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ART. XXV.—FIELD-NOTES ON BIRDS OBSERVED IN DAKOTA AND MONTANA ALONG THE FORTY-NINTH PARALLEL DURING THE SEASONS OF 1873 AND 1874.*

By Dr. Elliott Coues, U. S. A.,
Late Surgeon and Naturalist U. S. Northern Boundary Commission.

The following notes result from observations made in the field during my connection with the United States Northern Boundary Commission—Archibald Campbell, Esq., Commissioner, Major W. J. Twining, Corps of Engineers, U. S. A., Chief Astronomer. The line surveyed by the Commission in 1873 and 1874 extended from the Red River of the North to the Rocky Mountains, a distance of 850 miles, along the northern border of the Territories of Dakota and Montana, in latitude 49° north. During the season of 1873, I took the field at Pembina, on the Red River, early in June, and in the course of the summer passed along the Line nearly to the Coteau de Missouri, returning from the Souris or Mouse River via Fort Stevenson and the Missouri to Bismarck. This season's operations were entirely on the parallel of 49°, and in the watershed of the Mouse and Red Rivers, my principal collecting-grounds being Pembina, Turtle Mountain, and the Mouse River. This region of the northerly waters is sharply distinguished geographically and topographically, as well as zoologically, from the Missouri and Milk River Basin, which I entered the following year. In 1874, I began at Fort Buford, at the mouth of the Yellowstone, travelled northwesterly to 49°, which was reached at Frenchman's River, one of the numerous tributaries of Milk River, and thence along the parallel to the Rocky Mountains at Waterton or Chief Mountain Lake and other headwaters of the Saskatchewan; returning back on the Line to Three Buttes or Sweetgrass Hills, thence direct to Fort Benton, Montana, and thence by a boat voyage down the Missouri to Bismarck. In neither season was much collecting done except along the parallel itself; and the operations of each season were in a region sharply distinguished, as I have said, by its faunal peculiarities. From these two broad belts of country, corresponding at 49° nearly to the Territories of Dakota and Montana respectively, is to be set apart a third, that of the Rocky Mountains alone.

I made an elaborate comparison of the faunal characters of these three

[* For articles on other portions of the same writer's collection, see this Bulletin, this Vol., No. 1, pp. 259-292, and No. 2, pp. 481-518.—Ed.]

regions with reference to anticipated publication in connection with the official report of the United States Boundary Commission; but the present is hardly the place to present these considerations in detail. I may, however, state that my results agree closely with those derived from the geological investigations made by Mr. George M. Dawson, my colleague of the British contingent of the Survey, whose valuable Report should be consulted in this connection, and that they are in striking accord with what would be the geographer's or the topographer's consideration.

1. *Red River region*, or watershed of the Red and Mouse Rivers. At 49° this extends westward along the northern border of Dakota, nearly to Montana,—to the point where the Coteau crosses the Line. The bird-fauna of this region is decidedly Eastern in character,—much more so than that of the portion of the Missouri Basin which lies south of it and no further west. It is well distinguished, both by this Eastern *facies* and by the absence of the species which mark the Missouri region. The region consists of more or less (nearly in direct ratio as we pass westward) fertile prairie, treeless except along the streams, cut by the two principal river-valleys, the Red and the Mouse, crossed by the low range of the Pembina Mountains, and marked by the isolated butte known as Turtle Mountain. It is bounded to the west and south by the Coteau,—a comparatively very slight ridge, which nevertheless absolutely separates the two great watersheds. The Red River flows nearly due north; the Mouse River makes a great horseshoe bend, at first directed toward the Missouri, which it almost reaches before it is "bluffed off", literally, and sent northward.* The bird-fauna of Pembina and the whole immediate Red River Valley is thoroughly Eastern. The only Western trace I observed was *Spizella pallida* and some *Icteridæ*, especially *Scolecophagus cyanocephalus;* though *Sturnella neglecta* and *Xanthocephalus icterocephalus* are both common prairie birds much further east, as *Pediœcetes columbianus* also is. Characteristic mammals are *Spermophilus 13-lineatus*, *S. franklini*, *Tamias quadrivittatus*, *Thomomys talpoides*, and the rare *Onychomys leucogaster*. Out on the prairie, beyond the Pembina Mountains, this region is distinguished by the profusion of several very notable birds,—*Anthus spraguii*, *Plectrophanes ornatus*, *Passerculus bairdi*, and *Eremophila leucolæma*, all breeding, none of them observed at Pembina. Here also was found *Coturniculus lecontii*. This treeless area is further marked by the absence of sundry birds common enough in the heavily-timbered Red River Valley, as *Empidonaces*, *Vireones*, *Antrosto-*

* Fort Pembina is situated on the Red River, latitude 49° nearly; longitude 97° 13′ 42″ west; altitude 790 feet above sea-level. The Pembina Mountains, well wooded, with a maximum elevation of about 1,700 feet, lie 35 miles west of the Red River, forming an escarpment which separates the low immediate valley of the Red River from the next higher prairie steppe, which reaches to the Coteau. Turtle Mountain is an isolated, heavily-wooded butte, 125 miles west of Pembina, with an elevation of about 2,000 feet above sea-level, lying directly on the parallel of 49°. Our camp, at its west base, was in longitude 100° 30′ 41.1″, distant 149.25 miles from Pembina along the parallel.

mus vociferus, *Turdus pallasi*, *Geothlypis philadelphia*, *Goniaphea ludoviciana*, *Setophaga ruticilla*, and many others. *Spermophilus richardsoni* begins in this region, and *S. franklini* and doubtless *Onychomys* end here. There are Badgers in plenty and a few Antelopes; there were no Buffalo in 1873, though the country was still scored with their trails, and skeletons were plenty from the Mouse River westward. This region is still more strongly marked by the *absence* of the Missouri specialties.

2. *The Missouri region*, or the great watershed of the Missouri and Milk Rivers. As soon as we cross the Coteau, the whole aspect of the country changes, and there is a marked difference in the fauna. We enter a much more sterile and broken region, absolutely treeless excepting along the larger water-courses, full of "bad lands", with much sage-brush,—such country stretching, with scarcely any modification, to the base of the Rockies. In this latitude, the Milk River is the main artery, with many north-south affluents crossing 49°. The characteristic mammals are the Buffalo (first seen in 1874 in the vicinity of Frenchman's River), Antelope, Prairie and Sage Hares (*LL. campestris* and *sylvaticus* var. *nuttalli*), the Prairie "Gophers" (*Spermophilus richardsoni*, in extraordinary abundance), and Prairie "Dogs" (*Cynomys ludovicianus*), some of these being perfectly distinctive of the Missouri as compared with the Red River region. *Putorius longicauda* is the Ermine of this region. Kit Foxes (*Vulpes velox*) are common, but so they are along the Mouse River. The characteristic birds are *Calamospiza bicolor*, *Tyrannus verticalis*, *Plectrophanes maccowni*, *Pica hudsonica*, *Speotyto hypogœa*, *Centrocercus urophasianus* (diagnostic of the region, like the mammal *Cynomys ludovicianus*, or the reptiles *Phrynosoma douglassi* and *Crotalus confluentus*), and *Eudromias montanus*. Few, if any, distinctively Eastern birds extend across or even into this region. *Plectrophanes ornatus* goes to the mountains, but in diminished numbers; one specimen of *Neocorys* was taken near the mountains, but neither *Passerculus bairdi* nor *Coturniculus lecontii* was observed; *Eremophila* continues in full force.

The Sweetgrass Hills, or Three Buttes, are the most considerable outliers of the Rocky Mountains, along the parallel of 49°, quite isolated on the prairie. I noticed no avian specialties here, but Mountain Sheep were comparatively abundant (as they were also along the bluffs of the Missouri River, above the mouth of the Yellowstone), and the Yellow-haired Porcupine, *Erethizon epixanthus*, was numerous.

3. *Rocky Mountain region.*—Rising gradually and, of course, imperceptibly, the Missouri region maintains its features to the very foot of the mountains, the headwaters of the Milk River being prairie streams, sluggish, warm, and muddy, with much alkaline detritus. The divide between this watershed and that of the Saskatchewan is too slight to be recognized as such by an inexperienced eye; on passing it, we strike the clear, cold, turbulent streams from the mountains, abounding in *Salmonidæ*, and soon enter the woods. This region is strongly marked, not only by "Western" species, in the geographer's sense, but

by Alpine forms, strangers to lower altitudes at the same latitude, by exclusively arboreal forms, and by abrupt disappearance of the prairie types mentioned in the preceding paragraph. The marks of the region, as compared with the prairie, are unmistakable. We here find *Lagomys princeps* (down to 4,500 feet), *Tamias lateralis*, *Sciurus hudsonius* var., *Neotoma cinerea*, *Arctomys flaviventris*, among mammals; large game was scarce,—a few deer (*C. virginianus*), a bear or two, and an alleged *Aploceros montanus*. There were no live Buffalo, but plenty of skulls and skeletons far into the mountains. Among notable birds may be mentioned *Cinclus mexicanus*, *Dendrœca auduboni*, *Geothlypis macgillivrayi*, *Ampelis garrulus*, doubtless breeding !, *Perisoreus canadensis*, *Empidonax hammondi*, *E. obscurus*, *Selasphorus rufus*, *Picus harrisi*, *Asyndesmus torquatus*, the two Alpine Grouse, *Tetrao franklini* and *T. richardsoni* (together with *Pediœcetes*, which pervades all three regions), *Bucephala islandica* (breeding), and *Histrionicus torquatus* (breeding).

Some of the more conspicuous birds of the three regions, or of any one of them, may be tabulated in the following form. The implication in each case is simply my own observations, not the known general range of the species. All the species in this table, doubtless even *Ampelis garrulus*, were on their breeding-grounds, excepting a very few migrants seen early in June at Pembina.

	Red River region.	Missouri region.	Rocky Mountain region.		Red River region.	Missouri region.	Rocky Mountain region.
Turdus migratorius	×	×	×	Cyanurus cristatus	×		
Turdus fuscescens	×			Perisoreus canadensis			×
Cinclus mexicanus			×	Tyrannus carolinensis	×	×	×
Sialia arctica			×	Tyrannus verticalis		×	×
Eremophila leucolæma	×	×		Savornis sayus		×	×
Neocorys spraguii	×	×		Contopus virens	×		
Mniotilta varia	×			Empidonax traillii	×		
Helminthophaga celata	×	×	×	Empidonax minimus	×		
Dendrœca auduboni			×	Empidonax hammondi			×
Dendrœca pennsylvanica	×			Empidonax obscurus			×
Dendrœca striata	×			Antrostomus vociferus	×		
Dendrœca maculosa	×			Trochilus colubris	×		
Geothlypis philadelphia	×			Selasphorus rufus			×
Geothlypis macgillivrayi			×	Coccygus erythrophthalmus	×		
Setophaga ruticilla	×			Picus villosus	×		
Ampelis garrulus			×	Picus harrisi			×
Vireo philadelphicus	×			Melanerpes erythrocephalus	×	×	
Plectrophanes ornatus	×	×		Asyndesmus torquatus			×
Plectrophanes maccowni		×		Colaptes auratus	×		
Centronyx bairdi	×	?		Colaptes "hybridus"		×	×
Coturniculus lecontii	×			Speotyto hypogæa		×	
Junco hyemalis	×			Falco polyagrus		×	?
Zonotrichia querula	×			Buteo swainsoni	×	×	×
Melospiza melodia	×			Tetrao franklini			×
Calamospiza bicolor		×		Tetrao richardsoni			×
Pipilo erythrophthalmus	×			Centrocercus urophasianus		×	
Pipilo arcticus		×	×	Pediœcetes columbianus	×	×	×
Icterus spurius	×			Eudromias montanus		×	?
Icterus baltimorii	×			Recurvirostra americana		×	?
Scolecophagus ferrugineus	×			Steganopus wilsoni	×	×	?
Scolecophagus cyanocephalus	×	×	×	Fuligula vallisneria	×		
Quiscalus purpureus	×	×	×	Bucephala islandica			×
Pica hudsonica		×	×	Histrionicus torquatus			×

The list herewith is restricted to the birds actually observed and generally shot.

There remains the agreeable duty of witnessing the ready and unvarying courtesy extended to the Naturalist of the Commission by Mr. Campbell and Major Twining, who sought to aid by all means in their power the scientific interests he had in charge; and by Captain W. F. Gregory, Corps of Engineers, U. S. A., to whose party he was attached during the season of 1874.

TURDUS (PLANESTICUS) MIGRATORIUS, *Linn.*

The Robin.

Found in abundance at Pembina, where it was breeding in the wooded river-bottom. In this latitude, the eggs are generally laid during the middle and latter parts of June, and I scarcely think that more than one brood is reared annually. Further westward the species seems to occur chiefly during the migrations, as most of the country is unsuited to its wants. In September, large numbers were observed in the fringes of trees along the Mouse River. During the second season, the birds were again found on the Upper Missouri River and in the Rocky Mountains. On the whole, the species is much less numerous, excepting in the immediate valley of the Red River, than it is in settled and wooded portions of the United States, and probably none pass the winter in this latitude.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2953	♂	Pembina, Dak	June 12, 1873	Elliott Coues.				Skin.
2954	♀	do	do	do				do.
2985		do	June 14, 1873	do				Egg.
3117		do	June 22, 1873	do				do.
3126		do	June 23, 1873	do				Three eggs.
3130		do	June 24, 1873	do				Nest with 5 eggs.
3131		do	do	do				Nest: young in alcohol.
3756		Mouse River, Dak	Sept. 16, 1873	do				Skin.

TURDUS (HYLOCICHLA) PALLASI, *Cab.*

Hermit Thrush.

The Hermit Thrush was not observed during the Survey until toward the close of the second season, when specimens were taken in the Rocky Mountains near Chief Mountain Lake, under circumstances which left no doubt of its breeding in the vicinity. As it is, however, a common species of wide distribution in North America, it is doubtless to be found, like the Robin, wherever timber grows, along the line of the Northern Boundary.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4531	....	Rocky Mountains, latitude 49°.	Aug. 20, 1874	Elliott Coues.	.....	.....	.....	Skin.
4606	....	....do	Aug. 25, 1874	....do	.....	.....	.....	....do.

TURDUS (HYLOCICHLA) SWAINSONI, *Cab.*

OLIVE-BACKED THRUSH.

The remarks made under head of the last species, with regard to geographical distribution, are equally applicable to the present one. It was only observed, however, in September, during the general autumnal migration, in the slight fringe of trees along the stream where I was collecting at the time. In a country so nearly treeless as is the tract lying between the Red River and the Rocky Mountains, the slightest pieces of woodland are eagerly sought by all the migrants as stopping-places for food and rest. Though at other seasons tenanted by few species, they become populous in the fall by the presence of great numbers of small insectivorous and granivorous species, among which the *Turdidæ*, *Sylvicolidæ*, and *Fringillidæ* are conspicuous.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3759	....	Mouse River, Dak ..	Sept. 16, 1873	Elliott Coues.	7. 50	12. 10	3. 80	Skin.

TURDUS (HYLOCICHLA) FUSCESCENS, *Steph.*

VEERY, or WILSON'S THRUSH.

Unlike either of the preceding species, the Veery does not appear to extend westward beyond the Valley of the Red River,—at any rate, it was only observed in the vicinity of Pembina. Here it was found breeding in abundance during the month of June, when its exquisite song enlivened the tangled recesses of the wooded river-bottom, in which the timid birds secreted themselves, and formed one of the most characteristic pieces of bird-melody to be heard in that ill-favored locality. A nest was found on the 9th of June, containing four fresh eggs, uniform, bluish-green in color, and measuring about 0.86 in length by 0.66 in diameter. It was placed upon a small heap of decayed leaves which had been caught on the foot-stalks of a bush a few inches from the ground, and composed of weed-stems, grasses, and fibrous bark-strips, woven together, and mixed with withered leaves. The walls were

thick, giving a bulky, irregular, and rather slovenly appearance, and causing the cavity to appear comparatively small,—it was only about 2½ inches in diameter by less than 2 inches in depth, though the whole nest was as large as a child's head.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2927	♀	Pembina, Dak	June 9, 1873	Elliott Coues	.....	.....	.....	Skin, with nest and 4 eggs.
2955	....	....do	June 12, 1873	....do	.....	.....	.....	Skin.
2978	....	....do	June 14, 1873	....do	7.75	12.25	.....	....do.

MIMUS CAROLINENSIS, (*Linn.*) *Gray.*

CATBIRD.

The Catbird was ascertained to be one of the common species of the Red River region, where it was breeding in June, in situations similar to those it selects in the East. I traced it westward to Turtle Mountain, but did not observe it again in the Rocky Mountains, where its presence was to have been expected. It is also a rather common species on the Upper Missouri and the northern affluents of this and of the Milk River. The Missouri appears to be the highway by which the species gains the Rocky Mountains, as observed by Dr. Hayden. The naturalists of the Northwest Boundary Commission collected specimens in Washington Territory, and Sir John Richardson has left a record of its occurrence in the Saskatchewan region as far north as latitude 54° north. As at Pembina, the bird was breeding in June in the shrubbery along the Upper Missouri and its tributaries.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2958	....	Pembina, Dak	June 13, 1873	Elliott Coues.	.....	.....	.....	Nest with 4 eggs.
3061	....	....do	June 19, 1873	....do	.....	.....	.....	Nest with 2 eggs.
3114	....	....do	June 22, 1873	....do	.....	.....	.....	Three eggs.
3127	....	....do	June 23, 1873	....do	.....	.....	.....	Two eggs.
3217	....	....do	June 30, 1873	....do	.....	.....	.....	Nest with 5 eggs.
3352	....	Turtle Mountain, Dak.	July 23, 1873	....do	.....	.....	.....	Skin.
4024	....	Big Muddy River, Mont.	June 22, 1874	....do	.....	.....	.....	Skin; nest with 3 eggs.
4025	....	....do	.....do	....do	.....	.....	.....	Skin.

HARPORHYNCHUS RUFUS, (*Linn.*) *Cab.*

THRASHER, or BROWN THRUSH.

Observed at Pembina, which appears to be near the northern limit of the distribution of this species. In other latitudes, however, it extends

further westward, having been found by earlier expeditions in various portions of Dakota, Nebraska, Wyoming, and Colorado. It is one of the species of *Turdidæ* which does not appear to leave the United States in winter, as we have no West Indian or Central American quotations. It breeds in suitable localities anywhere within general range. A nest containing four eggs was found at Pembina late in June.

During the second season, the species was observed on the Missouri above Fort Buford.

List of specimens.

Coll No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3084	....	Pembina, Dak	June 21, 1873	Elliott Coues.	.....	.....	.....	Nest with 4 eggs.
.....	....	Near Fort Buford, Dak.	July —, 1874	....do	.....	.....	.....	(Not preserved.)

CINCLUS MEXICANUS, *Sw.*

American Dipper, or Water Ouzel.

During the tedious march through the monotonous country of the Milk River, when little was to be looked for that had not already been found, I daily indulged pleasant anticipations of change for the better, in the new and more varied features of the avifauna which I should meet on entering the mountains. I was particularly desirous of finding the Dipper,—a bird that in former years had given me the slip when I was crossing the mountains of New Mexico and Arizona. Nor was I disappointed; the most favorable conditions of the bird's existence are met in the many crystal cascades, fed by the snow-capped peaks that form Chief Mountain Lake,—a beautitul sheet of water environed by precipitous mountains, debouching with a tortuous course into one of the many clear streams that unite to form the Saskatchewan. Nor was this romantic spot the home of the Dipper alone, among the more interesting forms of animal life. The Bohemian Waxwing was breeding here, many degrees of latitude further south than had been known before. So was the Harlequin Duck, like the Waxwing then for the first time ascertained to rear its young within the limits of the United States. Barrow's Golden Eye and other species, to me, at least, extremely interesting, were here first encountered, as more fully noted in other portions of this narrative.

At the time of my visit, it was too late to look for the nest or eggs of the Dipper, as the young were already on wing; that they were bred in the immediate vicinity, at an altitude of only about 4,000 feet, was evident from the immature condition of the specimens examined.

My observations upon the habits of the species were too limited to enable me to add anything to the account, compiled from various sources, which was published in the "Birds of the Northwest".

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4545	....	Rocky Mountains, latitude 49°.	Aug. 21, 1874	Elliott Coues.	.....	.....	.....	Skin.

SIALIA ARCTICA, *Sw.*

Rocky Mountain Bluebird.

The Northern Boundary appears to be slightly beyond the limit of distribution of the Eastern Bluebird, since the species was not observed at Pembina, where the avifauna is almost entirely Eastern in its composition. The Western Bluebird, *S. mexicana*, is still further removed from the region now under consideration. The third and only other species of this country has a more northerly distribution than either of the others, reaching to about latitude 64° or 65° north; it is found from the eastern foothills of the Rocky Mountains to the Pacific, and in some localities is very abundant. A few individuals were observed by the Commission in the Rocky Mountains, at Chief Mountain Lake, but no specimens were preserved. Its habits are much the same as those of its well-known Eastern congener.

REGULUS CALENDULA, *Licht.*

Ruby-crowned Kinglet.

This species, of general distribution throughout the wooded portions of North America, was observed on Mouse River, in September, during the autumnal migration, frequenting the dense undergrowth of the river-bottom in company with *Helminthophaga celata* and *Dendrœca coronata*. In its spring and autumn movements, it undoubtedly passes the several wooded points of the line, and may yet be found breeding in the mountains in this latitude.

Its nest and eggs long remained among the special desiderata of American ornithologists. So far as known, no authentic specimens reached our hands until two or three years ago, when Mr. J. H. Batty, then attached to Dr. Hayden's Survey, discovered a nest in Colorado, July 21, 1873. It was placed on a spruce bough, about 15 feet from the ground, and contained five young and one egg. The structure, which I have examined at the Smithsonian, is larger than such a tiny architect would be expected to produce, and consists of a loosely blended mass of hair and feathers, mixed with moss and short pieces of straw. Other observers, notably Mr. T. M. Trippe, had previously indicated the undoubted breeding of the species in the higher wooded portions of Colorado, which is confirmed by the discovery of this nest.

It is a very curious fact, in the history of this genus, that a variety of *Regulus calendula*, or a very closely allied species, should be among the few resident birds which constitute the isolated fauna of the island of Guadeloupe, 200 miles south of San Diego, Cal.

PARUS ATRICAPILLUS SEPTENTRIONALIS, *Harris.*

LONG-TAILED CHICKADEE.

