Contopus borealis*. Mountains of Colorado up to 12,000 feet; Ogden, Utah (Sept.); Wahsatch Mountains.

127. *Contopus virens*. Eastern Kansas; var. *Richardsoni*, western edge of Plains, and mountains of Colorado, up to about 12,000 feet; Ogden, Utah.

128. *Empidonax minimus*. Eastern Kansas (May).

129. *Empidonax Traillii*. Eastern Kansas.

130. *Empidonax* "obscurus." Mountains of Colorado up to 12,000 feet; Ogden, Utah.

131. *Empidonax* "Hammondi."* Fort Fred. Steele, Wyoming (Oct.); Ogden, Utah (Sept.).

132. *Empidonax flaviventris*, var. *difficilis*. Ogden, Utah.

ALCEDINIDÆ.

133. *Ceryle alcyon*. Kansas; Plains of Colorado and mountains up to 9,000 feet; Plains of Wyoming; Ogden, Utah.

CAPRIMULGIDÆ.

134. *Antrostomus Nuttallii*. Eastern Kansas; mountains of Colorado, up to about 8,000 feet; Ogden, Utah.

135. *Antrostomus vociferus*. Eastern Kansas.

136. *Chordeiles popetue*. Eastern Kansas; var. *Henryi*, Middle Kansas, and generally westward to Utah; in the mountains of Colorado up to 12,000 feet.

* Dr. Elliott Coues being at present engaged in a revision of the *Tyrannidæ*, all the specimens of *Empidonax* collected during the present expedition have been sent to him for examination, and the names here provisionally adopted are given with his approval. Since the preceding pages were put in type, I have learned that specimens of the so-called *Empidonax* "Hammondi" were among those collected at Ogden, Utah, and at Fort Fred. Steele, Wyoming.

CYPSELIDÆ.

137. *Chætura pelasgia*. Eastern Kansas.

138. *Panyptila melanoleuca*. Garden of the Gods, near Colorado City.

TROCHILIDÆ.

139. *Trochilus colubris*. Eastern Kansas.

140. *Selasphorus platycercus*. Western edge of the Plains, and mountains of Colorado to above timber line; Cheyenne; Ogden, Utah.

CUCULIDÆ.

141. *Coccygus americanus*. Eastern Kansas.

PICIDÆ.

142. *Picus villosus*. Eastern Kansas; var. *Harrisii*, mountains of Colorado.

143. *Picus pubescens*. Eastern and Middle Kansas.

144. *Picoides americanus*, var. *dorsalis*. Mountains of Colorado, from about 8,000 feet to timber line.

145. *Sphyrapicus varius*, var. *nuchalis*. Mountains of Colorado, from 7,000 to 12,000 feet.

146. *Sphyrapicus Williamsoni*. South Park and the mountains to the eastward.

147. *Centurus carolinus*. Eastern Kansas.

148. *Melanerpes erythrocephalus*. Kansas; mountains of Colorado, from the Plains to about 11,000 feet.

149. *Melanerpes torquatus*. Western edge of the Plains up to about 10,000 feet.

150. *Colaptes auratus*. Eastern Kansas.

151. *Colaptes mexicanus*, Western edge of the Plains and mountains of Colorado up to timber line; Ogden, Utah.

STRIGIDÆ.

152. *Otus vulgaris*, var. *Wilsonianus*. Ogden, Utah.

153. *Athene hypogæa*. Middle Kansas; western edge of the Plains; Cheyenne; Ogden, Utah.

FALCONIDÆ.

154. *Falco peregrinus*. Middle Kansas; South Park; Plains of Wyoming; Ogden, Utah.

155. *Falco columbarius*. Ogden, Utah (Sept.); Wahsatch Mountains.

156. *Falco sparverius*. Eastern and Middle Kansas; western edge of the Plains, and mountains of Colorado; Ogden, Utah.

157. *Buteo borealis*. Eastern and Middle Kansas; Colorado.

158. *Archibuteo lagopus*, var. *Sancti-Johannis*. Western and Middle Kansas (winter); Carbon County, Wyoming (winter, abundant).

159. *Nauclerus furcatus*. Eastern Kansas.

160. *Circus cyaneus*, var. *hudsonius*. Kansas; Colorado; Wyoming; Utah.

161. *Aquila chrysaëtos*. Colorado; Wyoming; Utah.

162. *Haliaëetus leucocephalus*. Kansas; Colorado; Wyoming; Utah.

CATHARTIDÆ.

163. *Cathartes aura*. Kansas; Plains of Colorado; South Park; Wyoming; Utah.

COLUMBIDÆ.

164. *Zenædura carolinensis*. Kansas; western edge of the Plains; mountains of Colorado up to about 11,000 feet; Laramie Plains; Ogden, Utah.

MELEAGRIDÆ.

165. *Meleagris gallopavo*. Eastern and Middle Kansas; along the streams as far as timbered; not much to the westward of Middle Kansas.

TETRAONIDÆ.

166. *Tetrao obscurus*. Mountains of Colorado (up to timber line); Wyoming and Utah.

167. *Centrocercus urophasianus*. Laramie Plains; Carbon County, Wyoming; Salt Lake Valley.

168. *Pediæcetes phasianellus*, var. *columbianus*. Middle and Western Kansas; Plains of Colorado and Wyoming; Great Salt Lake Valley.

169. *Cupidonia cupido*. Eastern and Middle Kansas, spreading westward.

170. *Bonasa umbellus*. Mountains of Colorado, Wyoming, and Utah.