An abundant resident of the region of the Upper Missouri, in all suitable situations; but neither this nor any other species of the genus was noticed in the Red River Valley. It is the characteristic form of the whole Rocky Mountain region from the Fur Countries into Mexico, where it is the only representative of the genus, excepting *P. montanus*.

Detailed measurements of a series of specimens of this disputed form, for comparison with those of *P. atricapillus*, will be found in my work already quoted. These were carefully made in the flesh, at Fort Randall, during the winter of 1872–73. The average length was found to be 5.50 inches; the wing, 2.40 to 2.75; and the tail, 2.60 to 2.80.

A specimen procured at Chief Mountain Lake is preserved among the collections of the Commission.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4634	....	Rocky Mountains, lat. 49°.	Aug. 28, 1874	Elliott Coues.	...	.....	.....	Skin.

TROGLODYTES AËDON, *Vieill.*

HOUSE WREN.

Observed as far west as the confines of the Missouri Coteau. The westernmost specimens, as well as those from the immediate valley of the Red River, appear to be typical *aëdon*. The Eastern form has also occasionally been met with in the Missouri region itself; though there the prevailing type is the var. *parkmanni*.

On the Red River, in June, the species was breeding very abundantly in the neighborhood of the fort and town of Pembina.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2791	....	Pembina, Dak	June 2, 1873	Elliott Coues	4.90	6.70	.....	Skin.
3104	....	....do	June 22, 1873	....do	.....	.....	.....	....do.
3115	....	....do	..... do.....	....do	.....	.....	.....	Nine eggs (2 sets).
3132	....	....do	June 24, 1873	....do	.....	.....	.....	Nest with 5 eggs.
3173	....	....do	June 26, 1873	....do	.....	.....	.....	Five eggs.
3727	....	Mouse River, Dak ..	Sept. 3, 1873	....do	....	.....	.....	Skin.
3744	....	Long Coteau River, Dak.	Sept. 11, 1873	....do	5.00	6.75	.....	....do.

CISTOTHORUS STELLARIS, (*Licht.*) *Cab.*

SHORT-BILLED MARSH WREN.

The present is one of a few species of general distribution in the Eastern Province, which appears much more abundant along its line of migration in the Mississippi Valley than on the Atlantic coast. In the East, the species does not appear to have been observed beyond Southern New England. The present specimens, secured at Pembina in June, and later in the season along the Mouse River, are the northernmost on record, probably representing about the limit of its distribution in this quarter. The species has been observed westward to the Loup Fork of the Platte. I found the birds to be rather plentiful along the Red River, in low, oozy ground overgrown with scrub willows, and also in the reedy sloughs of the prairie. They were undoubtedly breeding here, though no nests were secured.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2910	♂	Pembina, Dak	June 4, 1873	Elliott Coues	4.50	5.75	.....	Skin.
3451	....	Mouse River, Dak ..	Aug. 9, 1873	....do	.....	.....	.....	....do.

TELMATODYTES PALUSTRIS, (*Wils.*) *Cab.*

LONG-BILLED MARSH WREN.

This species was not observed till we reached the Rocky Mountains, when a few were seen on marshy ground near Chief Mountain Lake. It is, however, of undoubted occurrence in suitable situations along the Line.

EREMOPHILA ALPESTRIS LEUCOLÆMA, *Coues.*

WESTERN HORNED LARK.

One of the most interesting points in the history of the Horned Lark is its peculiar distribution during the breeding-season. Its breeding-range is in no way related to zones of latitude, nor yet is it determined by altitude, but by the topographical features of the country. It rarely, if ever, stops to breed along the Atlantic coast so far south as New England, where the surface of the country is not adapted to its peculiar wants. It is stated to occasionally nest in portions of Canada West; but it is not until we reach the valley of the uppermost Mississippi, in a broad sense, that we find the bird regularly breeding within the United States. I am informed by Mr. W. K. Lente, who accompanied the expedition during the season of 1873, that it nests in Wisconsin, near Racine, laying about the middle of April, even before the snow is off the ground.

From the Red River and corresponding longitude, west to the Rocky Mountains, it breeds in profusion, and during the greater part of the year it is, without exception, the most abundant, universally diffused, and characteristic species of the prairie avifauna. Numerous specimens were taken, not only along the parallel of 49°, but also on the Missouri and Milk Rivers, and the species accompanied our line of march into the mountains. The individuals bred in this dry and sterile region are usually lighter-colored than those of better-watered areas, and are those which I have designated by the term *leucolæma*, in indication of a slight geographical differentiation.

The Horned Lark is one of the few species which, in this latitude, usually rear at least two broods each season,—a fact which in part accounts for the preponderance of individuals over those of the species with which they are associated. I have already adverted to the extremely early nesting-time which has been ascertained, and have only to add that the period of reproduction is protracted through July. I have observed young birds on the wing in June, and found fresh eggs in the nest during the latter half of July. In fact, all through the summer months the troops of Larks everywhere to be seen consist of old birds mixed with the young in all stages of growth. The great flocks, however, are not usually made up until the end of the summer, when all the young are full-grown, and the parents, having concluded the business of rearing their young, have changed their plumage. The young of the first brood soon lose the peculiar speckled plumage with which they are at first covered; the later ones change about the time the feathers of the old birds are being renewed. The agreeable warbling song is scarcely to be heard after June.

While it is not probable that any of these birds endure the full rigors of winter in the exposed country of this latitude, I am unable to say when they retreat. They continue abundant until October, and probably only retreat before the severe storms of the following month, to return again in March, if not in February. It is brave and hardy, one of the few birds that weather the terrible storms that usually prevail in April in the Missouri region.

The nest of the Horned Lark may be stumbled upon anywhere on the open prairie. It is a slight affair,—merely a shallow depression in the ground, lined with a few dried grass-stems. The eggs are four or five in number, measuring nearly an inch in length by about three-fifths in breadth; they are very variable in contour. The color is well adapted to concealment in the gray-brown nest, being nearly the color of the withered materials upon which they rest, thickly and uniformly dotted with light brown. The eggs and young birds, like those of other small species nesting on the ground in this region, often become the prey of the foxes, badgers, and weasels, if not also of the gophers.

The Horned Lark is a sociable bird, not only highly gregarious with its own kind, but one that mixes indiscriminately with several other spe-

cies, as Sprague's Lark, the Savanna Sparrow, Baird's, Maccown's, and the Chestnut-collared Buntings, all of which are abundant birds of the same region.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3747	....	Mouse River, Dak...	Sept. 12, 1873	Elliott Coues.	.....	.....	.....	Skin.
3855	....	....do	Oct. 1, 1873	....do	7.60	13.90	4.50	....do.
3856	....	....do	.....do	....do	7.40	13.75	4.50	....do.
3857	....	....do	.....do	....do	7.30	13.50	4.30	....do.
4097	....	Porcupine R., Mont.	June 29, 1874	....do	.....	.....	.....	Skin, hairy (young).
4150	....	Frenchman's River, Mont.	July 7, 1874	....do	.....	.....	.....	Skin.
4151	....	....do	.....do	....do	.....	.....	.....	....do.
4157	♂	....do	July 8, 1874	....do	.....	.....	.....	....do.
4158	....	....do	.....do	....do	.....	.....	.....	....do.
4159	....	....do	.....do	....do	.....	.....	.....	....do.
4245	♀	Two Forks Milk R., Mont.	July 18, 1874	....do	.....	.....	.....	Skin (parent of eggs, same No.).
4246	....	....do	.....do	....do	.....	.....	.....	Skin.
4247	....	....do	.....do	....do	.....	.....	.....	....do.
4252	....	N'r Two Forks Milk River, Mont.	July 21, 1874	....do	.....	.....	.....	....do.
4253	....	....do	.....do	....do	.....	.....	.....	....do.
4323	....	Sweetgrass Hills, Mont.	Aug. 6, 1874	J. H. Batty...	6.50	14.75	4.00	....do.
4335	....	West of Sweetgrass Hills, Mont.	Aug. 7, 1874	Elliott Coues.	.....	.....	.....	....do.
4345	....	....do	Aug. 8, 1874	....do	.....	.....	.....	....do.
4423	....	....do	Aug. 12, 1874	....do	.....	.....	.....	....do.
4424	....	....do	.....do	....do	.....	.....	.....	....do.
4464	....	Headwaters Milk R., Mont.	Aug. 15, 1874	....do	.....	.....	.....	....do.
4470	....	....do	.....do	....do	.....	.....	.....	....do.
4471	....	....do	.....do	....do	.....	.....	.....	....do.
4621	....	Rocky Mts., latitude 49°.	Aug. 26, 1874	J. H. Batty...	.....	.....	.....	....do.
4666	....	West of Sweetgrass Hills.	Aug. 30, 1874	....do	.....	.....	.....	....do.
4667	....	....do	.....do	....do	.....	.....	.....	....do.
4668	....	....do	.....do	....do	.....	.....	.....	....do.
4669	....	....do	.....do	....do	.....	.....	.....	....do.
4674	....	....do	.....do	....do	.....	.....	.....	....do.
4682	....	....do	Aug. 31, 1874	Elliott Coues.	.....	.....	.....	....do.
4683	....	....do	.....do	....do	.....	.....	.....	....do.
4684	....	....do	.....do	....do	.....	.....	.....	....do.
4685	....	....do	.....do	....do	.....	.....	.....	....do.
4686	....	....do	.....do	....do	.....	.....	.....	....do.
4687	....	....do	.....do	....do	.....	.....	.....	....do.
4688	....	....do	.....do	....do	.....	.....	.....	....do.
4689	....	....do	.....do	....do	.....	.....	.....	....do.
4690	....	....do	.....do	....do	.....	.....	.....	....do.

ANTHUS LUDOVICIANUS, (*Gm.*) *Licht.*

TITLARK, OR PIPIT.

In the general area surveyed by the Commission, the Titlark appears to be only a bird of passage, in spring and autumn. During the first season I accompanied the Survey, none were observed until September, when, with arrival of various other species from the north, they made their appearance in considerable numbers along the Mouse River. The following season, however, I found them in August about Chief Mountain Lake, and do not doubt that those then observed were bred in the immediate vicinity, as at that time the fall migration had not commenced. In the Eastern Province, the Pipit agrees closely with the Horned Lark in its distribution during the breeding-season; in the

West, however, the case is reversed, the *altitudes* at which it nestles being complementary to the latitude it elsewhere seeks for the same purpose. It nests abundantly in the Rocky Mountains, above timber-line, along with the Ptarmigan, as first determined by Mr. J. A. Allen, and subsequently very fully set forth by Mr. T. M. Trippe, at pp. 231, 232, of the "Birds of the Northwest". Its general habits as observed in the West furnish no occasion for special comment.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3704	....	Mouse River, Dak ..	Sept. 2, 1873	Elliott Coues.	6. 60	10. 40	3. 20	Skin.
4638	....	Rocky Mountains, latitude 49°.	Aug. 29, 1874	....do	.....	.....	.....	....do.
4639	....	...do	.....do	....do	.....	.....	.....	...do.

NEOCORYS SPRAGUII, (*Aud.*) *Scl.*

Missouri Skylark.

This very interesting bird, which in this country represents the celebrated Skylark of Europe, was discovered by Audubon in 1843, during his trip to the Upper Missouri. His type specimen, secured at Fort Union, June 19, is still preserved in the National Museum, having been among the many rare or unique specimens presented by him many years ago to Professor Baird. For about twenty years, no other specimens were forthcoming, and little, if anything more, was heard of the bird until an English officer, Captain Blakiston, met with it in considerable numbers in the Saskatchewan region, and contributed an account of its habits, as observed by him, to the "Ibis", then, as now, one of the very few journals devoted to ornithology. One of his specimens, like Audubon's original, reached the Smithsonian Institution, and remained until recently the only duplicate known to exist in any American collection. During my connection with the Boundary Commission I passed the season of 1873 in the very centre of abundance of the species, and collected over fifty specimens, all of which reached Washington safely and in good condition. Many more could have been secured, but I considered this number sufficient, not only for my own study of the species, but for distribution among other ornithologists, and various public collections in this country and Europe. During the same summer, my friend J. A. Allen, who was similarly engaged in field-work south of me, in the Yellowstone region, in connection with an engineering expedition then in progress, also became familiar with the bird, collected many specimens, and had the good fortune to discover the nest and eggs. These latter, now in the National Museum, are the only specimens, so far as I know, which have come under the notice of naturalists since Audubon first discov-

ered them. I transcribe the account which he courteously furnished me for publication in a different connection:—

"The only nest we found was placed on the ground, and neatly formed of fine dry grass. It was thinly arched over with the same material, and being built in a tuft of rank grass, was most thoroughly concealed. The bird would seem to be a close setter, as in this case the female remained on the nest till I actually stepped over it, she brushing against my feet as she went off. The eggs were five in number, rather long and pointed, measuring about 0.90 by 0.60 inches; of a grayish-white color, thickly and minutely flecked with darker, giving them a decidedly purplish tint."

It is a natural step from the nest and egg to the young. On the 2d of August, 1873, while encamped at Turtle Mountain, I discovered a brood of four newly fledged young birds, and captured the whole family, the mother bird being also secured. The little ones were still unable to fly, and would doubtless have escaped observation had it not been for the anxiety of the parents, whose disturbed actions and querulous complaints led to their detection. The nest was doubtless within a few yards of my tent, but after careful and repeated search I had to give it up. The young birds, upon gaining their first full plumage, differ materially from the adults. The upper parts have a richer cast, owing to the buffy edgings of the feathers; those of the back and scapulars have also narrow, sharp, white tips, forming a set of semicircular markings. The greater coverts and longest inner wing-feathers are likewise broadly white-tipped. The buffy-brown patch formed by the ear-coverts is also more conspicuous than it is in the adults. The under parts, excepting the throat and middle of the belly, are strongly tinged with buff, while the streaks on the breast and sides are large, numerous, and diffuse.

A more exact description of the adults than is usually found in treatises may be here reproduced. The sexes are alike, though the male averages a little larger than the female. In addition to the dimension given in the table which succeeds this article may be given those of other parts. The tail is about $2\frac{1}{3}$ inches; bill $\frac{1}{2}$ an inch along the culmen, which is a little concave toward the base. The bill as a whole is weak, slender, compressed, and acute. Tarsus, measured in front, $\frac{4}{5}$ to $\frac{9}{10}$; hind toe and claw $\frac{4}{5}$ to 1, the variation depending chiefly upon the length of the hind claw, which differs a good deal in different individuals; eye black; feet pale flesh-color (neary colorless); upper mandible black, the lower pale flesh-color; upper parts dark brown streaked with pale gray, the baldness of the pattern corresponding with the size of the feathers, since the streaking constitutes the edging of each one; under parts dull whitish or very pale clay-color, washed with a heavier or lighter shade of brown across the breast and along the sides, these same parts being sharply streaked with blackish; there is also a series of small black streaks on each side of the throat; quills of the wings fuscous, the inner ones and the coverts edged with grayish-white, like the

feathers of the upper parts; outermost two pairs of tail-feathers for the most part white, and the third feather usually also with a touch of white near the end; the middle pair colored like the back. During the wear of the feathers in summer, the bird becomes darker on the upper parts, the grayish-white edgings of the feathers narrower and sharper, and the streaks on the breast become fainter. After the fall moult, the general colors become purer and brighter, with stronger variegation on the upper parts and a ruddier brown wash on the lower. But these variations, however obvious to the ornithologist's eye, do not prevent ready recognition of the species. The bird bears some little resemblance to the common Titlark, its general form being much the same; but the latter never shows the decidedly variegated state of plumage which renders the present species unmistakable.

If I am not mistaken, the range of the Missouri Skylark extends into Minnesota, and I have seen a record to that effect; but I cannot at this moment recall the reference or lay my hand on the article. I did not see the bird in the immediate vicinity of the Red River, and do not think I should have overlooked it had any individuals been breeding about Pembina, where I was every day in the field for more than a month collecting very assiduously. Passing the low range of the Pembina Mountains, however, I at once entered the prairie region, where it was breeding in great numbers, in company with Baird's and the Chestnut-collared Buntings. The first one I shot, July 14, was a bird of the year, already full-grown and on wing, and as I found scarcely fledged young at least a month later, I judge that, like the *Eremophila*, the bird raises two broods a year. Travelling westward to and beyond the second crossing of the Mouse River, no day passed that I did not see numbers of the birds; and at some of our camps, notably that at the first crossing of the Mouse River, they were so numerous that the air seemed full of them; young ones were caught by hand in the camp, and many might have been shot without stirring from my tent, as they hovered overhead on tremulous wings, uttering continuously their sharp querulous cry. They continued abundant through the greater part of September, in which month the renewal of the plumage is completed, and some still remained on the ground until October. Exactly when they migrate, however, and where they go to, or when they return, are equally unknown to me,—not the least singular point in the bird's history is the success with which it has eluded observation during the winter months. It is not to be supposed that so delicate a bird is capable of enduring the rigors of winter in this inclement region; and yet, so far as I know, no one has found it in winter, at which season it surely *ought* one would suppose, to be generally distributed in more southerly portions of the West.*

On reaching Fort Buford the following season, I naturally expected

* A specimen was lately taken at Galveston, Tex., in March, by Mr. George B. Sennett. See this Bulletin, this Vol., No. 1, p. 10.

to find the Skylarks equally abundant; for this was the spot where the original victim fell to Audubon's—rather, I understand, to Mr. Isaac Sprague's—gun. But in this I was disappointed, for in the whole region up to the mouth of the Milk River, I only noticed perhaps a few hundred, and, to my surprise, not a single bird of the kind did I see anywhere along the line of march through the Milk River country, until I came to the headwaters of that river, two or three days' journey from the Rocky Mountains, where, on the 13th of August, a single specimen was secured. There is nothing in the general range of the species to account for this, since the bird, as Mr. Allen has informed us, is common in the Yellowstone region; it must be attributed to some peculiarity of local distribution, or fortuitous default of observation.

The general habits and manners of these birds are very much like those of their nearest allies, the Titlarks. During the breeding-season, as usual, it is dispersed in pairs over the country; but, like many other prairie birds, it has its predilection for certain spots, especially in the vicinity of the streams, where many pairs gather in straggling companies, and loose troops are seen together as soon as the first broods are on wing. Such semi-communism is a conspicuous trait of many species not strictly gregarious; but in the present case, after the duties of incubation are entirely finished, larger flocks, acting upon the same impulses, are frequently observed. Were it not for their great abundance, there would be some trouble in securing large numbers, for there are few birds more difficult to shoot upon the wing, while their colors, assimilating with the rusty herbage of the prairie, effectually conceal them when on the ground. When startled, they rise with a rapid, wayward flight, which often defies the most expert marksman. Their ordinary hovering flight, again, though not rapid, is of the peculiarly devious, desultory, and jerky character which renders a sure aim almost impossible, just as it is in the case of a bat, for instance; the instantaneous snap shot, which is one of the prettiest exhibitions of a sportsman's acquired instincts, is alone likely to be successful. After thus hovering on wing for a time, during which the lisping, plaintive note is continually uttered, the birds are wont to pitch suddenly down to the ground again, often upon the very spot whence they arose, and are then immediately lost to view, even among the scantiest herbage of the prairie. On the ground, as on the wing, their actions are precisely like those of Titlarks: they never hop with both feet, like most kinds of Sparrows, but run with one foot after the other, tripping along with mincing steps, and continually vibrating the tail, which seems as if jointed with an elastic hinge. They have a fancy for frequenting the wagon-roads which cross the boundless expanse of prairie, perhaps finding the worn ruts smoother and easier to walk upon, perhaps attracted by insects which the disturbance of the surface exposes, or by the droppings of the draught animals which have passed along.

But the most interesting portion of the natural history of these birds

is their charming song, and the wonderful soaring action during its delivery. The music is heard only during a brief period—in the love season, when the birds are mating and nesting; at other times they have only the sibilant chirp already noted. The bird soars on high till it is but a speck in the blue ether, even until it is lost to view, and then the matchless song descends as if from another world, while its indescribable effect is heightened by the monotonous and often dreary surroundings of the scene. The song continues with scarcely an intermission for several minutes, before the little performer, setting his wings, glides quietly back to his humble home in the grass; and when, as often happens, several are singing within hearing of each other, the whole air seems filled with melody, and vibrating in accord with the harmonious strains. Such concerts as these, to which I have listened for nearly a month together, are among the most delicious pieces of bird-melody to be heard anywhere, and their memory is to me one of the choicest of the many pleasurable experiences that have been mine in the years I have devoted to my favorite pursuits.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3300	..	20 miles west of Pembina Mts., Dak.	July 14, 1873	Elliott Coues.	6.50	11.25	3.30	Skin.
3302	..	75 miles west of Pembina Mts., Dak.	July 17, 1873	....do	6.30	10.40	3.10	....do.
3314	...	25 miles east of Turtle Mt., Dak	July 18, 1873	...do	6.40	10.50	3.15	....do.
3315	....	....do	.....do	....do	6.50	10.90	3.25	....do.
3316	♂	....do	.....do	...do	6.30	10.50	3.20	....do.
3317	....	... do	.....do	...do	6.60	11.00	3.30	....do.
3318	....	....do	.....do	...do	6.50	10.80	3.20	....do.
3319	♀	....do	.....do	...do	6.40	10.90	3.15	...do.
3397	♀	Turtle Mt., Dak.....	Aug. 2, 1873	....do	6.25	10.25	3.05	Skin (parent of Nos. 3398–3401).
3398	....	....do	.....do	....do	.....	.....	.....	Skin (nestling).
3399	....	....do	.....do	...do	.....	.....	.....	....do.
3400	....	....do	.....do	...do	.....	.....	.....	....do.
3401	....	....do	.....do	...do	.....	.....	.....	....do.
3421	♀	Mouse River, Dak ..	Aug. 9, 1873	....do	6.60	10.75	.....	....do.
3422	♀	....do	.....do	....do	6.75	11.15	.....	Skin.
3423	....	....do	.....do	....do	6.75	11.10	.....	....do.
3424	....	....do	.....do	...do	6.50	10.85	.....	....do.
3425	♂	....do	.....do	....do	6.75	10.90	.....	....do.
3426	♂	....do	.....do	....do	6.80	11.20	.....	....do.
3427	....	....do	.....do	....do	6.50	10.75	.....	....do.
3428	....	....do	.....do	....do	6.70	11.25	.....	....do.
3429	....	....do	.....do	....do	6.60	11.00	.....	....do.
3430	....	....do	.....do	....do	6.30	10.35	.....	....do.
3431	....	... do	.....do	....do	6.50	10.50	.....	....do.
3432	....	....do	.....do	....do	6.50	10.60	.....	....do.
3433	....	....do	.....do	....do	6.50	10.75	.....	....do.
3434	....	....do	.....do	....do	6.35	10.50	.....	....do.
3435	....	....do	.....do	....do	6.75	10.90	.....	....do.
3472	....	... do	Aug. 10, 1873	....do	.....	.....	.....	....do.
3483	....	....do	Aug. 11, 1873	....do	6.80	11.00	.....	....do.
3484	....	....do	.....do	....do	6.70	10.60	.....	....do.
3485	....	....do	.....do	....do	6.50	10.50	.....	....do.
3486	....	....do	.....do	....do	6.50	10.50	.....	....do.
3487	....	....do	.....do	....do	6.70	10.70	.....	....do.
3493	....	....do	Aug. 13, 1873	....do	6.50	10.25	.....	....do.
3494	....	....do	.....do	....do	6.80	11.30	.....	....do.
3495	....	....do	.....do	....do	6.65	10.60	.....	....do.
3496	....	....do	.....do	....do	6.75	11.10	.....	....do.
3497	....	....do	.....do	....do	7.00	11.50	.....	....do.
3498	....	....do	.....do	....do	6.50	10.75	.....	....do.
3499	....	....do	.....do	....do	6.60	10.85	.....	....do.
3500	....	....do	.....do	....do	6.50	10.65	.....	....do.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3501	♂	Mouse River, Dak ..	Aug. 13, 1873	Elliott Coues	6.75	11.25	.....	Skin.
3502	....	....do	.....do	....do	6.65	10.85	.....	....do.
3503	....	....do	.....do	....do	6.75	11.00	.....	....do.
3504	....	....do	.....do	....do	6.65	10.90	.....	....do.
3505	♂	....do	.....do	....do	6.50	11.00	.....	....do.
3506	....	....do	.....do	....do	6.40	10.40	.....	....do.
3542	....	....do	Aug. 19, 1873	....do	.....	.....	.....	....do.
3705	♂	....do	Sept. 2, 1873	....do	6.30	10.80	.....	....do.
3706	....	....do	.....do	....do	6.50	11.20	.....	....do.
3850	....	....do	Oct. 1, 1873	....do	6.50	10.80	3.30	....do.
4440	....	Headwaters Milk River, Mont.	Aug. 13, 1874	....do	6.40	10.50	3.30	....do.

MNIOTILTA VARIA, (*L.*) *Vieill.*

BLACK-AND-WHITE CREEPER.

A single specimen was taken at Pembina, where it probably breeds, though the fact was not ascertained. Not found further west. In the Missouri region, it has not been traced beyond old Fort Pierre, where Dr. Hayden some years since observed it.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2919	....	Pembina, Dak	June 9, 1873	Elliott Coues.	.....	.....	.....	Skin.

HELMINTHOPHAGA PEREGRINA, (*Wils.*) *Cab.*

TENNESSEE WARBLER.

Upon my arrival at Pembina, the beginning of June, I at once perceived that the vernal migration of the present species past this point was about to be concluded. This was evidenced by the great disproportion of the sexes, for out of thirteen specimens secured and examined only three proved to be males. In this case, as in many others, the males lead the van during the migration, the females bringing up the rear a little later. Such preponderance of females, taken among specimens indiscriminately secured, is a pretty sure indication that the migration is in progress; for when the birds stop, and begin breeding, many more of the active and musical males than of the quiet, shy, and unobtrusive females will be likely to be observed, as was strikingly illustrated on the same spot by the Mourning Warblers. Another indication of the rapid progress of the migration was the steady current, so to speak, of these birds that flowed along the waters of the river itself. The general course of the river is nearly due north and south, and it thus forms a convenient and attractive highway of migration, along

which numerous woodland species pass. I accounted for the great abundance of such birds at this point by the fact that the whole country to the westward being open, and, therefore, unsuited to their wants, a condensation, or a sort of thickened, folded-over edge of the species here occurred. As long as the migration lasted, the heavy timber of the river-bottom was filled with the birds in a steady stream. There was no occasion to go in search of specimens; stationing myself in some eligible spot, I had only to take them as they came along, fluttering from tree to tree, pursuing insects with a sharp, scraping note, yet never long delaying their onward course. With the second week in June they had all, so far as I know, passed northward; certainly I found no indication of any remaining to breed in this locality.

The species was not observed further west in this latitude, though it has been traced high up the Missouri by other persons. It was named *Sylvicola missouriensis* in 1858 by Maximilian, the late Prince of Wied.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2778	♀	Pembina, Dak	June 2, 1873	Elliott Coues	5.00	7.75	.....	Skin.
2779	♀	....do	.....do	... do	4.75	7.75	.....	....do.
2819	♀	...do	June 3, 1873	... do	4.75	7.50	.....	....do.
2820	♀	....do	.....do	....do	4.75	7.75	.....	....do.
2821	♂	...do	.....do	... do	4.60	7.70	.....	....do.
2822	♀	...do	.....do	....do	4.90	7.50	.....	....do.
2823	♀	....do	.....do	....do	4.60	7.40	.....	....do.
2824	♀	....do	.....do	... do	4.80	7.50	.....	....do.
2825	♀	....do	.....do	....do	4.70	7.50	.....	....do.
2826	♀	....do	.....do	... do	4.90	7.70	.....	... do.
2827	♀	....do	.....do	....do	4.75	7.40	.....	....do.
2828	♂	....do	.....do	....do	4.90	8.00	.....	....do.
2829	♂	....do	.....do	....do	4.90	7.90	.....	....do.

HELMINTHOPHAGA CELATA, (*Say*) *Bd.*

ORANGE CROWNED WARBLER.

Observed during the fall migration, in September, along the Mouse River, where it was abundant.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3761	....	Mouse River, Dak	Sept. 16, 1873	Elliott Coues	5.20	7.60	2.30	Skin.
3779	....	....do	Sept. 18, 1873	....do	.....	.....	.....	....do.
3780	....	....do	.....do	....do	5.00	7.75	2.40	....do.
3781	....	....do	.....do	....do	4.80	7.50	2.35	...do.
3782	....	....do	.....do	....do	.....	.....	.....	....do.
3794	....	....do	Sept. 19, 1873	... do	.....	.....	.....	....do.
3801	....	....do	Sept. 22, 1873	....do	4.80	7.00	2.30	....do.
3802	....	....do	.....do	....do	5.00	7.60	2.50	....do.
3803	....	....do	.....do	....do	4.90	7.40	2.45	....do.
3840	....	....do	Sept. 30, 1873	....do	4.80	7.60	2.40	....do.

DENDRŒCA ÆSTIVA, (*Gm.*) *Bd.*

YELLOW WARBLER.

This abundant and universally diffused species was observed at various points along the whole line, and in the Missouri region.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2784	♂	Pembina, Dak	June 2, 1873	Elliott Coues.	5.00	7.75	.....	Skin.
2785	♂	....do	.....do	...do	5.10	7.70	.....	....do.
2786	♂	....do	.....do	...do	4.90	7.50	.....	....do.
2813	♀	...do	June 3, 1873	...do	.....	.....	.....	Alcoholic.
2844	♂	....do	June 4, 1873	...do	5.00	7.75	.....	....do.
2845	....	....do	... ..do	...do	.....	.....	....	....do.
2846	...	....do	.....do	...do	4.90	7.60	.....	....do.
2895	....	....do	June 6, 1873	...do	.....	.....	.....	Skin.
3564	...	Mouse River, Dak ..	Aug. 23, 1873	.. do	.....	.....	.....	....do.
4445	♀	Headwaters Milk River, Mont.	Aug. 14, 1874	J. H. Batty...	.....	....	.....	....do.

DENDRŒCA CORONATA, (*Linn.*) *Gray.*

YELLOW-RUMPED WARBLER.

Not observed until about the middle of September, when, during the fall migration, it made its appearance in abundance along the Mouse River, in company with the Snowbirds and other species just come from the north. It is one of the Warblers which, though distinctively belonging to the Eastern Province, occasionally straggles southward by a direct line from the extreme western points which it reaches in Alaska. Drs. Cooper and Suckley found it in Washington Territory; Dr. Hayden, up the Missouri to above old Fort Pierre; and Mr. C. E. Aiken, Mr. T. M. Trippe, and Mr. H. W. Henshaw have each found it in Colorado Territory. Its breeding-range is not a little remarkable: it has been recorded as breeding in Jamaica, as well as in various parts of British America and Alaska, but is not known to nest in the greater part of the intervening country. Similarly, in winter, some individuals endure the rigors of the Middle, if not of some of the Northern, States, while others press on into Central America. No other Warbler, as far as known, has such a peculiar distribution as this.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3768	....	Mouse River, Dak ..	Sept. 16, 1873	Elliott Coues	.....	.....	.....	Skin.
3769	....	....do	.....do	...do	.....	.....	.....	....do.
3783	....	....do	Sept. 18, 1873	....do	.....	.....	.....	....do.

DENDRŒCA AUDUBONI, (*Towns.*) *Bd.*

AUDUBON'S WARBLER.

Audubon's Warbler was only observed in the Rocky Mountains, beyond the eastern foothills of which it is not known to extend. From the Rocky Mountains to the Pacific, it is as abundant, in suitable localities, as the Yellow-rump is in most parts of the East, and its counterpart in habits. The individuals found about Chief Mountain Lake did not appear to be migrating,—in fact, the full movement had not begun at the period of observation,—and the species doubtless breeds in this locality in the heavy pine timber.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4556	....	Rocky Mountains, lat. 49°.	Aug. 22, 1874	Elliott Coues.	.....	.....	.....	Skin.
4557	....	....do	..... do.....	...do	.....	.....	.....	....do.
4558	....	....do	..... do.....	..do	.....	.....	.....	....do.

DENDRŒCA STRIATA, (*Forst.*) *Bd.*

BLACK-POLL WARBLER.

A specimen of this species, procured on Woody Mountain, was observed in the collection made by Mr. G. M. Dawson, geologist of the English Commission.

DENDRŒCA PENNSYLVANICA, (*Linn.*) *Bd.*

CHESTNUT-SIDED WARBLER.

One specimen only of this distinctively Eastern specimen was secured at Pembina,—perhaps its western, if not also nearly its northern, limit. It was not observed beyond the Red River. This is one of the more delicate species of the genus, which regularly breeds little, if any, beyond the Northern States, and entirely withdraws in winter, reaching Central and even South America. I have not found any indication of its occurrence west of the longitude of the Red River in any latitude.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2814	♀	Pembina, Dak	June 3, 1873	Elliott Coues.	5.00	7.70	.....	Skin.

DENDRŒCA MACULOSA, (*Gm.*) *Bd.*

BLACK-AND-YELLOW WARBLER.

Specimen from Woody Mountain, seen in Mr. Dawson's collection.

SIURUS NÆVIUS, (*Bodd.*) *Coues.*

WATER THRUSH.

During the progress of the Northwest Boundary Survey, with which the work of the present Commission connected, the Water Thrush was observed in Washington Territory; and since that time its very general range throughout North America has been demonstrated, though the bird was long supposed to be, like *S. motacilla*, a species of the Eastern Province. A specimen was secured in August west of the Sweetgrass Hills, on the headwaters of Milk River. This was the only individual procured during the expedition, and seemed to be somewhat out of place, since the species frequents, for the most part, moister and better-wooded regions. It was again observed, however, in the undergrowth surrounding some reedy pools near Chief Mountain.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4430	....	West of Sweetgrass Hills, Mont.	Aug. 12, 1874	Elliott Coues	.....	.....	.....	Skin.

GEOTHLYPIS TRICHAS, (*Linn.*) *Cab.*

MARYLAND YELLOW-THROAT.

Observed at Pembina, on Turtle Mountain, and in the Rocky Mountains, but not in the open country between these points. The species is one of general distribution in the United States in all suitable localities, and appears to breed indifferently in any latitude within these limits. The Northern Boundary may be not far from the line of its dispersion in this direction.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2878	♂	Pembina, Dak	June 5, 1873	Elliott Coues	.....	.....	.....	Skin.
3373	♂♀	Turtle Mountain, Dak	July 28, 1873	.. do	.....	.....	.....	....do.
3374	♀	....do	..... do.....	....do	.....	.....	.....	....do.
4620	....	Rocky Mountains, lat. 49°.	Aug. 26, 1874	J. H. Batty...	.....	.....	.....	....do.

GEOTHLYPIS PHILADELPHIA, (*Wils.*) *Bd.*

MOURNING WARBLER.

I was agreeably surprised to find this species, which is rather rare in most Eastern localities, breeding abundantly at Pembina; and I suspect that the Mississippi Valley, rather than the Atlantic seaboard, may be the principal line of migration along which it comes from its winter home in Central America to its breeding resorts along the northern boundary of the United States. At the end of June I found a nest, supposed to be of this species, but the identification was not at all satisfactory. The birds were breeding in June, as I knew by the different actions of the two sexes. The males were in full song, and, contrary to their very secretive habits during most of the year, became rather conspicuous, not only by their singing, but by their custom of leaving the dense shrubbery and undergrowth, in which they usually hide, to mount to the tops of the trees. The females, on the other hand, were extraordinarily quiet and retiring; so much so, that during the whole month I secured not a single specimen, though nearly a dozen males were taken without much difficulty. The birds were only observed in the heavy timber of the river-bottom in this locality, and were not afterward encountered during our progress westward; whence I suppose this is about the limit of their Western dispersion. The species appears to breed in like numbers in various portions of Minnesota, where Mr. T. M. Trippe has found it haunting the tamarack swamps and adjoining damp thickets. He corroborates the habit I have just mentioned of ascending to the tree-tops; and, like myself, was unfortunate in finding no nest, though he frequently saw the old birds feeding their young in the latter part of June and early in July. The song is a loud, clear, and agreeable warble, reiterated with great persistency.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2775	♂	Pembina, Dak	June 2, 1873	Elliott Coues	5.25	7.75	.....	Skin.
2776	♂	....do	..... do.....	.. do	5.30	7.70	.....	....do.
2777	♂	....do	..... do.....	....do	5.25	7.70	.....	....do.
2876	♂	....do	June 6, 1873	... do	5.40	8.10	.....	....do.
2877	♂	.. do	..... do.....	....do	5.30	7.75	....	....do.
2920	♂	.. do	June 9, 1873	....do	5.30	7.90	.....	....do.
2935	♂	...do	June 11, 1873	... do	5.25	7.75	.....	....do.
2968	♂	...do	June 13, 1873	... do	5.50	7.70	.....	....do.
3219	....	...do	June 30, 1873	....do	.....	....	.....	Nest with 1 egg (?).

GEOTHLYPIS PHILADELPHIA MACGILLIVRAYI, (*Aud.*) *Bd.*

MACGILLIVRAY'S WARBLER.

A single specimen was secured in the Rocky Mountains in August. In this latitude at least, the present bird does not appear to approach

the range of its Eastern conspecies within several hundred miles, though further south the two may approach each other more closely. The typical *macgillivrayi*, however, has been recorded from Boxelder Creek, one of the tributaries of the Missouri above the mouth of the Yellowstone.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4581	....	Rocky Mountains, latitude 49°.	Aug. 23, 1874	Elliott Coues.	5.50	7.90	2.50	Skin.

ICTERIA VIRENS, (*Linn.*) *Bd.*

YELLOW-BREASTED CHAT.

No Chats were observed at Pembina, nor anywhere along the parallel of 49°, and it may well be doubted whether the species ever quite reaches this latitude. Its absence from the Red River Valley is in striking contrast to its abundance and general dispersion in the Missouri region, but a comparatively short distance to the southward and much further west. In the Atlantic States it barely reaches into Southern New England. I found it during the second season up the Missouri to beyond the mouth of the Yellowstone.

List of specimens.

Coll. No.	Sex.	L cality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen and remarks.
4022	♂	Big Muddy River, Mont.	June 22, 1874	Elliott Coues	.....	....	.....	Skin.

MYIODIOCTES PUSILLUS, (*Wils.*) *Bp.*

BLACK-CAPPED FLY CATCHING WARBLER.

A species of general distribution in North America, and doubtless occurring at all suitable points along the Line, though only actually observed near the eastern base of the Rocky Mountains.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4449	....	Headwaters Milk River, Mont.	Aug. 14, 1874	J. H. Batty...	....	.....	.....	Skin.

SETOPHAGA RUTICILLA, (*Linn.*) *Sw.*

REDSTART.

Very abundant at Pembina, where it breeds. Early in June, the birds exhibited the incessant activity which marks the mating season, and were conspicuous in the sombre foliage of the dense timber along the river, no less by the brilliancy of their black, white, and red plumage, than by their noisiness and sprightly actions. Their characteristic habits of expanding and flirting the tail, and running sideways along the twigs of trees, and their wonderful agility in the pursuit of flying insects, are all particularly well displayed at this season.

Though I did not myself observe the species further westward along the Line, nor anywhere in the Missouri region, it has been traced by others, especially by Dr. J. G. Cooper, along the Upper Missouri and Milk Rivers, and thence to the Cœur d'Alêne Mountains. It is also known to occur in Colorado and Utah.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2783	♂	Pembina, Dak	June 2, 1873	Elliott Coues	4.75	7.60	.....	Skin.
2804	♀	....do	June 3, 1873	....do	.....	.....	.....	....do.
2805	♀	....do	.....do	....do	.....	.....	.....	....do.
2806	♀	....do	.....do	....do	.....	.....	.....	....do.

HIRUNDO ERYTHROGASTRA HORREORUM, (*Barton,*) *Coues.*

BARN SWALLOW.

I find no specimens of this species entered in my register from Pembina, where, according to my recollection, it was not breeding at the time of my visit, though the family was there well represented by numbers of Cliff and White-bellied Swallows. Nevertheless, Barn Swallows were commonly observed, during July and August, at various points along the Line, nearly to the Rocky Mountains. Eligible breeding-places for this species being few and far between in this country, it is correspondingly uncommon, at least in comparison with its numbers in most settled districts. A small colony of the birds which had located for the summer on a small stream west of the Sweetgrass Hills afforded me an opportunity of observing a curious modification of their nesting-habits, which I believe had not been known until I published a note upon the subject. The nests were built in little holes in the perpendicular side of a "cut-bank",—whether dug by the birds themselves or not I could not satisfy myself, though I am inclined to think that they were. My assistant, Mr. Batty, seemed to feel quite confident in the matter; and the probability is, that if the holes were not wholly made by the birds, they were at least fitted up for the purpose.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
.....	....	Mouse River, Dak..	Aug. 30, 1873	Elliott Coues.	.....	.....	.....	Skin.
4298	....	Crossing of Milk River, Mont.	July 25, 1874	...do	.....	.....	.....	....do.
4388	....	West of Sweetgrass Hills, Mont.	Aug 10, 1874	....do	.....	.....	.....	....do.

TACHYCINETA BICOLOR, (*Vieill.*) *Cab.*

WHITE-BELLIED SWALLOW.

Only observed at Pembina, where it was breeding in small numbers about the Fort, together with large colonies of Cliff Swallows.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3056	♂	Pembina, Dak	June 19, 1873	Elliott Coues.	.....	.....	.....	Skin.

TACHYCINETA THALASSINA, (*Sw.*) *Cab.*

VIOLET-GREEN SWALLOW.

Observed on one occasion (June 26, 1874) on the Upper Missouri near Quaking Ash River.

PETROCHELIDON LUNIFRONS, (*Say*) *Scl.*

CLIFF SWALLOW.

This is the most abundant, generally distributed, and characteristic species of the family throughout the region under consideration. The various streams that cut their devious ways through the prairie afford an endless succession of steep banks exactly suited to its wants during the nesting-season, and at various places great clusters of the curious bottle-nosed mud-nests were found, while the flocks of Swallows which often hung about our camps were mainly composed of this species. At some points, the Bank Swallows were breeding with them; the same banks being peppered with their little round holes, generally in the soft soil just below the surface, while the projecting nests of the Cliff Swallows studded the harder or rocky exposures below. At Fort Pembina, the Cliff Swallows were so numerous as to become a nuisance; their incessant twittering was considered a bore, while the litter they brought and their droppings resulted in a sad breach of military decorum. Nevertheless, it was found almost impossible to dislodge them, and one could not but

admire the courage and perseverance which they displayed in reconstructing or repairing their nests, though these were repeatedly destroyed. In examining scores of nests, I was rather surprised to find how small a proportion were finished into the complete retort-shape, even among those which had not been disturbed. Some were little more than cups, like those of the Barn Swallow, partially arched over, and many were simply conical, while in other details they varied greatly according to the position in which they happened to be fixed or their relations to each other. The laying-season in this latitude is at its height during the second and third weeks in June. Probably only one brood is reared each season. Young birds are on the wing by the middle or latter part of July.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2970	...	Pembina, Dak	June 13, 1873	Elliott Coues	5.90	12.30	.....	Skin.
2971	..	....do	.... do	....do	5.90	12.30	.....	. do.
2994	..	....do	.... do	...do	.....	.....	.....	Egg.
3051	♂	.. do	June 19, 1873	.. do	.....	.....	.....	Skin.
3058	♂	...do	... do	...do	.....	.....	.....	...do.
3116	...	....do	June 22, 1873	....do	.....	.....	.....	Six eggs.
3228	♀	...do	July 7, 1873	....do	.....	.....	.....	Skin.
4296	..	Crossing of Milk River, Mont.	July 25, 1874	...do	.....	.....	.....	....do.
4297	...	....do	... do	...do	.....	.....	.....	....do.

COTYLE RIPARIA, (*Linn.*) *Boie.*

BANK SWALLOW.

In noticing the preceding species, I have already alluded to the present as one of those of general distribution along the Line in summer, breeding in colonies anywhere where the cut-banks of the rivers afford suitable sites for the digging of the holes in which the nests are constructed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2969	....	Pembina, Dak	June 13, 1873	Elliott Coues.	5.30	11.10	.....	Skin.

PROGNE SUBIS, (*Linn.*) *Bairâ*

PURPLE MARTIN.

I was rather surprised to find Martins breeding on Turtle Mountain, having observed none at Pembina. In this locality, where there are, of course, no artificial conveniences for the purpose, they must nest in Woodpeckers' holes and similar cavities of trees, as they do in other parts

of the West where I have observed them. This was the only locality where the species was observed, though it is known to extend into the Saskatchewan region.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3350	...	Turtle Mountain, Dak.	July 23, 1873	Elliott Coues	.....	.....	.....	Skin.