171. *Lagopus leucurus*. Mountains of Colorado, above timber line.

PERDICIDÆ.

172. *Ortyx virginianus*. Eastern and Middle Kansas, spreading westward; Great Salt Lake Valley (introduced).

173. *Lophortyx californicus*. Great Salt Lake Valley (introduced).

CHARADRIIDÆ.

174. *Ægialitis vociferus*. Kansas; Plains of Colorado and Wyoming; South Park; Great Salt Lake Valley.

175. *Ægialitis montanus*. Middle Kansas; Plains of Colorado and Wyoming; South Park.

SCOLOPACIDÆ.

176. *Gallinago Wilsoni*. Ogden, Utah (Sept.).

177. *Macrorhampus griseus*. Shores of Great Salt Lake (Sept.).

- 178. *Pelidna alpina*, var. *americana*. Great Salt Lake Valley (Sept.).
- 179. *Ereunetes pusillus*. Eastern Kansas (May).
- 180. *Actodromas maculata*. Fort Leavenworth, Kansas (May).
- 181. *Actodromas Bairdii*. Western edge of the Plains (August).
- 182. *Actodromas minutilla*. Colorado (August 3d); Cheyenne (August); Laramie Plains (August); Ogden, Utah (September).
- 183. *Gambetta melanoleuca*. Eastern Kansas (May); Lake Pass, Colorado (August 3); Cheyenne (August); Laramie Plains (August); Great Salt Lake (September).
- 184. *Gambetta flavipes*. Lake Pass, Colorado (August); Ogden, Utah (September).
- 185. *Rhyacophilus solitarius*. Eastern and Middle Kansas; Colorado (August); Wyoming (August).
- 186. *Tringoides macularius*. Kansas; Colorado, up to 13,000 feet; Wyoming; Utah.
- 187. *Actiturus Bartramius*. Kansas; Colorado.
- 188. *Numenius longirostris*. Kansas.
- 189. *Numenius borealis*. Middle Kansas (June 20th, one individual).

PHALAROPODIDÆ.

- 190. *Phalaropus Wilsoni*. Great Salt Lake.

RECURVIROSTRIDÆ.

- 191. *Recurvirostra americana*. Laramie Plains; Great Salt Lake.
- 192. *Himantopus nigricollis*. Great Salt Lake.

GRUIDÆ.

- 193. *Grus americanus*. Eastern Kansas (May).

TANTALIDÆ.

- 194. *Ibis falcinellus*, var. *Ordii*. Great Salt Lake.
- 195. *Ibis alba*. Great Salt Lake.

ARDEIDÆ.

- 196. *Ardea herodias*. Eastern Kansas; Great Salt Lake Valley.
- 197. *Ardetta exilis*. Eastern Kansas.
- 198. *Botaurus lentiginosus*. Eastern Kansas; Great Salt Lake Valley.
- 199. *Butorides virescens*. Eastern Kansas.
- 200. *Nyctiardea grisea*, var. *nævia*. Eastern Kansas; Great Salt Lake Valley.

RALLIDÆ.

- 201. *Rallus crepitans*. Great Salt Lake Valley.
- 202. *Rallus virginianus*. Eastern Kansas.

203. *Porzana carolina*. Eastern Kansas; Great Salt Lake Valley.

204. *Fulica americana*. Eastern and Middle Kansas; Great Salt Lake Valley.

ANATIDÆ.

205. *Anser hyperboreus*. Great Salt Lake (October).

206. *Bernicla canadensis*. Great Salt Lake Valley.

207. *Anas boschas*. Eastern Kansas; Great Salt Lake Valley.

208. *Dafila acuta*. Great Salt Lake Valley (September).

209. *Nettion carolinensis*. Kansas. Great Salt Lake Valley.

210. *Querquedula discors*. Eastern Kansas.

211. *Querquedula cyanoptera*. Great Salt Lake.

212. *Spatula clypeata*. Great Salt Lake.

213. *Chaulelasmus streperus*. South Park, Col. Great Salt Lake.

214. *Mareca americana*. Great Salt Lake.

215. *Aix sponsa*. Kansas; Great Salt Lake.

216. *Fulix marila*. Eastern Kansas (May); Great Salt Lake (Sept.).

217. *Aythya ferina*, var. *americana*. Great Salt Lake.

218. *Erismatura rubida*. Great Salt Lake (September).

219. *Mergus merganser*. Great Salt Lake (September); Wahsatch Mountains; Fort Fred. Steele, Wyoming (October).

220. *Lophodytes cucullatus*. Fort Fred. Steele, Wyoming (Oct.).

PELECANIDÆ.

221. *Pelecanus erythrorhynchus*. Eastern Kansas. Great Salt Lake.

GRACULIDÆ.

222. *Graculus dilophus*. Great Salt Lake.

LARIDÆ.

223. *Larus delawarensis*. Great Salt Lake.

224. *Chræcocephalus philadelphia*. Great Salt Lake (October).

225. *Xema Sabini*. Great Salt Lake (October).

226. *Hydrochelidon fissipes*. Eastern Kansas (May).

PODICIPIDÆ.

227. *Podiceps cornutus*. Great Salt Lake Valley.

228. *Podilymbus podiceps*. Great Salt Lake Valley.



Allen, J. A. 1872. "Notes of an ornithological reconnaissance of portions of Kansas, Colorado, Wyoming, and Utah." *Bulletin of the Museum of Comparative Zoology at Harvard College* 3(6), 113–183.

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