AMPELIS GARRULUS, *Linn.*

BOHEMIAN WAXWING.

The taking of the specimen below tabulated may be regarded as the most interesting single result of the Commission, as far as ornithology is concerned, since it shows that the Waxwing breeds on or very near the boundary of the United States. The individual is a newly fledged bird, in the streaky condition which characterizes the first plumage, and was undoubtedly bred in the immediate vicinity. This inference is confirmed by the fact that at the date of capture, August 19, all the birds of the locality were obviously in their summer home, no migratory movement having begun in any case. The individual was shot on the mountain-side adjoining Chief Mountain Lake, at an altitude of about 4,200 feet, in thick coniferous woods, where it was in company with numbers of *A. cedrorum*. No others were observed, which could hardly have been the case had the species been on its migration.

The Waxwing is one of the birds which longest defied ornithologists to discover its nest and eggs, not only in this country, but even in Europe. In the latter country, its breeding-grounds were first discovered, and the desired specimens secured by Mr. J. Wolley's indefatigable exertions in Lapland in 1856. In America, Messrs. R. Kennicott and R. McFarlane share the credit of the corresponding discovery; the former enthusiastic and accomplished naturalist having taken the nest and egg on the Yukon in 1861, the latter on the Anderson River. The nidification is much the same as that of the common Cedar Bird, and quite similar, though the nest, of course, is larger.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4525	....	Rocky Mountains, latitude 49°.	Aug. 19, 1874	Elliott Coues.	.....	.....	.....	Skin (newly fledged).

AMPELIS CEDRORUM, (*Vieill.*) *Gray.*

CEDAR BIRD; CAROLINA WAXWING.

Not seen at Pembina but found at various other points along the Line, and ascertained to be particularly abundant in the Rocky Mountains. At this locality, two of its conspicuous traits were illustrated, namely, the lateness and the irregularity of its breeding. On the same day, August 19, that I took young birds fully fledged and on wing, a nest containing four eggs was found by one of my assistants, Mr. A. B. Chapin. This might be interpreted upon the supposition that two broods are reared in a season, but I do not think that such was the case in the present instance: the bird is too late a breeder for this, at any rate in such a high latitude, not far from its northernmost limit of its distribution.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3541	♀	Mouse River, Dak ..	Aug. 19, 1873	Elliott Coues.	.....	.....	.....	Skin.
3721	...	...do	Sept. 3, 1873	....do	.....	.....	.....	....do.
3732	....	Long Coteau River, Dak.	Sept. 8, 1873	....do	.....	.....	.....	....do.
4524	....	Rocky Mountains, latitude 49°.	Aug. 19, 1874	....do	.....	.....	.....	Skin (young).
4526	....	...do	..... do.....	A. B. Chapin .	.....	.....	.....	Nest with 4 eggs.
4532	...	...do	Aug. 20, 1874	....do	.....	.....	.....	Skin.
4559	...	...do	Aug. 22, 1874	J. H. Batty...	.....	.....	.....	....do.
4560	....	...do	..... do.....	...do	.....	.....	.....	... do.
4561	...	...do	..... do.....	....do	.....	.....	.....	....do.
4562	....	...do	.... do.....	....do	.....	.....	.....	....do.
4563	....	...do	..... do.....	....do	.....	.....	.....	....do.

VIREO OLIVACEUS, (*Linn.*) *Vieill.*

RED-EYED VIREO.

Abundant at Pembina, where it was breeding in June, and again on the Upper Missouri between Fort Buford and the mouth of the Milk River. Though characteristically a bird of the Eastern Province, it has latterly been traced to the Rocky Mountains and somewhat beyond. The late Dr. C. B. R. Kennerly found it in Washington Territory, and Mr. J. A. Allen at Ogden, Utah.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2807	♂	Pembina, Dak	June 3, 1873	Elliott Coues.	6.30	10.10	.....	Skin.
2808	♂♀	....do	.....do	....do	5.90	9.50	.....	....do.
2809	♂♀	... do	....do	....do	6.25	10.00	.....	....do.
2859	♀	....do	June 5, 1873	....do	6.00	9.70	.....	....do.
2860	♀	....do	.....do	....do	5.90	9.40	.....	....do.
2861	♀	....do	.....do	....do	6.00	9.75	.....	....do.
2889	♂♀	....do	June 6, 1873	....do	6.00	10.30	.....	....do.
2925	♂♀	....do	June 9, 1873	....do	5.75	9.90	.....	....do.
2926	♂♀	....do	.....do	....do	5.90	10.20	.....	....do.
2937	♂	....do	June 11, 1873	....do	.....	.....	.....	....do.
2966	♂	....do	June 13, 1873	....do	.....	.....	.....	....do.

VIREO PHILADELPHICUS, *Cass.*

BROTHERLY-LOVE VIREO.

This appears to be a species which, like the Mourning Warbler and some others, is more abundant in the interior, and especially in the Mississippi Valley, than in the Atlantic States. It was originally described, a few years since, from the vicinity of Philadelphia, as indicated by its name, and has been justly esteemed as rather a rare bird in the Eastern and Middle States, though its great similarity to *V. gilvus* may be a cause of its being partially overlooked. In New England, it has been found on two or three occasions, and Dr. Brewer informed me of its abundance in Wisconsin during the latter part of May. Mr. T. M. Trippe in querying *V. gilvus* as found by him in Minnesota, probably had the present species in view. It undoubtedly breeds about Pembina, in the heavy timber of the river-bottom, but I was not so fortunate as to discover its nest, a circumstance the more to be regretted since neither the nest or eggs have as yet come to light.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2811	♀♂	Pembina, Dak	June 3, 1873	Elliott Coues	5.10	8.50	.....	Skin.
2812		...do	.... do	...do	4.80	7.80	.....	....do.

VIREO GILVUS, (*Vieill.*) *Bp*

WARBLING VIREO.

Observed in abundance at Pembina, and again found at the opposite extremity of the Line, the specimen captured in the Rocky Mountains, however, being probably of the slight variety *swainsoni*. At Pembina, the Warbling Vireo was in full song and breeding in June. A nest found on the 11th of that month was still empty; but in this latitude few of the small insectivorous birds appear to lay before the third week in June.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2810	♀	Pembina, Dak	June 3, 1873	Elliott Coues	5.60	8.50	.....	Skin.
2890	♀♂	....do	June 6, 1873	....do	6.00	9.10	.....	....do.
2923	♀	....do	June 9, 1873	....do	5.30	8.60	.....	....do.
2933	....	....do	June 11, 1873	....do	.....	.....	.....	Nest.
4519	....	Rocky Mountains, latitude 49°.	Aug. 19, 1874	....do	.....	.....	.....	Skin (var. *swainsoni*).

VIREO SOLITARIUS, (*Wils.*) *Vieill.*

SOLITARY VIREO.

One specimen of this rather rare species was secured at Pembina, which is probably about its northern limit. It was taken in the timber of the river-bottom, frequented by three other species of the same genus.

A fifth species of Vireo, the White-eyed, probably also occurs in the same locality, since it has been found in Minnesota. It was not, however, observed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2839	....	Pembina, Dak	June 4, 1873	Elliott Coues	5.50	9.25	.....	Skin.

COLLURIO LUDOVICIANUS EXCUBITORIDES, (*Sw.*) *Coues.*

WHITE-RUMPED SHRIKE.

This is the characteristic species of the whole region explored,—the larger kind, *C. borealis*, probably only occurring during its migration to or from the north, and in winter; at any rate, it was not observed. The White-rumped Shrike is common in suitable localities, and numerous specimens were secured at different points. At Turtle Mountain, during the last week in July, I found a family of these birds in an isolated clump of bushes. The young, four in number, had just left the nest, which was discovered in the crotch of a bush, five or six feet from the ground. It was one of the dirtiest nests I have ever handled, being fouled with excrement, and with a great deal of a scurfy or scaly substance, apparently cast from the feathers of the young during their growth. The nest proper rested upon a bulky mass of interlaced twigs; it was composed of some white weed that grew abundantly in the vicinity, matted together with strips of fibrous bark.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2774	♂	Pembina, Dak	June 1, 1873	Elliott Coues	.....	.....	.....	Skin.
2983	♂♀	....do	June 14, 1873	....do	8.60	12.40	.....	....do.
2984	♀	....do	.....do	....do	8.60	12.40	.....	....do.
3385	....	Turtle Mountain, Dak.	July 30, 1873	....do	.....	.....	.....	....do.
3386	....	....do	.....do	....do	.....	.....	.....	....do.
3387	....	....do	.....do	....do	.....	.....	.....	....do.
3391	....	....do	July 31, 1873	....do	.....	.....	.....	....do.
4506	....	Rocky Mountains, latitude 49°.	Aug. 17, 1874	....do	.....	.....	.....	....do.
4640	....	....do	Aug. 29, 1874	....do	.....	.....	.....	....do.

CARPODACUS PURPUREUS, (*Gm.*) *Gray.*

PURPLE FINCH.

This species was found in small numbers on Turtle Mountain during the latter part of July. It doubtless breeds in this locality. It has been traced by other observers as far as the region of the Saskatchewan, but I did not find it in the Rocky Mountains, nor, indeed, anywhere along the Line, excepting in the locality just mentioned. In the Missouri region, I have ascertained that it ascends the river as far at least as Fort Randall,—how much further I am unable to say; the evidence of its presence above that point being negative, with the exception of Dr. Hayden's record of a specimen from Vermilion River.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3368	♀	Turtle Mountain, Dak.	July 28, 1873	Elliott Coues	.....	.....	.....	Skin.

CHRYSOMITRIS TRISTIS, (*Linn.*) *Bp.*

AMERICAN GOLDFINCH.

This familiar bird was noted only at Pembina. It is, however, a species of general distribution in North America, so that the lack of observation respecting it at other points is to be regarded as simply fortuitous.

While upon the small subgroup of the *Fringillidæ* to which the present species belongs, I may properly note some other kinds which undoubtedly belong to the avifauna of the Boundary Line, though they escaped my observation. These are chiefly winter visitors from the north,—for it will be remembered that I was in the field, during both seasons, only from June to October.

The Pine Grosbeak, *Pinicola enucleator*, the two Cross-bills, *Loxia americana* and *L. leucoptera*, the Gray-crowned finch, *Leucosticte tephrocotis*, and the Red-poll Linnet, *Ægiothus linaria*, all enter this country later in the fall, some to remain during winter, others to pass further on; while the Pine Linnet, *Chrysomitris pinûs*, is a species of the same general distribution as the Goldfinch.

Of the genus *Plectrophanus*, next to be considered, all the North American species occur in this region, which is the very home of two of them; two others came southward just as I was leaving, the 1st of October; and the fifth, the Snow Bunting, *P. nivalis*, which was the only one not seen, doubtless came along shortly afterward.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2830	♂	Pembina, Dak	June 4, 1873	Elliott Coues	5.10	9.00	.....	Skin.

PLECTROPHANES LAPPONICUS, (*Linn.*) *Selby.*

LAPLAND LONGSPUR.

On one of the last occasions when, during the season of 1873, I used my gun for collecting, a single specimen of the Lapland Longspur was secured. I think that the species had just reached the parallel on its southward movement; otherwise I could hardly have failed to observe it sooner, as I was shooting almost every day. Exactly how far south it may linger to breed I do not know, but there are some indications that it may occasionally nest in this latitude. Nevertheless, it ordinarily reaches the Arctic regions in summer; and I have seen the nest and eggs from an island in Behring's Sea. It moves southward in October in large flocks, reaching at least as far as Kentucky and Colorado. It does not appear to have been found in the United States west of the Rocky Mountains, but this may be merely through default of observation, since it is a species of circumpolar distribution, like the Snow Bunting, abundant in northern portions of Asia and Europe. Such casual observations as I made when the specimen was secured showed nothing specially different in its habits from either *P. pictus* or *P. ornatus*, with both of which it was associated.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3851	....	Mouse River, Dak...	Oct. 1, 1873	Elliott Coues	6.50	11.25	3.70	Skin.

PLECTROPHANES PICTUS, *Sw.*

PAINTED LONGSPUR.

Observed only on one occasion, when it was found in company with the Chestnut-collared and Lapland Longspurs, having probably, like the last species, just arrived from the north. The two autumnal (young) specimens secured closely resemble the corresponding plumage of *P. ornatus*, though the birds are readily distinguished by certain marks. *P. pictus* is the larger of the two (length, 6.50; extent, 11.25; wing, 3.75; tail, 2.50; tarsus, 0.75; middle toe and claw the same). Upper parts much as in the adults in summer, but the distinctive head-markings obscure

or wanting. Entire under parts buff or rich yellowish-brown, paler on the chin and throat, which, like the forebreast, are obsoletely streaked with dusky. Tibiæ white. Two or three outer feathers of the tail only white. Bill dusky-brown above and at the end, paler below. Feet light brown, toes darker. In no stage of plumage of *P. ornatus* are the under parts extensively buffy, while all the tail-feathers, excepting perhaps the middle pair, are white at the base.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3853	♂	Mouse River, Dak...	Oct. 1, 1873	Elliott Coues	6.50	11.20	3.75	Skin.
3854	♀	....do	.....do	....do	6.40	11.00	3.55	....do.

PLECTROPHANES ORNATUS, *Towns.*

CHESTNUT-COLLARED LONGSPUR.

These birds were not noticed in the immediate valley of the Red River; but no sooner had I passed the Pembina Mountains than I found them in profusion. Throughout this part of the country they are wonderfully abundant, even exceeding in the aggregate either Baird's Bunting or the Missouri Skylark. Their numbers continued undiminished to the furthest point reached by my party during the first season—the headwaters of Mouse River—and they were still in the country when I left, the second week in October. The next season I noticed but few along the Upper Missouri and Lower Milk River, where P. *maccowni* became abundant; they were more common along Frenchman's River, but some little distance further westward I lost sight of them, and in a letter transmitted to the "American Naturalist", from the Two Forks of Milk River, I was induced to suppose I had got beyond their range; this, however, proved not to be the case, for subsequently I saw them at intervals till I entered the foothills of the Rocky Mountains. The interesting relation between the habitat of this species and of *P. maccowni* is more fully expressed under head of the latter; here I will only advert to its great abundance in the whole Red River watershed west of that river itself, its sudden falling-off in numbers at the point where the Coteau de Missouri crosses 49°, yet its persistence westward to the Rocky Mountains.

My first specimens were secured July 14, 1873, at which date the early broods were already on wing. Uniting of several families had scarcely begun, however, nor were small flocks made up, apparently, till the first broods had, as a general thing, been left to themselves, the parents busying themselves with a second set of eggs. Then straggling troops, consisting chiefly of birds of the year, were almost continually seen, mixing freely with Baird's Buntings and the Skylarks; in fact, most of the con-

gregations of the prairie birds that were successively disturbed by our advancing wagon-trains consisted of all three of these, with a considerable sprinkling of Savanna Sparrows, Shore Larks, and Bay-winged Buntings. The first eggs I secured were taken July 18, nearly a week after I had found young on wing; these were fresh; other nests examined at the same time contained newly hatched young. Again, I have found fresh eggs so late as the first week in August. During the second season, the first eggs were taken July 6, and at that time there were already plenty of young birds flying. The laying-season must consequently reach over a period of at least two months. I was not on the ground early enough to determine the commencement exactly; but supposing a two weeks' incubation, and about the same length of time occupied in rearing the young in the nest, the first batches of eggs must be laid early in June to give the sets of young which fly by the first of July. There is obviously time for the same pair to get a second, if not a third, brood off their hands by the end of August; I should say that certainly two, and probably three, broods are reared, as a rule. The result of all this is, that from the end of June until the end of August young birds in every state of plumage, and the parents in various degrees of wear and tear, are all found together. The young males very soon show some black on the under parts, but do not gain the distinctive head-markings until the next season. The completion of general moult is delayed until September, to nearly the time the Prairie Chickens have theirs; with its completion, both old and young acquire a much clearer and richer plumage than that worn during the summer. While the summer adults rarely show the bend of the wing black, this feature comes out strongly in September. Comparatively few of the birds of this region show the mahogany-color on the under parts, described as being very conspicuous in those of some other portions of the country. Many of the females, in high plumage, are scarcely distinguishable from the males. The extent of white on the tail is a conspicuous feature when the birds are flying, serving for their instant recognition among their allies. There is a good deal of variation in dimensions, as indicated by the measurements given in the table beyond.

The nest, of course, is placed on the ground, usually beneath some little tuft of grass or weeds, which effectually conceals it. Like that of other ground-building sparrows, it is sunk flush with the surface of the ground, thin at the bottom, but with thicker and tolerably firm brim; it consists simply of a few grasses and weed-stems, for the most part circularly disposed. In size, the cup is about 3½ inches across the brim and nearly 2 in depth. During the first season, I only found four eggs or young in a nest; but I afterward took one containing six eggs. These measure about $\frac{4}{5}$ long by $\frac{3}{5}$ broad, of an ordinary shape. They are difficult to describe as to color, for the marking is intricate as well as very variable here as elsewhere in the genus. I have called them "grayish-white, more or less clouded and mottled with pale

purplish-gray, which confers the prevailing tone; this is overlaid with numerous surface markings of points, scratches, and small spots of dark brown, wholly indeterminate in distribution and number, but always conspicuous, being sharply displayed upon the subdued ground color." On those occasions when I approached a nest containing eggs, the female usually walked off quietly, after a little flutter, to some distance, and then took wing; at other times, however, when there were young in the nest, both parents hovered close overhead, with continuous cries.

During the summer, when the old birds are breeding, and those of the year are still very young, they are very familiar and heedless, and will scarcely get out of the way. In September, when the large flocks make up, and are joined by *P. pictus* from the north, they become much wilder, fly more strongly, and are then procured with some difficulty. I never observed the dense flocking that some writers describe; the congregation I always found to be a straggling one, so that single birds only could be shot on the wing. In the winter, however, or during the migration, the case may be different. The ordinary flight is perfectly undulatory, and not very rapid; but in the fall the birds have a way of tearing about, when startled, with a wayward course, which renders them difficult to shoot on the wing. The ordinary call-note is a chirp, of peculiar character, but not easy to describe; besides this, the males during the breeding-season have a pleasing twittering song, uttered while they are flying. The chirp is usually emitted with each impulse of the wings. The birds scatter indiscriminately over the prairie, but are particularly fond of the trails made by buffalo or by wagon-trains, where they can run without impediment, and where doubtless they find food which is not so accessible upon undisturbed ground. Though so generally distributed, there are some spots where they are particularly numerous, and others again, where, for no assignable reason, they are not to be seen. This curious sort of semi-colonization is witnessed in the cases of many other prairie birds, and some of the smaller rodent mammals, like the pouched gophers and field-mice.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3255	....	20 miles west Pembina Mts.	July 14, 1873	Elliott Coues.	5.90	10.70	.....	Skin.
3256	....	....do	.....do	....do	5.75	10.30	.....	....do.
3257	....	....do	.....do	....do	5.80	10.40	.....	....do.
3258	....	....do	.....do	....do	6.00	10.65	.....	....do.
3259	....	....do	.....do	....do	5.75	10.00	.....	....do.
3261	....	....do	.....do	....do	5.70	10.15	.....	....do.
3262	....	....do	.....do	....do	5.75	10.00	.....	....do.
3286	....	50 miles west Pembina Mts.	July 15, 1873	....do	6.00	10.50	.....	....do.
3287	....	....do	.....do	....do	6.20	10.60	.....	....do.
3297	....	....do	July 16, 1873	....do	5.80	9.60	.....	....do.
3327	♀	25 miles east Turtle Mt.	July 18, 1873	....do	.....	.....	.....	Skin, with nest and 4 eggs.
3328	♂	....do	.....do	....do	.....	.....	.....	Skin.
3329	♂	....do	.....do	....do	.....	.....	.....	....do.
3330	....	....do	.....do	....do	.....	.....	.....	....do.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3331	...	25 miles east Turtle Mt.	July 18, 1873	Elliott Coues.	.....	.....	.....	Skin.
3332	....	....do	....do	....do	.....	.....	.....	....do.
3333	....	....do	....do	....do	.....	.....	.....	....do.
3447	....	Moose River, Dak...	Aug. 9, 1873	....do	.....	.....	.....	....do.
3448	....	....do	....do	....do	.....	.....	.....	....do.
3449	....	....do	....do	....do	.....	.....	.....	....do.
3450	....	....do	....do	....do	.....	.....	.....	....do.
3453	....	... do	Aug. 10, 1873	....do	.....	.....	.....	Skin (young).
3465	♀	....do	....do	....do	5.75	10.25	.....	Skin.
3466	....	....do	....do	....do	5.80	10.35	.....	....do.
3467	....	....do	....do	....do	6.25	10.75	.....	....do.
3468	....	....do	....do	....do	.....	.....	.....	....do.
3469	....	....do	....do	....do	.....	.....	.....	....do.
3470	....	....do	....do	....do	.....	.....	.....	....do.
3473	....	....do	....do	....do	.....	.....	.....	....do.
3474	....	....do	.... do	....do	6.00	10.25	.....	....do.
3492	....	....do	Aug. 11, 1873	....do	6.00	10.50	.....	....do.
3516	....	....do	Aug. 13, 1873	....do	6.25	10.90	.....	....do.
3517	....	....do	....do	....do	6.10	10.65	.....	....do.
3518	....	....do	....do	....do	6.30	11.00	.....	....do.
3519	....	....do	....do	....do	6.10	10.60	.....	....do.
3520	...	....do	....do	....do	5.90	10.25	.....	....do.
3521	....	....do	....do	....do	.....	.....	.....	....do.
3522	....	....do	....do	....do	.....	.....	.....	....do.
3523	....	....do	....do	....do	.....	.....	.....	....do.
3524	...	....do	....do	....do	.....	.....	.....	....do.
3525	....	....do	....do	....do	.....	.....	.....	....do.
3552	....	....do	Aug. 22, 1873	....do	.....	.....	.....	... do.
3568	....	....do	Aug. 23, 1873	....do	.....	.....	.....	....do.
3569	....	....do	....do	....do	.....	.....	.....	....do.
3588	....	....do	Aug. 27, 1873	....do	.....	.....	.....	....do.
3709	♂	....do	Sept. 2, 1873	....do	6.25	10.80	3.30	....do.
3710	♂	....do	....do	....do	6.25	10.80	3.30	....do.
3711	♀	....do	....do	....do	5.90	10.35	3.20	....do.
3712	....	....do	....do	....do	.....	.....	.....	...do.
3713	♀	....do	....do	....do	5.80	10.20	3.20	....do.
3714	....	....do	....do	....do	5.50	10.10	3.10	....do.
3715	....	....do	....do	....do	.....	.....	.....	....do.
3722	....	....do	Sept. 3, 1873	....do	.....	.....	.....	....do.
3723	....	....do	....do	....do	.....	.....	.....	... do.
3724	....	....do	....do	....do	.....	.....	.....	....do.
3725	....	....do	....do	....do	.....	.....	.....	....do.
3726	....	....do	....do	....do	.....	.....	.....	....do.
3733	♂	Long Coteau River, Dak.	Sept. 8, 1873	....do	6.10	10.70	3.40	....do.
4137	♂	Frenchman's River, Mont.	July 6, 1874	....do	.....	.....	.....	....do.
4138	♀	....do	....do	....do	.....	.....	.....	Skin, with set of 6 eggs.
4140	♂	....do	July 7, 1874	....do	.....	.....	.....	Skin.
4141	♂	....do	....do	....do	.....	.....	.....	....do.
4142	♂	....do	....do	....do	.....	.....	.....	....do.
4143	♂	... do	....do	....do	.....	.....	.....	....do.
4144	♀	....do	....do	....do	.....	.....	.....	....do.
4145	....	....do	....do	....do	.....	.....	.....	....do.
4146	....	....do	....do	....do	.....	.....	.....	....do.
4165	♂	....do	July 8, 1874	....do	.....	.....	.....	....do.
4166	♂	....do	....do	....do	.....	.....	.....	....do.
4167	♂	....do	....do	... do	.....	.....	.....	....do.
4168	♂	....do	....do	....do	.....	.....	.....	....do.
4169	♂	....do	....do	....do	.....	.....	.....	....do.
4170	♂	....do	....do	... do	.....	.....	.....	....do.
4171	♀	....do	.... do	....do	.....	.....	.....	....do.
4172	....	....do	....do	....do	.....	.....	.....	....do.
4173	....	....do	....do	....do	.....	.....	.....	....do.
4293	....	Crossing of Milk River, Mont.	July 25, 1875	....do	.....	.....	.....	....do.
4294	....	....do	....do	....do	.....	.....	.....	....do.
4300	....	....do	....do	....do	.....	.....	.....	....do.
4404	....	West Sweetgrass Hills, Mont.	Aug. 11, 1874	....do	.....	.....	.....	....do.
4432	....	Headwaters Milk River, Mont.	Aug. 13, 1874	J. H. Batty ..	5.75	10.25	3.25	....do.
4434	....	....do	....do	....do	.....	.....	.....	....do.

PLECTROPHANES MACCOWNI, *Lawr.*

BLACK-BREASTED LONGSPUR.

This species was never seen in the Red River region, and I do not think it occurs in that watershed, which is so thickly populated in summer with *P. ornatus*, as already described. It seems to be one of the many birds that mark the natural division between that region and the Missouri Basin. I first encountered it June 21, 1874, a day's march above Fort Buford. The specimen obtained was a young one, not quite able to fly. As we progressed toward the Milk River, the bird grew more and more abundant, and it occurred throughout the country thence to the Rocky Mountains. There were some points on the route where it was scarcely to be seen (as is usually the case with the small prairie birds); but this was a matter of slight local distribution, for the species was equally numerous, "in spots," throughout the country. *P. ornatus* accompanied it in some numbers about as far as Frenchman's River, where both species were breeding, and a few stragglers were noted along the whole way; but, in spite of this admixture, *P. maccowni* is to be considered the characteristic species of the genus in the Missouri watershed at this latitude, just as *P. ornatus* is in that of the Red River.

Maccown's Longspur was very abundant in the country about Frenchman's River, and equally so about the headwaters of Milk River and in the eastern foothills of the Rocky Mountains. It does not appear, however, to enter the mountains themselves, but stops just short of the beginning of the trees,—just where the *Spermophili* give way to the *Geomyidæ* and the Badgers to the Woodchucks. Of its periods of nidification and laying I am less precisely informed than in the case of *P. ornatus*. The fledgling taken June 21 indicates an early June brood, corresponding to the first one of *P. ornatus;* but I took no eggs after July 10, when the only set in the collection was secured. Young birds in all stages were common from this time until the latter part of August, and I have no doubt that at least two broods are reared each season. The nidification is substantially the same as that of *P. ornatus*. The few sets of eggs I have examined are of the same size as those of the bird just named, and closely resemble the lighter-colored varieties of the latter. The ground-color, however, is dull white, without the purplish-gray clouding so noticeable in the eggs of *P. ornatus*. The markings are rather sparse and obscurely mottled, with some heavier, sharper, scratchy ones, all of different shades of brown. According to analogy, it is reasonable to presume upon the same wide range of variation in this case that is known to obtain elsewhere in the genus *Plectrophanes*.

While the females are incubating, the males have a very pretty way of displaying themselves and of letting the music out at the same time. They soar to a little height, and then, fixing the extended wings at an angle of forty-five degrees with their bodies, sink slowly down to the

ground, singing most heartily—"sliding down the scale of their own music," as some one has happily expressed it in the case of another species of similar habit. This song, I think, is superior to that of the Chestnut-collared Bunting, though of the same general character. When hovering in the manner just indicated, both birds resemble butterflies,—there is something so light, wayward, and flickering in their motions.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4010	....	Big Muddy River, Mont.	June 21, 1874	Elliott Coues	.....	.....	.....	Skin (nestling).
4147	♂	Frenchman's River, Mont.	July 7, 1874	....do	6.25	11.25	3.50	Skin.
4148	♂	....do	.....do	....do	6.20	11.50	3.45	....do.
4149	♂	....do	.....do	....do	6.00	11.10	3.40	....do.
4160	♂	....do	July 8, 1874	....do	6.00	11.50	3.60	....do.
4161	♂	....do	.....do	....do	.....	.....	.....	....do.
4162	♂	....do	.....do	....do	6.30	11.60	3.60	....do.
4163	♂	....do	.....do	....do	6.00	11.00	3.40	....do.
4164	♀	....do	....do	....do	5.75	10.70	3.30	....do.
4218	♂	Near Frenchman's River, Mont.	July 10, 1874	....do	.....	.....	.....	Skin, with 4 eggs.
4227	♂	Two Forks of Milk River.	July 16, 1874	....do	.....	.....	.....	Skin (parent of young in alcohol).
4228	♀	....do	.....do	....do	.....	.....	.....	....do.
4241	♂	....do	July 18, 1874	....do	....	.....	.....	Skin.
4242	♀	....do	.....do	....do	.....	.....	.....	....do.
4243	....	....do	.....do	....do	.....	.....	.....	....do.
4244	....	....do	.....do	....do	.....	.....	.....	....do.
4249	....	....do	.....do	....do	.....	.....	.....	....do.
4254	♀	Near Two Forks of Milk River.	July 21, 1874	....do	.....	.....	.....	....do.
4255	....	....do	.....do	....do	.....	.....	.....	....do.
4261	....	Crossing of Milk River, Mont.	July 24, 1874	....do	.....	.....	.....	....do.
4295	....	....do	July 25, 1874	....do	.....	.....	.....	....do.
4330	♂	West of Sweetgrass Hills, Mont.	Aug. 7, 1874	....do	.....	.....	.....	....do.
4331	....	....do	.....do	....do	.....	.....	.....	....do.
4332	....	....do	.....do	....do	.....	.....	.....	....do.
4333	....	....do	.....do	....do	.....	.....	.....	....do.
4334	....	....do	.....do	....do	.....	.....	.....	....do.
4403	....	....do	Aug. 11, 1874	....do	.....	.....	.....	....do.
4425	♂	....do	Aug. 12, 1874	....do	.....	.....	.....	....do.
4426	♀	....do	.....do	....do	.....	.....	.....	....do.
4427	....	....do	.....do	....do	.....	.....	.....	....do.
4428	....	....do	.....do	....do	.....	.....	.....	....do.
4429	....	....do	.....do	....do	.....	.....	.....	....do.
4441	....	Headwaters Milk River, Mont.	Aug. 13, 1874	J. H. Batty...	.....	.....	.....	....do.
4442	....	....do	.....do	....do	.....	.....	.....	....do.
4443	....	....do	.....do	....do	.....	.....	.....	....do.
4457	....	....do	Aug. 15, 1874	....do	.....	.....	.....	....do.
4458	....	....do	.....do	....do	.....	.....	.....	....do.
4459	....	....do	.....do	....do	.....	.....	.....	....do.
4460	....	....do	.....do	....do	.....	.....	.....	....do.
4461	....	....do	.....do	....do	.....	.....	.....	....do.
4466	....	....do	.....do	Elliott Coues.	.....	.....	.....	....do.
4467	....	....do	.....do	....do	.....	.....	.....	....do.
4468	....	....do	.....do	....do	.....	.....	.....	....do.
4469	....	....do	.....do	....do	.....	.....	.....	....do.
4472	....	....do	.....do	....do	.....	.....	.....	....do.
4473	....	....do	.....do	....do	.....	.....	.....	....do.
4474	....	....do	.....do	....do	.....	.....	.....	....do.
4498	♂	Near Rocky Mountains, lat. 49°.	Aug. 16, 1874	....do	.....	.....	.....	....do.
4499	♂	....do	.....do	....do	.....	.....	.....	....do.
4500	♂	....do	.....do	....do	.....	.....	.....	....do.
4501	♂	....do	.....do	....do	.....	.....	.....	....do.
4502	♀	....do	.....do	....do	.....	.....	.....	....do.
4.28	♀	....do	Aug. 28, 1874	....do	.....	.....	.....	....do.
4629	....	....do	.....do	....do	.....	.....	.....	....do.
4630	....	....do	.....do	....do	.....	.....	.....	....do.
4631	....	....do	.....do	....do	.....	.....	.....	....do.
4632	....	....do	.....do	....do	.....	.....	.....	....do.
4641	♂	....do	Aug. 29, 1874	....do	.....	.....	.....	....do.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4659	....	Headwaters Milk River, Mont.	Aug. 30, 1874	Elliott Coues.	.....	.....	.....	Skin.
4660	....	....do	.....do	....do	.....	.....	.....	....do.
4661	....	....do	.....do	....do	.....	.....	.....	....do.
4662	....	....do	.....do	....do	.....	.....	.....	....do.
4663	....	....do	.....do	....do	.....	.....	.....	....do.
4664	....	....do	.....do	....do	.....	.....	.....	....do.
4665	....	....do	.....do	....do	.....	.....	.....	....do.
4667	♂	West of Sweetgrass Hills, Mont.	Aug. 31, 1874	....do	.....	.....	.....	....do.
4678	♂	....do	.....do	....do	.....	.....	.....	....do.
4679	♂	....do	.....do	....do	.....	.....	.....	....do.
4680	♂	....do	.....do	....do	.....	.....	.....	....do.
4681	♀	....do	.....do	....do	.....	.....	.....	....do.

PASSERCULUS BAIRDI, (*Aud.*) *Coues.*

BAIRD'S BUNTING.

It is difficult to understand how this bird eluded observation for thirty years—from the time of its original discovery by Audubon, on the Upper Missouri, nearly to the present day. If the species were really rare, this would not be remarkable; but it has lately been shown to be extremely abundant in different parts of the West. I did not meet with it along the Red River itself, but found it as soon as I passed from the Pembina Mountains to the boundless prairie beyond. In some particular spots, it outnumbered all the other birds together; and on an average through the country, from the Pembina Mountains to the Mouse River, it was one of the trio of commonest birds,—the Skylarks and Chestnut-collared Longspurs being the other two. The first specimens I procured were taken July 14. Some of them were newly fledged, but the great majority were adult males, showing that at that time the breeding-season was at its height. Out of thirty-one specimens secured July 14 and 15, only one was a female, the individuals of this sex being evidently occupied with the duty of incubating or brooding their young. The males at this time were very conspicuous, like *Spizella pallida* under the same circumstances, as they sat singing on the weeds or low bushes of the prairie. The song consists of two or three distinct syllables, followed by a trill uttered in a mellow, tinkling tone. The nest I never succeeded in finding, although I must have passed by many. The eggs were first discovered by Mr. Allen in the region just south of me. They were taken July 1, 1873, the date corresponding to that which I fixed as the laying season from consideration of the habits of the birds. The nest and eggs are described from his specimens in the "Birds of the Northwest". Whether or not two broods are reared, I cannot say; but some of my late summer specimens were so young that I judged they might belong to a second brood. Birds of apparently about the same age were shot six weeks apart.

The general habits of Baird's Bunting are much like those of *Passerculus savanna*, and the appearance of the two birds during life is so similar that it is difficult to tell them apart at any distance. The *Centronyx* is not truly gregarious, but, like many other prairie birds, affects particular spots, which are colonized by large numbers. When the young are all on wing, it associates in straggling troops, mixing freely with the Skylarks and Longspurs. During the summer, the plumage becomes extremely worn and faded; with the moult, which occurs in September, a much more richly colored dress is assumed. The bird remains in this country at least until October, though its numbers sensibly diminish during the preceding month.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3242	♂	20 miles west Pembina Mts.	July 14, 1873	Elliott Coues.	.....	.....	.....	Skin.
3243	♂	....do	.....do	....do	.....	.....	.....	....do.
3244	♂	....do	.....do	....do	5.25	9.10	.....	....do.
3245	♂	....do	.....do	....do	5.75	9.40	.....	....do.
3246	♂	....do	..... do	....do	5.65	9.20	.....	....do.
3247	♂	....do	.....do	....do	5.50	9.30	.....	....do.
3248	♂	....do	.....do	....do	5.75	9.40	.....	....do.
3249	♂	....do	.....do	....do	5.75	9.45	.....	....do.
3250	♀	....do	.....do	....do	5.50	8.87	.....	....do.
3251	♂	....do	.....do	....do	5.75	9.50	.....	....do.
3252	♂	....do	.....do	....do	5.75	9.50	.....	....do.
3265	♂	50 miles west Pembina Mts.	July 15, 1873	....do	5.10	9.30	.....	....do.
3266	♂	....do	.....do	....do	5.70	9.50	.....	....do.
3267	♂	....do	.....do	....do	5.75	9.70	.....	....do.
3268	♂	....do	.....do	....do	5.50	9.25	.....	....do.
3269	♂	....do	.....do	....do	5.75	9.75	.....	....do.
3270	♂	....do	.....do	....do	5.70	9.70	.....	....do.
3271	♂	....do	.....do	....do	5.60	9.30	.....	....do.
3272	♂	....do	.....do	....do	5.75	9.00	.....	....do.
3273	♂	....do	.....do	....do	5.65	9.50	.....	....do.
3274	♂	....do	.....do	....do	5.65	9.50	.....	....do.
3275	♂	....do	.....do	....do	5.65	9.50	.....	....do.
3276	♂	....do	.....do	....do	5.85	9.60	.....	....do.
3277	♂	....do	.....do	....do	5.80	9.50	.....	....do.
3278	♂	....do	.....do	....do	5.75	9.40	.....	....do.
3279	♂	....do	.....do	....do	5.50	9.45	.....	....do.
3280	♂	....do	.....do	....do	5.75	9.50	.....	....do.
3281	♂	....do	.....do	....do	5.40	9.35	.....	....do.
3282	♂	....do	.....do	....do	5.65	9.35	.....	....do.
3283	♂	....do	.....do	....do	5.30	9.00	.....	....do.
3284	♂	....do	.....do	....do	5.60	9.50	.....	....do.
3290	....	....do	July 16, 1873	....do	.....	.....	.....	....do.
3291	....	....do	.....do	....do	5.50	9.35	.....	....do.
3292	....	....do	.....do	....do	5.65	9.70	.....	....do.
3293	....	....do	.....do	....do	5.65	9.30	.....	....do.
3294	....	....do	.....do	....do	5.60	9.40	.....	....do.
3295	....	....do	..... do	....do	5.65	9.30	.....	....do.
3296	....	....do	.....do	....do	5.60	9.60	.....	....do.
3303	....	75 miles west Pembina Mts.	July 17, 1873	....do	5.40	9.50	2.90	....do.
3304	....	... do	.....do	...do	5.75	9.10	2.75	....do.
3305	....	....do	.....do	....do	5.50	9.40	2.80	....do.
3306	....	....do	.....do	... do	5.10	9.10	2.75	....do.
3320	....	25 miles east Turtle Mountain.	July 18, 1873	....do	.....	.....	.....	....do.
3321	....	....do	.....do	....do	.....	.....	.....	....do.
3322	....	....do	.....do	....do	.....	.....	.....	... do.
3323	....	....do	.....do	....do	.....	.....	.....	....do.
3324	....	...do	....do	... do	.....	.....	.....	....do.
3325	...	....do	.....do	...do	.....	.....	.....	....do.
3326	....	....do	....do	....do	.....	.....	.....	....do.
3358	♂	Turtle Mt., Dak....	July 25, 1873	....do	5.25	9.40	.....	....do.
3359	♂	....do	.....do	....do	5.30	9.50	.....	....do.
3436	....	Mouse River, Dak...	Aug. 9, 1875	....do	5.65	9.20	.....	....do.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3437	....	Mouse River, Dak...	Aug. 9, 1875	Elliott Coues	5.50	8.60	.....	Skin.
3438	....	....do	.....do	....do	5.50	9.00	.....	....do.
3439	....	....do	.....do	....do	5.75	9.30	.....	....do.
3440	...	....do	.....do	....do	5.70	9.00	.....	....do.
3441	....	....do	.....do	....do	5.50	9.00	.....	....do.
3464	♀	....do	Aug. 10, 1873	...do	.....	.....	.....	...do.
3488	....	....do	Aug. 11, 1873	....do	5.70	9.00	.....	....do.
3489	....	....do	.....do	....do	5.50	8.85	.....	....do.
3507	....	....do	Aug. 13, 1873	....do	5.80	9.75	.....	....do.
3508	....	....do	.... do	....do	5.50	9.10	.....	....do.
3509	....	....do	.....do	....do	5.65	9.35	.....	....do.
3510	....	....do	.....do	....do	5.65	9.35	.....	... do.
3511	....	....do	....do	....do	5.65	9.30	.....	....do.
3512	....	....do	.....do	....do	5.50	9.25	.....	....do.
3513	....	....do	....do	... do	5.60	9.25	.....	....do.
3514	....	....do	.....do	....do	5.65	9.45	.....	....do.
3515	....	....do	.....do	....do	5.75	9.30	.....	....do.
3849	....	....do	Oct. 1, 1873	....do	5.80	9.60	3.05	....do.

COTURNICULUS LECONTII, (*Aud.*) *Bp.*

LeConte's Bunting.

The rediscovery of this little-known and extremely interesting species in Dakota was made in the season of 1873 by the Commission. On the march between Turtle Mountain and the first crossing of Mouse River, I came upon what seemed to be a small colony of the birds in a moist depression of the prairie, where the herbage was waist-high. By diligent search, after shooting the first specimen and perceiving what it was, I managed, not without difficulty, to secure five in all. This was on the 9th of August. I subsequently found the bird again, and secured a sixth specimen, amongst the reeds of a prairie slough near the headwaters of the river just mentioned. So far as I could determine from short observation, the birds are much like the *Ammodromi* in their general habits and appearance, and they inhabit similar situations. Their note was a chirring noise, like that of a grasshopper. They were started at random from the tall, waving grass, flitted in sight for a few seconds, and then dropped suddenly, so that the chances of shooting them were very poor. One was killed at very close range by a blow from the *wad* of my cartridge, the charge of shot having passed in lump close by. I have no doubt that the birds were breeding in this place, though no nests were found. Their retiring habits and the nature of their resorts have doubtless caused them to be overlooked for years. Audubon says that he found them common on the Upper Missouri. A specimen, in poor condition, from Texas, was the only one known to exist in any collection before these of mine were secured, Audubon's type having been lost or mislaid. A redescription of the species, in which it is shown that the characters originally assigned required modification, is given in the "Birds of the Northwest".

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3442	♂	Mouse River, Dak.	Aug. 9, 1873	Elliott Coues.	5.00	7.10	.....	Skin.
3443	♀	....do	.....do	....do	5.00	7.00	.....	....do.
3444	....	....do	.....do	....do	5.00	6.90	.....	....do.
3445	....	....do	.....do	....do	5.10	6.90	.....	....do.
3446	....	....do	.....do	....do	5.25	.....	.....	....do.
3743	....	Long Coteau River, Dak.	Sept. 9, 1873	....do	.....	.....	.....	....do.

PASSERCULUS SAVANNA, (*Wils.*) *Bp.*

SAVANNA SPARROW.

Breeds in profusion throughout the region explored. Though not exclusively a bird of the prairie, it seems to be as much at home in the open plains as anywhere, associating intimately with *Centronyx* and the two leading species of *Plectrophanes*. It is also found, however, in the brush along the streams and larger rivers, which are unfrequented by the species just named, in company with the *Melospizæ* and *Juncones*. A large *suite* of specimens was taken, a part of it, however, unintentionally, for it is not an easy matter to always distinguish between the Savanna Sparrow and Baird's Bunting at gunshot range; and when I have killed a bird, I generally make a point of preserving it, even though it is not particularly wanted as a specimen, in order that its life may not have been taken in vain. The nest is placed on the ground, simply built of dried grasses, with a lining of horse-hair; the eggs are four or five in number, in this locality usually laid in the first half of June. Like nearly all the Fringilline birds of this region, the Savanna Sparrow is frequently the Cowbird's foster-parent, and in one instance that came under my observation the nest contained two of the alien eggs.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2792	....	Pembina, Dak	June 2, 1873	Elliott Coues	.....	.....	.....	Skin.
2864	....	....do	June 5, 1873	....do	5.20	9.00	.....	....do.
2865	....	....do	.....do	....do	.....	.....	.....	....do.
2883	....	....do	June 6, 1873	....do	.....	.....	.....	....do.
2884	....	....do	.....do	....do	.....	.....	.....	....do.
3254	....	Near Pembina Mountains, Dak.	July 14, 2873	...do	.....	.....	.....	....do.
3263	....	...do	.....do	....do	.....	.....	.....	....do.
3264	....	....do	.....do	....do	.....	.....	.....	....do.
3265	....	....do	.....do	....do	.....	.....	.....	....do.
3343	....	Turtle Mountain, Dak.	July 20, 1873	....do	.....	.....	.....	....do.
3344	....	....do	.....do	....do	.....	.....	.....	....do.
3360	....	....do	July 25, 1873	....do	.....	.....	.....	....do.
3382	....	....do	July 30, 1873	....do	.....	.....	.....	....do.
3497	....	....do	Aug. 8, 1873	....do	.....	.....	.....	....do.
3565	....	Mouse River, Dak ..	Aug. 23, 1873	....do	.....	.....	.....	....do.
3597	....	....do	Aug. 30, 1873	....do	5.60	9.00	2.90	....do.
3707	♂	....do	Sept. 2, 1873	....do	6.00	10.00	3.00	....do.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3708	♀	Mouse River, Dak ..	Sept. 2, 1873	Elliott Coues	5.40	9.00	2.65	Skin.
3734	....	Long Coteau River, Dak.	Sept. 8, 1873	....do	.....	.....	.....	....do.
3831	....	Mouse River, Dak ..	Sept. 27, 1873	....do	.....	.....	.....	....do.
4262	....	Crossing of Milk River, Dak.	July 24, 1874	....do	.....	....	.....	....do.
4263	....	....do	.....do	....do	.....	.....	.....	....do.
4292	....	....do	July 25, 1874	....do	.....	.....	.....	....do.
4401	....	West of Sweetgrass Hills, Mont.	Aug. 11, 1874	....do	.....	.....	.....	....do.
4402	....	....do	.. ..do	....do	.....	.....	.....	....do.
4445	....	Headwaters Milk River, Mont.	Aug. 14, 1874	....do	.....	.....	.....	....do.
4463	....	....do	Aug. 15, 1874	....do	.....	.....	.....	....do.
4476	....	Rocky Mountains, latitude 49°.	Aug. 16, 1874	....do	.....	.....	.....	....do.
4616	....	....do	Aug. 26, 1874	J. H. Batty...	.....	.....	.....	....do.
4617	....	....do	.....do	....do	.....	.....	.....	....do.

POŒCETES GRAMINEUS, (*Gm.*) *Bd.*

Bay-winged Bunting, or Grass Finch.

Like the last, the present species extends over the whole region explored, and breeds in abundance, while the general remarks upon distribution made in the case of the Savanna Sparrow are equally applicable here. Several nests were found at Pembina, containing eggs, about the middle of June. One of them also held two *Molothrus* eggs. The nests were built in open ground, quite deeply sunken, so as to be flush with the surface, and more substantial than those of many ground-builders, the walls being an inch or more thick at the brim. The cavity is small and deep in comparison with the whole nest. The usual materials are grasses and weed-stalks, the coarser material outside, the finer fibres within and at the bottom. The eggs, of which I have not found more than four, measure about 0.80 by 0.55; they are grayish-white, heavily marked all over with spots, dashes, and blotches of reddish-brown, and sprinkling of fine dots of the same or darker brown. The female is a close setter, not leaving the nest until nearly trodden upon, and then fluttering off as if crippled, to distract attention from the nest to herself.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2866	♀	Pembina, Dak	June 5, 1873	Elliott Coues.	.....	.....	.....	Skin.
2959	♀	....do	June 13, 1873	....do	.....	.....	.....	Skin, nest, and 4 eggs.
3045	....	....do	June 19, 1873	....do	.....	.....	.....	Nest, with 3 eggs, and 2 of *Molothrus*.
3340	....	Turtle Mountain, Dak.	July 20, 1873	....do	.....	.....	.....	Skin.
3341	....	....do	.....do	....do	.....	.....	.....	....do.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3342	....	Turtle Mountain, Dak.	July 20, 1873	Elliott Coues	.....	.....	.....	Skin.
3349	....	....do	July 23, 1873	....do	.....	.....	.....	....do.
3393	....	....do	Aug. 2, 1873	....do	.....	.....	.....	....do.
3596	....	Mouse River.....	Aug. 30, 1873	....do	.....	.....	.....	....do.
3730	....	Long Coteau River, Dak.	Sept. 8, 1873	....do	.....	.....	.....	....do.
3731	....	....do	.....do	....do	.....	.....	.....	....do.
4021	♂	Big Muddy River, Mont.	June 22, 1874	....do	.....	.....	.....	....do.
4032	....	Quaking Ash River, Mont.	June 26, 1874	....do	.....	.....	.....	....do.
4033	....	....do	.....do	....do	.....	.....	.....	....do.
4261	....	Crossing of Milk River, Mont.	July 24, 1874	....do	.....	.....	.....	....do.
4340	....	West of Sweetgrass Hills, Mont.	Aug. 8, 1874	....do	.....	.....	.....	....do.
4448	....	Headwaters Milk River, Mont.	Aug. 14, 1874	J. H. Batty...	.....	.....	.....	....do.
4450	....	....do	.....do	....do	.....	.....	.....	....do.
4465	....	....do	Aug. 15, 1874	....do	.....	.....	.....	....do.
4497	....	Rocky Mountains, latitude 49°.	Aug. 16, 1874	....do	.....	.....	.....	....do.
4514	....	....do	Aug. —, 1874	Elliott Coues	.....	.....	.....	....do.
4618	....	....do	Aug. 26, 1874	....do	.....	.....	.....	....do.
4619	....	....do	... do	....do	.....	.....	.....	....do.
4633	....	....do	Aug. 28, 1874	....do	.....	.....	.....	....do.

SPIZELLA MONTICOLA, (*Gm.*) *Baird.*

TREE SPARROW.

No Tree Sparrows were observed in summer during either season, and I think none breed so far south as this. They appear in numbers with the general migration which brings the northern Fringillines, and which reaches this latitude about the 1st of October. Unlike several of the other species, however, they are not generally distributed, being confined to the woods, or rather the shrubbery along the streams, where they may be observed in small troops in company with the Snowbirds, and Harris's, Lincoln's, and White-crowned Sparrows. They are hardy birds, capable of enduring great cold, and I suppose that they may pass the winter in this latitude, as they certainly do a little distance southward in the Missouri region. I found them in considerable numbers at Fort Randall, Dak., during the winter of 1872–73, which they passed, to all appearances, very comfortably in the heavy undergrowth of the river-bottom.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3875	....	Mouse River, Dak..	Oct. 5, 1873	Elliott Coues.	.....	.....	.....	Skin.

SPIZELLA SOCIALIS, (*Wils.*) *Bp.*

CHIPPING SPARROW.

Specimens of this very common and familiar species were taken in the Rocky Mountains, and it was observed at other points where none were secured. It is not, however, a conspicuous feature of the avifauna of this region, most of which is not suited to its wants, and even at Pembina the Clay-colored Bunting takes the place which the "Chippy" fills in the East. It is, in fact, absent from the greater part of the country surveyed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4588	....	Rocky Mountains, lat. 49°.	Aug. 23, 1874	Elliott Coues.	.....	.....	.....	Skin.
4598	....	....do	Aug. 24, 1874	.....do	.....	.....	.....	... do.
4599	....	....do	.....do	.....do	.....	.....	.....	...do.

SPIZELLA PALLIDA, (*Sw.*) *Bp.*

CLAY-COLORED BUNTING.

The Western Meadow Lark, Brewer's Blackbird, and the present species were the chief birds I observed at Pembina to indicate an avifauna in any wise different from that of the Eastern Province at large, and two of these cannot be considered very strong marks, since they both occur some distance further eastward. Upon my arrival, the 1st of June, these Buntings were all paired, the males were in full song, nidification was mostly finished, and the eggs were about to be laid. The first specimen procured, June 2, contained a fully formed egg. A nest taken June 5 was scarcely completed. The first complement of eggs was taken June 11; it numbered four. I think the eggs are mostly laid by the end of the second week in June. The nest is placed in bushes, generally within a few inches of the ground. It resembles that of the Chipbird, though it is not so neatly and artistically finished, and often lacks the horse-hair lining, which is so constant and conspicuous a feature of the latter. In size it averages about three inches across outside by two in depth, with a cavity two inches wide and one and a half inches deep. The structure is of fine grasses and slender weed-stalks, with or without some fine rootlets, sometimes lined with hair, like the Chippy's, sometimes with very fine grass-tops. It is placed in a crotch of the bush or in a tuft of weeds. The copses of scrubby willows I found to be favorite nesting-places, though any of the shrubbery along the river-bank seemed to answer. On those occasions when I approached a nest containing eggs, the female fluttered silently and furtively away, without venturing a protest. The eggs I found in one case to be depos-

ited daily till the complement was filled. They measure 0.62 in length by 0.50 in breadth on an average. The ground-color is light dull green, sparsely but distinctly speckled with some rich and other darker shades of brown, these markings being chiefly confined to the larger end, or wreathed about it, though there are often a few specks here and there over the rest of the surface. From the earliness of the first sets of eggs, I suppose that two broods may be reared each season.

The Buntings were very numerous about Pembina, and during the breeding-season became conspicuous from the habit of the males at this season of mounting to the tops of the bushes and singing continually. The song is simple, but voluble and earnest, as if the birds gave the whole of their minds to it—as is doubtless the fact. It consists of three notes and a trill. The song ceases with the end of the breeding-season, when the birds retain nothing but their slight chirp. With its cessation, the characteristic breeding-habit of mounting the bushes is given up, and the birds become less conspicuous, though really more numerous than ever, from the accession of the new broods. They then go in little troops, which haunt all the shrubbery and mix intimately with the other Sparrows which frequent like situations. They are not, however, to be found on the prairie at any considerable distance from woods or shrubby undergrowth. As the season advanced, and during my progress westward, I found them in equal abundance on Pembina and Turtle Mountains and along the Mouse River.

The next season none were noticed in the Upper Missouri country. They cannot be so numerous in this region, for I could hardly have overlooked them altogether. Nevertheless, they extend across the country to the Rocky Mountains, as specimens were procured west of the Sweetgrass Hills.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2790	♀	Pembina, Dak.	June 3, 1873	Elliott Coues.	.....	.....	.....	Skin; contained egg ready for extrusion.
2838	....	....do	June 4, 1873	....do	5.25	7.25	.....	Skin.
2856	♂	....do	June 5, 1873	....do	5.00	7.60	.....	....do.
2857	♂♀	....do	.....do	....do	5.10	7.50	.....	....do.
2858	♂	....do	.... do	....do	5.30	7.60	.....	....do.
2867	....	....do	.....do	....do	.....	.....	.....	Nest; parents Nos. 2857, 2858.
2879	....	....do	June 6, 1873	....do	5.40	7.70	.....	Skin.
2880	♂	....do	.....do	... do	5.50	8.00	.....	....do.
2881	♂	....do	.....do	....do	5.40	7.70	.....	....do.
2882	♂♀	....do	....do	....do	5.20	7.40	.....	....do.
2901	♂	... do	June 7, 1873	....do	5.25	7.75	.....	....do.
2902	♂♀	....do	.....do	....do	5.30	7.50	.....	....do.
2903	♂♀	....do	.....do	....do	5.20	7.60	.....	....do.
2904	♂	....do	.....do	....do	5.50	7.70	.....	....do.
2905	♂	....do	.....do	....do	5.20	7.40	.....	....do.
2906	♂	....do	.....do	....do	5.30	7.90	.....	....do.
2907	♂	....do	.....do	....do	5.50	7.70	.....	....do.
2908	♂	....do	.....do	....do	5.30	7.80	.....	....do.
2909	♂	....do	.....do	....do	5.50	7.90	.....	....do.
2930	....	....do	June 11, 1873	....do	.....	.....	.....	Nest, with 4 eggs.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2936	♂	Pembina, Dak	June 11, 1873	Elliott Coues.	5.10	7.60	.....	Skin.
2967	♂	....do	June 13, 1873	....do	.....	.....	.....	....do.
2979	....	....do	June 14, 1873	....do	5.00	7.50	.....	....do.
2986	....	....do	.....do	....do	5.75	.....	.....	Skin; nest with 3 eggs.
2987	....	....do	.....do	....do	.....	.....	.....	Skin; nest with 4 eggs.
2995	♂	....do	June 16, 1873	....do	5.25	7.60	.....	Skin.
3118	....	....do	June 22, 1873	....do	.....	.....	.....	Egg.
3285	....	50 miles west Pembina Mountains.	July 15, 1873	....do	5.40	8.00	.....	Skin.
3298	....	....do	July 16, 1873	....do	.....	.....	.....	....do.
3338	....	Turtle Mt., Dak	July 20, 1873	....do	.....	.....	.....	....do.
3339	....	....do	.....do	....do	.....	.....	.....	....do.
3346	....	....do	July 23, 1873	....do	.....	.....	.....	....do.
3347	....	....do	.....do	....do	.....	.....	.....	....do.
3348	....	....do	.....do	....do	.....	.....	.....	....do.
3388	....	Mouse River, Dak	July 30, 1873	....do	.....	.....	.....	....do.
3389	....	....do	.....do	....do	.....	.....	.....	....do.
3394	....	....do	Aug. 2, 1873	....do	.....	.....	.....	....do.
3416	....	Turtle Mt., Dak	Aug. 8, 1873	....do	.....	.....	.....	....do.
3490	....	Mouse River, Dak	Aug. 13, 1873	....do	4.65	8.60	.....	....do.
3598	....	....do	Aug. 30, 1873	....do	.....	.....	.....	....do.
3735	....	Long Coteau River, Dak.	Sept. 8, 1873	....do	5.25	7.50	2.30	.. do.
3804	....	Mouse River, Dak	Sept. 22, 1873	....do	5.60	7.75	2.40	....do.
3805	....	....do	.....do	....do	5.90	8.10	2.50	....do.
4339	....	West of Sweetgrass Hills.	Aug. 8, 1874	....do	.....	.....	.....	....do.
4372	....	....do	Aug. 9, 1874	....do	5.35	8.50	2.80	....do.

JUNCO HYEMALIS, (*Linn.*) *Scl.*

EASTERN SNOWBIRD.

The Snowbird appeared along the Mouse River about the middle of September in troops, as usual, and at once became abundant. I had expected to find it breeding on Pembina and Turtle Mountains, and still judge it likely that it does so, though it did not come under my observation. It may not be generally known that in the Eastern States it breeds as far south as Virginia and the Carolinas, if not still farther. While on the South Virginian Alleghanies, in the summer of 1875, at an altitude of about 5,000 feet, I scared a female off her nest, which contained four eggs. This southerly breeding-range in the mountains explains the sudden appearance of the birds upon the first cold snap in October. While in the Rocky Mountains, in August, 1874, I expected to find either this species or *J. oregonus*, but none appeared in the vicinity of our camp. The Mouse River specimens seem to be pure *hyemalis*, though the *Zonotrichia* of this same locality is *Z. intermedia*, not *Z. leucophrys*.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3767	....	Mouse River, Dak	Sept. 16, 1873	Elliott Coues.	.....	.....	.....	Skin.
3876	♂	....do	Oct. 5, 1873	....do	.....	.....	.....	....do.

ZONOTRICHIA QUERULA, (*Nutt.*) *Gamb.*

HARRIS'S FINCH.

A fine series of specimens of this handsome and interesting Finch was secured at our Mouse River Depôt during the latter half of September and beginning of October. Its breeding-grounds are as yet unknown; but these birds, at any rate, came from the north, and, as I was out every day with my gun about that time, the earliest date given below (September 18) probably indicates very nearly the time of their arrival. The previous year I had observed the birds at Fort Randall, Dakota, in October; but none remained through the winter in that locality. According to Prof. F. H. Snow, of Kansas, they winter in that State, and they have been observed by others in abundance during the migrations along the Lower Missouri, in Missouri and Iowa. I saw none at Pembina, where I suppose I arrived after they had passed on. The distribution of the species is very limited, and, as already observed, its breeding-range is not yet made out. My Mouse River specimens are, I think, the westernmost hitherto recorded. These were all in fall plumage, apparently of the first year, though a portion of the White-crowned Sparrows that came with them had perfect head-markings. They came very quietly from the north, and all at once thronged the bushes and shrubbery along the banks of the stream, in company with several other brush-loving Fringillines. At this period, they were songless, and had no note excepting a weak chirp. When disturbed at their avocations, they have a habit of flying up to the tops of the bushes to see what the fuss is about, and in this conspicuous position they may of course be readily destroyed. Their general habits appear to be much the same as those of the other *Zonotrichiæ*, though their large size, reddishness, and heavy dark markings underneath make them look somewhat like Fox Sparrows.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3770	♂	Mouse River, Dak ..	Sept. 18, 1873	Elliott Coues.	7.75	11.25	3.50	Skin.
3771	♂	....do	.....do	....do	7.50	11.10	3.40	...do.
3772	♂	....do	.....do	....do	7.25	10.85	3.40	...do.
3788	....	....do	Sept. 19, 1873	....do	7.40	11.20	3.50	...do.
3806	...	....do	Sept. 22, 1873	....do	7.30	10.70	3.40	...do.
3807	....	....do	.....do	....do	.....	10.20	3.00	...do.
3837	....	....do	Sept. 30, 1873	....do	7.50	11.25	3.40	...do.
3838	....	....do	.....do	....do	7.60	10.90	3.40	..do.
3871	♂	....do	Oct. 3, 1873	....do	7.80	11.25	3.40	...do.

ZONOTRICHIA LEUCOPHRYS INTERMEDIA, *Ridg.*

RIDGWAY'S SPARROW.

I was rather surprised to find that the White-crowned Sparrows of the Mouse River country were of this variety instead of typical *leuco-*

phrys, but such was the case, as shown beyond question by some of the specimens taken with perfect head-dress. In the Rocky Mountains, this variety was of course to be expected. In the latter region, specimens were procured in August, probably bred in the vicinity, as no migration had then begun; but in the rest of the country explored, no *Zonotrichiæ* were seen until the coming of the fall birds, when they became at once abundant in the shrubbery of the streams, about the middle of September.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3773	....	Mouse River, Dak ..	Sept. 18, 1873	Elliott Coues.	6.25	9.10	2.95	Skin.
3774	....	....do	.....do	....do	6.60	9.60	3.00	....do.
3775	....	....do	.....do	....do	6.75	10.00	3.10	....do.
3776	....	....do	.....do	....do	6.70	9.90	3.05	....do.
3777	....	....do	.....do	....do	6.75	10.00	3.05	....do.
3778	....	....do	.....do	....do	7.00	10.20	3.20	....do.
3792	....	....do	Sept. 19, 1873	....do	6.50	9.50	2.90	....do.
3793	....	....do	.....do	....do	6.30	9.10	2.80	....do.
3808	....	....do	Sept. 22, 1873	....do	6.50	9.70	3.10	....do.
3809	....	....do	.....do	....do	6.85	10.00	3.10	....do.
3810	....	....do	.....do	....do	6.65	9.65	3.00	....do.
3811	....	....do	.....do	....do	.....	.....	.....	....do.
3812	....	....do	.....do	....do	7.00	10.00	3.10	....do.
3839	....	....do	Sept. 30, 1873	....do	6.75	9.75	3.15	....do.
4533	....	Rocky Mountains, latitude 49°.	Aug. 20, 1874	....do	.....	.....	.....	....do.
4564	....	....do	Aug. 22, 1874	....do	.....	.....	.....	....do.

MELOSPIZA LINCOLNI, (*Aud.*) *Bd.*

LINCOLN'S FINCH.

Observed in large numbers during the latter part of September and beginning of October, along the Mouse River. It arrived from the north at the same time that the Snowbirds and *Zonotrichiæ* did, and during the summer was only observed in the Rocky Mountains late in August. It is a species of general distribution in North America, but it may be questioned whether it breeds anywhere in this latitude except in the Rocky Mountains. As observed along Mouse River, it was a shy and secretive bird, spending its time near the ground in the tangle along the river-bottom, and plunging into the thickest retreats upon slight alarm, with a low, rapid, jerky flight. The only note I heard was a slight chirp. Altogether its habits appear to most closely resemble those of the Swamp Sparrow, to which it is so nearly related in physical characters.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3763	....	Mouse River, Dak..	Sept. 16, 1873	Elliott Coues.	5.75	7.80	2.50	Skin.
3764	....	....do	.....do	....do	5.75	7.75	2.50	...do.
3784	....	....do	Sept. 18, 1873	....do	5.75	7.75	2.40	...do.
3789	....	....do	Sept. 19, 1873	....do	5.75	7.90	2.40	...do.
3813	....	....do	Sept. 22, 1873	....do	6.00	8.25	2.50	...do.
3814	....	....do	.....do	....do	6.10	8.20	2.50	...do.
3815	....	....do	.....do	....do	5.80	7.80	2.40	...do.
3816	....	....do	.....do	....do	5.85	8.30	2.50	...do.
3874	....	....do	Oct. 5, 1873	....do	5.50	8.10	2.50	...do.
4589	....	Rocky Mountains, latitude 49°.	Aug. 23, 1874	J. H. Batty...	.....	.....	.....	...do.

MELOSPIZA PALUSTRIS, (*Wils.*) *Bd.*

SWAMP SPARROW.

This is another of the several species of the family which were observed during the autumnal movement at the camp on Mouse River, from the middle of September until I left the country, the second week in October. It haunts the closest and most impenetrable shrubbery, to which it clings with such pertinacity that it is liable to be overlooked unless diligently sought for. I have seldom seen it in plain view, and never, to my recollection, at any distance from the ground, or on the outskirts of the undergrowth. It has been commonly considered confined to the Eastern Province, and the specimens below enumerated are, with one exception, the westernmost hitherto recorded. Dr. H. C. Yarrow, however, found it in Southern Utah some four years ago. The difficulty of tracing it westward, where it seems to be less abundant than it is in the Atlantic districts, is probably one reason why its distribution was long supposed to be more restricted than it really is.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3762	....	Mouse River.....	Sept. 16, 1873	Elliott Coues	.....	.....	.....	Skin.
3790	....	....do	Sept. 19, 1873	....do	.....	.....	.....	...do.
3791	....	....do	.....do	....do	.....	.....	.....	...do.
3830	....	....do	Sept. 27, 1873	....do	5.60	8.10	2.35	...do.
3867	....	....do	Oct. 1, 1873	....do	5.90	8.10	2.50	...do.
3873	♀	....do	Oct. 5, 1873	....do	5.50	7.70	2.25	...do.

MELOSPIZA MELODIA, (*Wils.*) *Bd.*

SONG SPARROW.

By an oversight, I stated in the "Birds of the Northwest" that I did not find this species in Northern Dakota. A specimen, however, was procured at Turtle Mountain early in August. It appears to be rare in this part of the country, as this was the only one taken, and I find no record respecting it except in my register of specimens.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3395	....	Turtle Mount'n, Dak.	Aug. 2, 1873	Elliott Coues.	.....	.....	.....	Skin.

CALAMOSPIZA BICOLOR, (*Towns.*) *Bp.*

LARK BUNTING.

The apparent absence of this species from the Red River region, with its abundance on the Missouri, is one of the strong marks of difference in the fauna of the two watersheds. It is an abundant and characteristic species of the sage-brush country of the Upper Missouri, and extends thence to the Rocky Mountains through the Milk River region. Specimens were taken soon after leaving Fort Buford, and others at various points to the headwaters of Milk River. The bird is rather a late breeder, unless the eggs found July 9 and 21 were those of a second brood, which is probable, since at no time did I hear the mating song of the males, or witness the singular aërial excursions which mark the same period of the bird's life, like those of the Yellow-breasted Chat. The earliest male specimens procured were already in worn and faded plumage. The eggs are four or five in number, measuring 0.80 to 0.95 in length by about 0.65 in breadth; they are pale bluish-green, like those of *Sialia*, and normally unmarked, though occasionally sparsely dotted. Two Cowbird eggs were found in one of the nests secured. The nest is sunken in the ground, so that the brim is flush with the surface, and is built of grasses and weed-stalks, lined with similar but finer material.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4034	....	Quaking Ash River, Mont.	June 26, 1874	Elliott Coues	.....	.....	.....	Skin.
4035	.....	....do	.....do	....do	.....	.....	.....	...do.
4183	....	Near Frenchman's River, Mont.	July 9, 1874	....do	.....	.....	.....	Nest with 2 eggs and of 2 *Molothrus*.
4186	.....	....do	.....do	....do	.....	.....	.....	Skin.
4248	♂	Two Forks of Milk River.	July 18, 1874	....do	.....	.....	.....	...do.
4250	....	Near Two Forks of Milk River.	July 21, 1874	....do	.....	.....	.....	Set of 4 eggs.
4341	♂	West of Sweetgrass Hills, Mont.	Aug. 8, 1874	....do	.....	.....	.....	Skin.
4342	♂	....do	.....do	....do	.....	.....	.....	...do.
4343	♂	....do	.....do	....do	.....	.....	.....	...do.
4344	♀	....do	.....do	....do	.....	.....	.....	...do.
4373	♂	....do	Aug. 9, 1874	....do	6.75	10.35	3.40	...do.

GONIAPHEA LUDOVICIANA, (*Linn.*) *Bowd.*

ROSE-BREASTED GROSBEAK.

I was pleased to find this truly elegant bird breeding in abundance at Pembina in the undergrowth of the heavy timber along the banks of the Red River, as I had never before enjoyed a good opportunity of studying its habits. It was not observed at any other point along the Line, though stated to penetrate as far northward as the Saskatchewan region. A fine *suite* of specimens was carefully preserved, and several sets of eggs procured. The birds were mating and in full song by the beginning of June, when I arrived upon the spot, but no nests were found until the 21st. Four was the largest number found in a nest; others contained only two or three, but in all incubation had begun. The only nest I took myself was built in a thick grove of saplings, about eight feet from the ground; it contained three eggs averaging an inch in length by three-fourths in breadth. These were of a pale dull green color, profusely speckled with reddish-brown. The nests were rather rude and bulky structures, about six inches across outside by four in depth, with the cavity only half as much each way, owing to the thickness of the loose walls. They were built entirely of the slender tortuous stems and rootlets of some climbing shrub, for the most part loosely interlaced, though more firmly, evenly, and circularly laid around the brim, and finished sometimes with a little horse-hair lining, sometimes without. The male at this season has a delightful song. The female is, however, nearly voiceless, and of extremely retiring disposition.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2794	♂	Pembina, Dak	June 2, 1873	Elliott Coues.	7.75	12.75	.....	Skin.
2795	♂	....do	.....do	... do	7.75	12.75	.....	....do.
2796	♂	....do	.....do	....do	7.75	12.75	.....	....do.
2797	♀	....do	.....do	....do	8.10	13.00	.....	....do.
2798	♀	....do	.....do	....do	8.00	12.50	.....	....do.
2841	♂	....do	June 4, 1873	....do	8.00	13.00	.....	....do.
2842	♀	....do	.....do	....do	7.75	12.75	.....	....do.
2851	♂	....do	June 5, 1873	....do	8.10	12.75	.....	... do.
2852	♂	... do	.....do	....do	7.75	12.50	.....	....do.
2928	♂	....do	June 9, 1873	....do	7.80	12.60	.....	....do.
2929	♂	....do	.....do	....do	8.00	13.00	.....	....do.
2965	♀	....do	June 13, 1873	....do	7.90	12.90	.....	....do.
3085	....	....do	June 21, 1873	....do	.....	.....	.....	Nest with 3 eggs.
3113	....	....do	June 22, 1873	....do	.....	.....	.....	Two eggs.
3129	...	....do	June 23, 1873	....do	.....	.....	.....	Nest with 4 eggs.
3170	♂	....do	June 25, 1873	....do	.....	.....	.....	Skin.

PIPILO ERYTHROPHTHALMUS, (*Linn.*) *Vieill.*

TOWHEE BUNTING.

The *Pipilo* of the Red River Valley is clearly referable to true *erythrophthalmus*, though even in this locality, decidedly Eastern in the com-

plexion of its avifauna, there is a slight tendency toward the characters of *maculatus* var. *arcticus*.

The bird was not uncommon about Pembina, where it was breeding in June. A nest was taken June 11, containing two eggs that belonged in it, together with *three* that did not, having been deposited by the Cowbirds.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2802	♂	Pembina, Dak	June 3, 1873	Elliott Coues	8.25	11.50	.....	Skin.
2803	....	....do	..... do	....do	.....	.....	.....	....do.
2931	....	....do	June 11, 1873	....do	.....	.....	.....	Nest with 2 eggs, and 3 eggs of *Molothrus*.
2976	♀	....do	June 14, 1873	....do	7.75	10.75	.....	

PIPILO MACULATUS ARCTICUS, (*Sw.*) *Coues.*

SPOTTED TOWHEE.

Along the parallel of 49°, this form becomes established at least as far east as the Mouse River, where I secured a specimen in September. Along the Missouri, *erythrophthalmus* prevails, according to Dr. Hayden, up to latitude 43°, beyond which it is replaced by the present. The Spotted Towhees were found to be abundant along the Upper Missouri, above Fort Buford, in the undergrowth of the river-bottoms; were not noticed along the tributaries of the Milk River, which are less suited to their wants, nor of course on the open prairie between the successive northern affluents. They were again met with, however, in the Rocky Mountains. It is also known to extend northward into the Saskatchewan country. Excepting its different call-note, which curiously resembles that of a Catbird, its habits and manners are the counterpart of those of the Eastern form.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3760	....	Mouse River, Dak	Sept. 16, 1873	Elliott Coues	.....	.....	.....	Skin.
4029	....	Quaking Asn River, Mont.	June 26, 1874	....do	.....	.....	.....	....do.

DOLICHONYX ORYZIVORUS, (*Linn.*) *Sw.*

BOBOLINK.

At Pembina, in June, Bobolinks were breeding in large numbers on the open prairie adjoining the river. The ground near the river has a meadowy character, which seems to exactly suit them, and they were

evidently perfectly at home. The gaily dressed males, in the pink of perfection as to their nuptial attire, and singing with the utmost volubility, were very conspicuous objects all over the prairie; but the secretive and homely females were seldom observed unless accidentally flushed from the grass. The nest is so well hidden that I did not discover one, though I searched long and carefully on more than one occasion; and I am therefore unable to state the exact period of laying. To judge from the actions of the birds and the complete separation and hiding of the females, incubation was in progress by the second week in June.

On the same parallel of latitude, I traced the species westward quite to the Rocky Mountains, where it was not uncommon in August about Chief Mountain Lake. In the Upper Missouri country, however, I failed to observe a single individual. The sterile, alkaline, and sage-brush nature of most of this region seems to be ill-suited to its wants.

The very highly plumaged specimens taken at Pembina have been made by Mr. R. Ridgway the basis of a var. *albinucha*, the buffy patch upon the back of the neck being nearly white in these cases.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2862	♂	Pembina, Dak	June 5, 1873	Elliott Coues.	7.25	12.10	.....	Skin.
2863	♂	....do	.....do	....do	7.10	11.90	.....	...do.
2885	♂	....do	.....do	....do	.....	.....	.....	...do.
2886	♀	....do	.....do	....do	.....	.....	.....	...do.
2988	♂	....do	June 14, 1873	....do	.....	.....	.....	...do.
2989	♂	....do	.....do	....do	.....	.....	.....	...do.
2990	♂	....do	.....do	....do	.....	.....	.....	...do.
3236	♂	....do	July 8, 1873	....do	.....	.....	.....	...do.
3288	♀	50 miles west of Pembina Mountains.	July 15, 1873	....do	6.90	11.00	.....	...do.
3534	....	Mouse River, Dak...	Aug. 16, 1873	....do	.....	.....	.....	...do.
4614	♂	Rocky Mountains, latitude 49°.	Aug. 26, 1874	J. H. Batty...	.....	.....	.....	...do.
4615	♂	....do	.....do	....do	.....	.....	.....	...do.

MOLOTHRUS ATER, (*Bodd.*) *Gray.*

COWBIRD.

I have nowhere found the Cowbird more abundant than it is in summer throughout the region surveyed by the Commission. Even were the birds not seen, ample evidence of their presence in numbers would be found in the alien eggs with which a majority of the smaller birds of that country are pestered. Scarcely any species, from the little Fly-catcher (*E. minimus*) and the Clay-colored Bunting up to the Towhee and Kingbird, escapes the infliction. The breeding species are there fewer than in many or most localities in the East, though abounding in individuals; both of which circumstances tend to increase the proportion of cases in which the parasitism is accomplished. It has been customary—and very properly so—to record the various species which suffer from the Cowbird; but it seems probable that when the whole truth is

known very few of those that breed within the Cowbird's summer range will be found to be passed over—among those whose eggs are not considerably larger than its own, and whose nests are accessible to the vagrant.

Although, as I have said, the Cowbirds are distributed over the whole country, yet they focus in and about the settlements; and by the same token they seem to follow the travelling parties and camp with them. The same is the case in all other parts of the West where I have observed the bird. They are like the small wolves (coyotés) in this respect. Being rarely molested, they acquire a wonderful heedlessness, and ramble unconcernedly through the camp under the feet of the horses and mules, and almost under our own. In July and August particularly, when the year's young are first on wing, gathering in small troops, they appear to have no comprehension of danger whatever, and are occasionally punished with a crack from the "black-snake" of some facetious teamster,—and, unlike a mule, they are never of any use afterward. One was actually caught by hand as it fluttered about a man's head, apparently intending to alight upon what it may have supposed to be a peculiar mule. Some time in August the birds become less numerous, apparently moving off somewhere. There seems to be something not yet clearly understood in their movements at this season. How long they actually remain in the country I am unable to say.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2840	♂	Pembina, Dak	June 4, 1873	Elliott Coues.	7.75	13.50	....	Skin.
2932	....	....do	June 11, 1873	....do	.....	.....	....	Three eggs in nest of *Pipilo.*
3046	....	....do	June 19, 1873	....do	.....	.....	....	Two eggs in nest of *Spizella pallida.*
3078	♂	....do	June 20, 1873	....do	.....	.....	....	Skin.
3079	....	....do	.....do	....do	.....	.....	....	...do.
3080	....	....do	.....do	....do	.....	.....	....	...do.
3087	....	....do	June 21, 1873	....do	.....	.....	....	Egg in nest of *Empidonax minimus.*
3106	♀	....do	June 22, 1873	....do	.....	.....	....	Skin.
3229	♂	....do	July 7, 1873	....do	.....	.....	....	...do.
3230	♂	....do	.....do	....do	.....	.....	....	...do.
3231	♂	....do	.....do	....do	.....	.....	....	...do.
3237	♂	....do	July 8, 1873	....do	.....	.....	....	...do.
3238	♂	....do	.....do	....do	.....	.....	....	...do.
3239	♂	....do	.....do	....do	.....	.....	....	...do.
3307	....	75 miles west of Pembina Mountains.	July 17, 1873	....do	.....	.....	....	...do.
3452	....	Mouse River, Dak	Aug. 9, 1873	....do	.....	.....	....	...do.
3554	....	....do	Aug. 22, 1873	....do	.....	.....	....	...do.
3555	....	....do	.....do	....do	.....	.....	....	...do.
3556	....	....do	.....do	....do	.....	.....	....	...do.
3557	....	....do	.....do	....do	.....	.....	....	...do.
4184	....	Near Frenchman's River, Mont.	July 9, 1874	....do	.....	.....	....	Two eggs from nest of *Calamospiza.*
4185 *bis*	....	....do	.....do	....do	.....	.....	....	One egg from nest of *Tyrannus carolinensis.*

AGELÆUS PHŒNICEUS, (*Linn.*) *Vieill.*

RED-WINGED BLACKBIRD.

Although inhabiting the country at large, at least as far northwest as the region of the Saskatchewan, the Marsh Blackbird is necessarily somewhat localized in the details of its distribution, owing to the requirements of its economy. It is certainly not a conspicuous feature of the region surveyed, the greater portion of which is unsuited to its wants. Even at Pembina it was not the leading Blackbird, being outnumbered both by the Yellowheads and Brewer's. I find in my notebooks no record of observation respecting it except in this locality, but this may have been my fault of neglecting to note the occurrence of so common a species at other points.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3052	♀♂	Pembina, Dak	June 19, 1873	Elliott Coues	.....	.....	.....	Skin.
3053		....do	.....do	....do	.....	.....	.....	....do.

XANTHOCEPHALUS ICTEROCEPHALUS, (*Bp.*) *Bd.*

YELLOW-HEADED BLACKBIRD.

In the breeding-season, the Yellow-headed Blackbird gathers in colonies on some marshy spot. I have observed it at this period in various portions of the West, from Northern Dakota to New Mexico, always noting its preference at this time for watery localities, however generally it may disperse over the country at other seasons. Its general distribution and migrations are given in my account of the species in the "American Naturalist" (v. 1871, p. 195) and "Birds of the Northwest" (p. 188). It is stated by Richardson to be abundant in the Fur Countries to about 58° north, reaching the Saskatchewan region by the 20th of May.

At Pembina it was breeding abundantly in the prairie sloughs, together with great numbers of Black Terns and a few Redwings. In one of the sloughs where I spent most of the day wading about, sometimes up to my waist and in some spots considerably deeper (as I was discouraged to find on getting into them), a large number of nests were found, mostly containing nestlings, but a few with eggs. This the last week of June. The nests were built much like those of the Long-billed Marsh Wren, as far as the situation goes, being fixed to a tuft of reeds or bunch of tall rank marsh-grass, some stems of which pass through the substance. They were placed at varying elevations, but always far enough above the water to be out of danger of inundation. The nest

is a light, dry, rustling structure, swaying with the motion of the reed to which it is affixed, built of the same materials as those which support it, which are woven and plaited together; no mud is used, nor is there any special lining; the brim is thick and somewhat folded over, like the seam of a garment; but I never saw a nest, among the many examined, which was arched over, as stated by some authors. The diameter outside is 5 or 6 inches, and the depth nearly as much. From three to six eggs or young birds were found in different nests; the former measure from about an inch and an eighth in length by three-fourths in breadth. The ground-color is grayish-green; this is thickly spotted with different shades of reddish-brown, sometimes so profusely that the ground-color is obscured, especially at the larger end.

Since I stated, in the "Birds of the Northwest", that I had not then seen the species on the Missouri higher up than Leavenworth, I observed it above Buford during the season of 1874.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3005	♂	Pembina, Dak	June 17, 1873	Elliott Coues.	10.00	16.25	.....	Skin.
3006	♂	....do	....do	....do	10.00	16.30	.....	....do.
3007	♀	....do	....do	....do	8.00	13.65	.....	....do.
3008	♂	....do	....do	....do	10.25	16.75	.....	....do.
3009	♂	....do	....do	....do	.....	.....	.....	....do.
3010	♂	....do	....do	....do	.....	.....	.....	... do.
3011	♂	....do	....do	....do	.....	.....	.....	....do.
3012	♂	....do	....do	....do	.....	.....	.....	....do.
3013	♂	....do	....do	....do	.....	.....	.....	....do.
3014	♂	....do	....do	....do	.....	.....	.....	....do.
3015	♂	....do	....do	....do	.....	.....	.....	....do.
3165	♀	....do	June 25, 1873	....do	.....	.....	.....	....do.
3166	♀	....do	....do	....do	8.25	13.75	4.60	....do.
3167	♀	....do	....do	....do	.....	.....	.....	....do.
3168	♂	....do	....do	....do	.....	.....	.....	....do.
3169	♂	....do	....do	....do	10.50	16.50	5.60	....do.
3182	♂	....do	June 27, 1873	....do	.....	.....	.....	....do.
3183	♂	....do	....do	....do	.....	.....	.....	....do.
3184	.....	....do	....do	....do	.....	.....	.....	Skin (nestling).
3185	.....	....do	....do	....do	.....	.....	.....	....do.
3396	.....	Turtle Mountain, Dak.	Aug. 2, 1873	....do	.....	.....	.....	Skin (young).
3491	♀	Mouse River, Dak...	Aug. 13, 1873	....do	8.70	14.10	.....	Skin.
3550	♂	....do	Aug. 22, 1873	....do	10.30	17.00	.....	....do.
3551	♂	....do	....do	....do	10.75	17.25	.....	....do.

STURNELLA MAGNA NEGLECTA, *Aud.*

WESTERN MEADOW LARK.

All the Meadow Larks observed in this region, even at Pembina, where the fauna is so thoroughly Eastern, were typical *neglecta*. They are a common bird of the whole country, though perhaps less numerous as we approach the Rocky Mountains, in the very arid Milk River region. They are fond of good soil, and seemed to me to be scarcely so abundant, even in the Red River region, as I had observed them to be in more fertile portions of Southwestern Dakota, as the vicinity of Fort Randall, for example, and thence to Sioux City. They reach this part of the country early in April. Toward the end of June, in the region above

Fort Buford, several sets of eggs were procured, and at the same time young birds were already on wing.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2853	♀	Pembina, Dak	June 5, 1873	Elliott Coues	10.65	14.50	.....	Skin.
3042	♀	....do	June 17, 1873	....do	.....	.....	.....	....do.
3103	...	....do	June 21, 1873	....do	.....	.....	.....	....do.
3213	♂	....do	June 30, 1873	....do	.....	.....	.....	....do.
3336	....	Turtle Mountain, Dak.	July 20, 1873	....do	.....	.....	.....	....do.
3402	....	....do	Aug. 2, 1873	....do	.....	.....	.....	....do.
3403	....	....do	....do	....do	.....	.....	.....	....do.
4023	....	Big Muddy River, Mont.	June 22, 1874	....do	.....	.....	.....	....do.
4028	....	Quaking Ash River, Mont.	June 26, 1874	....do	.....	.....	.....	Three eggs.
4079	....	Porcupine River, Mont.	June 28, 1874	....do	.....	.....	.....	Five eggs.

ICTERUS SPURIUS, (*Linn.*) *Bp.*

Orchard Oriole.

One specimen, early in June, at Pembina, the only locality where observed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2897	♂	Pembina, Dak	June 6, 1873	Elliott Coues.	.....	.....	.....	Skin.

ICTERUS BALTIMORE, (*Linn.*) *Daud.*

Baltimore Oriole.

Abundant at Pembina, the only locality where it was found. Like the Bobolinks of this region, the Orioles acquire an extremely brilliant plumage, in which the usual orange is often heightened into an intense flame-color. The same intensity of coloration has been noted by Mr. Allen in the cases of the Kansas Orioles. Several nests with eggs were taken during the latter part of the month of June.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen and remarks.
2793	♂	Pembina, Dak	June 2, 1873	Elliott Coues	.....	.....	.....	Skin.
2833	♂	....do	June 4, 1873	....do	7.90	12.30	.....	....do.
2834	♂	....do	.....do	....do	7.90	12.30	.....	....do.
2940	♂	....do	June 11, 1873	....do	.....	.....	.....	....do.
2941	♂	....do	.....do	....do	.....	.....	.....	....do.
2942	♂	....do	.....do	....do	.....	.....	.....	....do.
2991	♂	....do	June 14, 1873	....do	.....	.....	.....	....do.
3121	....	....do	June 22, 1873	....do	.....	.....	.....	Nest with 3 eggs.
3210	....	....do	June 23, 1873	....do	.....	.....	.....	Nest with 4 eggs.
3234	♂	....do	July 8, 1873	....do	.....	.....	.....	Skin.

SCOLECOPHAGUS CYANOCEPHALUS, (*Wagl.*) *Cab.*

BLUE-HEADED GRACKLE.

This is the characteristic Blackbird of the whole region in summer. Hundreds spend this season at Fort Pembina. It is no less abundant at Fort Buford, and in fact extends over the whole area. This is probably near its northern limit. Its general range includes the whole of the United States, from a little west of the Mississippi to the Pacific. It breeds indifferently throughout this area, but retires in winter from the northern portions of its habitat. In summer, it is the only representative of its genus in Dakota and Montana, but in the fall, after the migration, it is associated with *S. ferrugineus*. A nest containing three eggs was taken on the Quaking Ash River, Montana, June 26, 1874.

A full account of the habits of the species will be found in the "Birds of the Northwest", pp. 199–202.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2981	♂	Pembina, Dak	June 14, 1873	Elliott Coues.				Skin.
2997	♂	do	June 16, 1873	do	9.75	16.50	5.70	do.
2998	♀	do	do	do	9.00	15.00	4.75	do.
3043	♂	do	June 18, 1873	do				do.
3055	♂	do	June 19, 1873	do				do.
3077	♂	do	June 20, 1873	do				do.
3107	♂	do	June 22, 1873	do				do.
3108	♂	do	do	do				do.
3109	♀	do	do	do				do.
3134	♂	do	June 24, 1873	do				do.
3135	♂	do	do	do				do.
3765	♂	Mouse River, Dak	Sept. 16, 1873	do	9.75	15.20	4.80	do.
3766	♀	do	do	do	9.50	14.85	4.60	do.
3795	♂	do	Sept. 19, 1873	do	10.10	16.00	5.15	do.
3796	♂	do	do	do	10.15	16.25	5.15	do.
3797	♂	do	do	do	10.25	16.30	5.25	do.
3798	♀	do	do	do	9.70	15.25	4.90	do.
3799	♀	do	do	do	9.00	14.50	4.50	do.
3800	♀	do	do	do	9.50	14.80	4.75	do.
3841	♂	do	Sept. 30, 1873	do	9.30	15.00	4.70	do.
3842	♀	do	do	do	9.00	13.75	4.25	do.
3843	♀	do	do	do	9.10	13.80	4.25	do.
3844	♀	do	do	do	9.00	13.65	4.20	do.
3845	♀	do	do	do	8.90	13.70	4.25	do.
3846	♀	do	do	do	9.10	14.00	4.35	do.
3847	♂	do	do	do	9.50	14.50	4.40	do.
3848	♂	do	do	do	9.60	14.75	4.60	do.
3872	♂	do	Oct. 3, 1873	do	9.50	14.70	4.60	do.
4027	....	Quaking Ash River, Mont.	June 26, 1874	do				Nest with 3 eggs.
4627	....	Rocky Mts., lat. 49°	Aug. 28, 1874	do				Skin.

NOTE.—The above list includes some specimens (from Mouse River) of *S. ferrugineus*, not now extricable without reference to the specimens themselves, the numbers having been confused; but the summer birds are all *cyanocephalus*.

SCOLECOPHAGUS FERRUGINEUS, (*Gm.*) *Sw.*

RUSTY GRACKLE.

The Rusty Grackle enters Dakota from the north in September, and then mixes indiscriminately with the preceding species; but the two will not be found together during the breeding-season. At our camp

on the Mouse River, both species became very abundant after the second week in September, and so continued to be at the time of our departure, early in October. They associated together so intimately that a discharge into a flock of Blackbirds often brought down individuals of both species. Their habits are exactly the same, but the two species may be distinguished with little difficulty.

The foregoing tabular "List of specimens" includes, among those taken in September and October, several specimens of this species. The entry made in my register at the time did not discriminate between them, so that the numbers cannot be separated without handling the specimens, which are not conveniently accessible at time of writing.

QUISCALUS PURPUREUS ÆNEUS, *Ridg.*

Bronzed Purple Grackle.

Abundant at Pembina, where it was breeding in June in the hollows of trees. Occurred sparingly along the Mouse River in the fall, and during the last season traced westward to the Rocky Mountains. The specimens show the bronzy general coloration defined against the steel-blue head and neck, supposed to afford ground for the recognition of variety *æneus*.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent	Wing.	Nature of specimen, and remarks.
2835	♂	Pembina, Dak	June 4, 1873	Elliott Coues.	12.25	.....	.....	Skin.
2911	♀	....do	June 7, 1873	....do	.....	.....	.....	....do.
2915	♂	....do	June 9, 1873	....do	12.00	16.50	.....	....do.
2916	♂	....do	.....do	....do	.....	.....	.....	....do.
3044	♂	....do	June 18, 1873	....do	.....	.....	.....	....do.
3051	♂	....do	June 19, 1873	....do	.....	.....	.....	....do.
3054	♂	....do	.....do	....do	.....	.....	.....	....do.
3112	....	....do	June 22, 1873	....do	.....	.....	.....	Egg.
3869	♂	Mouse River, Dak	Oct. 3, 1873	....do	12.40	18.00	5.65	Skin.
4101	♂	Near mouth Milk River, Mont.	June 30, 1874	....do	.....	.....	.....	....do.
4626	....	Rocky Mountains, latitude 49°.	Aug. 28, 1874	....do	.....	.....	.....	....do.

CORVUS AMERICANUS, *Aud.*

Common Crow.

According to my observation, Crows are not very common in the region under consideration, though I saw a good many along the Mouse River. The species occurs, however, along the whole of the Missouri River. A nest containing five eggs, with the female parent, was secured on the Quaking Ash River, June 26, 1874.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4026	♀	Quaking Ash River, Mont.	June 26, 1874	Elliott Coues.	.....	.....	.....	Skin, nest, 5 eggs.

CORVUS CORAX, *Linn.*

RAVEN.

Occasionally observed, but no specimens were secured.

PICA MELANOLEUCA HUDSONICA, (*Sab.*) *Coues.*

AMERICAN MAGPIE.

No Magpies were seen in the Red River region, where, if occurring at all, I doubt their presence as far east as the river itself. During the second season, however, they were very frequently noticed at various points on the Upper Missouri and Milk Rivers, and thence to the Rocky Mountains. On the 1st of July, newly fledged birds were taken near the mouth of Milk River, and at the Sweetgrass Hills, during the first week in August, imperfectly plumaged individuals, a little over a foot long, were noticed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4123	....	Near mouth of Milk River, Mont.	July 1, 1874	Elliott Coues.	.....	.....	.....	Skin.
4124	....	....do	.....do	....do	.....	.....	.....	...do.
4316	....	Sweetgrass Hills, Mont.	Aug. 6, 1874	J. H. Batty ..	14.50	23.50	7.40	...do.
4317	....	....do	.....do	....do	.....	.....	.....	...do.
4318	....	....do	.....do	....do	.....	.....	.....	...do.
4624	....	Rocky Mountains, latitude 49°.	Aug. 28, 1874	Elliott Coues.	.....	.....	.....	...do.

CYANURUS CRISTATUS, (*Linn.*) *Sw.*

BLUE JAY.

Not seen west of Pembina, where it was very abundant.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2787	♀	Pembina, Dak	June 2, 1873	Elliott Coues.	.....	.....	.....	Skin.
2788	♂	....do	.....do	....do	.....	.....	.....	...do.
2789	....	....do	.....do	....do	.....	.....	.....	...do.

PERISOREUS CANADENSIS CAPITALIS, *Bd.*

ROCKY MOUNTAIN JAY.

Only seen in the Rocky Mountains at latitude 49°, where, however, it was common and doubtless bred. The specimens secured in this locality show the restricted dark areas of the head, upon which the variety *capitalis* is based.

There is no doubt, however, that the true *P. canadensis* occurs in suitable localities in other parts of the region surveyed, since it has been ascertained by Mr. T. M. Trippe to breed in the tamarack swamps of Minnesota.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4607	♂	Rocky Mountains, latitude 49°.	Aug. 25, 1874	Elliott Coues.	12.00	17.00	5.80	Skin.
4608	♂	....do	.....do	....do	11.85	17.00	5.90	...do.
4609	♀	....do	.....do	....do	11.80	17.00	5.85	...do.

TYRANNUS CAROLINENSIS, (*Gm.*) *Temm.*

KINGBIRD.

Extremely numerous at Pembina, where many nests were taken after the middle of June, and traced westward as far as the Survey progressed that year. One of the nests (No. 3062) was placed on a rail fence, in the crotch formed by a post. In the Missouri region, it was equally abundant from Fort Buford to near the headwaters of the Milk River. Many nests containing two to four eggs were taken the latter part of June and early in July. One of these was particularly interesting, showing that the Summer Warbler is not the only species that gets rid of the obnoxious eggs of the Cowbird by building a second story to the nest, and thus leaving the alien egg to addle in the basement below. A nest taken near Frenchman's River, containing two eggs, seemed to be a curiously built affair, and on examining it closely I found the wrong egg embedded in its substance below the others (No. 4185). The Kingbird is not so much attached to woodland as has been supposed. I saw great numbers whilst travelling by rail, on the prairies of Minnesota and Dakota, where it seemed to be as much at home as anywhere. All things considered, it may be rated as one of the most abundant and generally diffused species of the whole region under consideration.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2799	♂	Pembina, Dak	June 2, 1873	Elliott Coues	.....	.....	.....	Skin.
2831	♂	do	June 4, 1873	do	8.90	16.50	.....	do.
2832	♀	do	do	do	8.75	16.00	.....	do.
2977	....	do	June 14, 1873	do	8.00	14.00	.....	do.
3062	....	do	June 19, 1873	do	.....	.....	.....	Nest with 4 eggs.
3081	....	do	June 21, 1873	do	.....	.....	.....	Nest with 3 eggs.
3082	....	do	do	do	.....	.....	.....	do.
3083	....	do	do	do	.....	.....	.....	do.
3105	....	do	June 22, 1873	do	.....	.....	.....	Skin.
3119	....	do	do	do	.....	.....	.....	Nest with 4 eggs.
3120	....	do	do	do	.....	.....	.....	do.
3122	....	do	do	do	.....	.....	.....	Nest with 3 eggs.
3125	....	do	do	do	.....	.....	.....	Nest with 4 eggs.
3127	....	do	June 23, 1873	do	.....	.....	.....	Two eggs.
3174	....	do	June 26, 1873	do	.....	.....	.....	Nest with 2 eggs.
3211	....	do	June 28, 1873	do	.....	.....	.....	Nest with 4 eggs.
4020	....	Big Muddy River, Mont.	June 22, 1874	do	.....	.....	.....	Skin; nest with 3 eggs.
4080	....	Porcupine River, Mont.	June 28, 1874	do	.....	.....	.....	Nest with 4 eggs.
4185	....	Near Frenchman's River, Mont.	July 9, 1874	do	.....	.....	.....	Nest with 2 eggs, and 1 of *Molothrus* excluded in the basement.

TYRANNUS VERTICALIS, *Say.*

ARKANSAS FLYCATCHER.

In the Red River region, *T. carolinensis* alone represents the genus; but throughout the Upper Missouri and Milk River country the two are found together, and it is hard to say which is the most numerous. They have much the same general habits, and often associate intimately together; indeed, I have known one tree to contain nests of both species. The cries of the *verticalis* are louder and harsher, with less of a sibilant quality, than those of the Kingbird; but there is little else to note as different. The nests of the *verticalis* are bulky and conspicuous, all the more easily found because the bird has a way of leaving the general woods of the river-bottom to go up the ravines that make down from the hillsides, and there nest on some isolated tree, miles away, perhaps, from any other landmark. Taking nests of both species at the same time, I found that those of *verticalis* were generally distinguishable by their larger size and softer make, with less fibrous and more fluffy material; but the eggs, if mixed together, could not be separated with any certainty. The sets of eggs taken during the latter part of June consisted of from three to six. Eggs were found as late as the second week in July. The nests were placed in trees at a height of from five or six to forty or fifty feet, generally in the crotch of a horizontal limb, at some distance from the main trunk; but in one case a nest was placed in the crotch which the first large bough made with the trunk. In one case, a pair of the Flycatchers built in the same tree that contained the nest of Swainson's Buzzard, and both kinds of birds were incubating at peace with each other, if not with all the world, when I

came along to disturb them. In another one, they nested with a pair of Kingbirds. The birds display admirable courage in defense of their homes, loosing in their anxiety all sense of danger to themselves.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4011	...	Big Muddy River, Mont.	June 21, 1874	Elliott Coues.	.....	.....	.....	Skin; nest with 3 eggs.
4012	...	....do	.....do	....do	.....	.....	.....	Skin; nest with 5 eggs.
4017	♂	...do	June 22, 1874	....do	.....	.....	.....	Skin, with set of eggs.
4018	♀	...do	.....do	....do	.....	.....	.....	....do.
4019	♀	...do	.....do	....do	.....	.....	.....	....do.
4081	♀	Porcupine Creek, Mont.	June 28, 1874	....do	.....	.....	.....	Skin; nest with 5 eggs.
4082	♂	...do	.....do	....do	.....	.....	.....	Skin.
4083	♀	....do	.....do	....do	.....	.....	.....	....do.
4084	♀	...do	.....do	....do	.....	.....	.....	....do.
4102	♂	Near mouth of Milk River, Mont.	June 30, 1874	....do	.....	.....	.....	....do.
4103	...	....do	.....do	....do	.....	.....	.....	....do.

SAYORNIS SAYUS, (*Bp.*) *Bd.*

SAY'S FLYCATCHER.

Not observed in the Red River region. First noticed at Fort Buford, where it used to perch upon the roofs of the houses, like the Pewit of the East, and traced thence westward to the Rocky Mountains. It occurred at intervals without being particularly numerous at any point. Its nidification was not observed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4322	♀	Sweetgrass Hills, Mont.	Aug. 6, 1874	J. H. Batty...	7.50	12.10	3.90	Skin.
4371	....	....do	Aug. 9, 1874	....do	7.75	13.40	4.40	....do.
4456	....	Headwaters Milk River, Mont.	Aug. 15, 1874	Elliott Coues.	7.75	12.50	4.10	....do.
4699	♂	Near Fort Benton, Mont.	Sept. 8, 1874	....do	.....	.....	.....	....do.

CONTOPUS VIRENS, (*Linn.*) *Cab.*

WOOD PEWEE.

Only noticed at Pembina, which is probably at or near its northwestern limit.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2891	♂	Pembina, Dak	June 6, 1873	Elliott Coues.	6.25	10.25	.....	Skin.

EMPIDONAX TRAILLI, (*Aud.*) *Bd.*

TRAILL'S FLYCATCHER.

I found this species common at Pembina, like the *minimus*, during the first week in June, but did not observe it later than the 9th of that month. They appeared to pass on northward, yet I can hardly suppose that the species never breeds here, which is fully as far north as the localities in which it nests in the Eastern States. However, if it does so, I overlooked the fact.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2782	♀	Pembina, Dak	June 2, 1873	Elliott Coues.	5.50	8.75	.....	Skin.
2816	♂	....do	June 3, 1873	....do	6.00	9.10	.....	....do.
2817	♂	....do	.....do	....do	6.25	9.60	.....	....do.
2818	....	....do	.....do	....do	6.00	9.00	.....	....do.
2921	♀	....do	June 9, 1873	....do	5.50	8.40	.....	....do.

EMPIDONAX MINIMUS, *Bd.*

LEAST FLYCATCHER.

Very abundant at Pembina, and found also on Turtle Mountain, beyond which not seen. I found it common on my arrival, the 1st of June, and during that month secured a large series of specimens, including many nests and eggs, the latter not until the middle of the month. The usual site of the nest is the upright crotch formed by three or more diverging twigs of some sapling or stout bush, usually 10 or 12 feet from the ground. One nest that I took I could reach standing on the ground, but another was in a slender elm-tree some 40 feet high, on a swaying bough, but in a crotch of upright twigs as usual. The female, during incubation, is as close a setter as some of the ground Sparrows. In one instance I came within arm's length before the bird flew, and then she merely fluttered out of reach and stood uttering a disconsolate note. The nest is usually let deeply down into the crotch, and bears the impress of the twigs. It is composed of intertwined strips of fine fibrous inner bark and decomposed weedy substances, matted with a great quantity of soft plant-down, and finished with a lining of a few horsehairs or fine grasses, making a firm, warm fabric, with a smooth, even brim, about 2½ inches across outside and less than 2 inches deep; general shape tends somewhat to be conical, but much depends upon the site of the nest. The walls are thin, sometimes barely coherent along the track of the supporting twigs. The cavity is large for the size of the nest, scarcely or not contracted at the top, and about as wide as deep. In six instances I found not more than 4 eggs, which seems to be the full complement. These are pure white in color, of ordinary shape (but variable in this respect), and measure about two-thirds of an inch in length by one-half in breadth. Extremes of length noted were 0.59 and 0.68; the diameter is less variable.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen and remarks.
2780	♂	Pembina, Dak.	June 2, 1873	Elliott Coues.	5.25	8.25	.....	Skin.
2781	♂	....do	....do	....do	5.40	8.30	.....	....do.
2815	♂	....do	June 3, 1873	....do	5.50	8.25	.....	....do.
2854	♂	....do	June 5, 1873	....do	5.25	8.25	.....	....do.
2855	.....	....do	....do	....do	5.00	7.90	.....	....do.
2887	♀	....do	June 6, 1873	....do	5.00	7.70	.....	....do.
2888	♂	....do	....do	....do	5.20	8.20	.....	....do.
2922	♀	....do	June 9, 1873	....do	4.80	7.40	.....	....do.
2938	♀	....do	June 11, 1873	....do	4.90	7.80	.....	....do.
2939	♀	....do	....do	....do	4.90	7.80	.....	....do.
2956	♂	....do	June 12, 1873	....do	5.50	7.60	.....	....do.
2957	♂	....do	....do	....do	5.50	7.60	.....	....do.
2960	.....	....do	June 13, 1873	....do	.....	.....	.....	Nest with 4 eggs.
2961	.....	....do	....do	....do	.....	.....	.....	Nest with 2 eggs.
2980	♀	....do	June 14, 1873	....do	4.80	7.40	.....	Skin.
3086	.....	....do	June 21, 1873	....do	.....	.....	.....	Nest with 4 eggs, and 1 of *Molothrus.*
3123	.....	....do	June 22, 1873	....do	.....	.....	.....	Nest with 3 eggs.
3124	.....	....do	....do	....do	.....	.....	.....	Nest with 4 eggs.
3133	.....	....do	June 24, 1873	....do	.....	.....	.....	....do.
3415	.....	Turtle Mountain, Dak	Aug. 8, 1873	....do	5.40	8.40	.....	Skin.

EMPIDONAX HAMMONDI, *Bd.*

HAMMOND'S FLYCATCHER.

This species, which appears to be the Western representative of *minimus*, was only found in the Rocky Mountains, where a single specimen was secured in August.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4537	.....	Rocky Mountains, latitude 49°.	Aug. 20, 1874	Elliott Coues.	.....	.....	.....	

EMPIDONAX OBSCURUS, *Bd.*

WRIGHT'S FLYCATCHER.

Instead of *trailli* var. *pusillus*, which I expected to find in the Rocky Mountains, this species was taken in that locality. The occurrence so far beyond its hitherto-known range is particularly interesting. Three specimens were taken during the latter part of August. The bird doubtless breeds in this region, which is the northernmost point by far at which it has been observed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4520	.....	Rocky Mountains, latitude 49°.	Aug. 19, 1874	Elliott Coues.	.....	.....	.....	Skin.
4521	.....	....do	....do	....do	.....	.....	.....	....do.
4539	.....	....do	Aug. 20, 1874	....do	.....	.....	.....	....do.

ANTROSTOMUS VOCIFERUS, (*Wils.*) *Bp.*

WHIPPOORWILL.

Although I took no specimens of this bird, its unmistakable notes were heard every night in June at Pembina, assuring me of its presence in numbers in the heavy timber of the river-botton. This locality is very near its northern limit, and it probably is not found any distance west of the Red River.

CHORDILES VIRGINIANUS, (*Briss.*) *Bp.*

NIGHT-HAWK; BULL-BAT.

Occurs in summer throughout the whole region surveyed, and is in most places very common. The birds of the arid Missouri region are referable, I suppose, to var. *henryi*. Eggs were found at Pembina June 13, and at the mouth of Milk River on the 1st of July; in both instances two in number, laid on the bare ground. So late as the 23d of July, newly hatched young were found at one of our camps on Turtle Mountain. Notwithstanding that they lay in the midst of a populous camp, where the men and animals constantly passed the spot, the female continued to brood them with courage and patience, and on too near approach would feign a broken wing, and tumble about in a manner that would have seemed ridiculous could her tender object have been forgotten. The male bird made a great ado, dashing down from overhead, but apparently without any clear idea of what was expected of him, or how to do it. Upon one of my visits to the spot I found that the young had been transported since I had been there last, though only to a distance of two or three yards.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2962	♀	Pembina, Dak	June 13, 1873	Elliott Coues	9.25	23.00	.....	Skin and 2 eggs.
2982	♂	....do	June 14, 1873	....do	9.00	22.00	.....	Skin.
2996	♂	....do	June 16, 1873	....do	9.75	23.50	8.10	....do.
3299	....	50 miles west of Pembina Mts.	July 16, 1873	....do	.....	.....	.....	....do.
3300	....	....do	....do	....do	.....	.....	.....	....do.
3301	....	....do	....do	....do	.....	.....	.....	....do.
3351	....	Turtle Mt., Dak	July 23, 1873	....do	.....	.....	.....	Skin (with nestling).
3477	....	Mouse River, Dak	Aug. 10, 1873	....do	.....	.....	.....	Skin.
3719	♀	....do	Sept. 3, 1873	....do	.....	.....	.....	....do.
4117	....	Near mouth of Milk River, Mont.	July 1, 1874	....do	.....	.....	.....	Two eggs.
4264	♂	Crossing of Milk River, Mont.	July 24, 1874	....do	.....	.....	.....	Skin.
4265	♀	....do	....do	....do	.....	.....	.....	....do.
4301	♂	....do	July 25, 1874	....do	.....	.....	.....	....do.

CHÆTURA PELAGICA, (*Linn.*) *Bd.*

CHIMNEY SWIFT.

Common at Pembina, and traced thence westward only to the Mouse River. Not seen in the Missouri region nor in the Rocky Mountains. I did not notice where the birds were breeding; but from the circumstance of seeing them habitually flying about over the timber of the river-bottom, instead of at the fort, I judge that they here still retained their primitive custom of nesting in hollow trees.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen and remarks.
2800	♂	Pembina, Dak	June 2, 1873	Elliott Coues	.....	.....	.....	Skin.
3076	....	....do	June 20, 1873	....do	.....	.....	.....	...do.
3136	....	....do	June 24, 1873	....do	.....	.....	.....	...do.
3589	....	Mouse River, Dak	Aug. 27, 1873	...do	.....	.....	.....	...do.

TROCHILUS COLUBRIS, *Linn.*

RUBY-THROATED HUMMINGBIRD.

Quite common at Pembina, in the open flowery glades of the woods along the river. Not seen west of this point.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2850	♂	Pembina, Dak	June 5, 1873	Elliott Coues.	.....	.....	.....	Skin.

SELASPHORUS RUFUS, (*Gm.*) *Sw.*

RUFOUS HUMMINGBIRD.

Found in considerable numbers at our camp on Chief Mountain Lake, in open flowery spots amongst the windfalls, at an altitude of about 4,200 feet.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4522	....	Rocky Mountains, latitude 49°.	Aug. 19, 1874	Elliott Coues.	.....	.....	.....	Skin.
4523	....	....do	.....do	....do	.....	.....	.....	...do.
4535	....	....do	Aug. 20, 1874	....do	.....	.....	.....	...do.
4536	....	....do	.....do	....do	.....	.....	.....	...do.

CERYLE ALCYON, *Boie.*

BELTED KINGFISHER.

Of general distribution along the waters of this region as elsewhere in North America. I saw it on the Red, Mouse, Milk, and Missouri Rivers, and some of the affluents of the two last, as well as on the headwaters of the Saskatchewan.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2917	♀	Pembina, Dak	June 9, 1873	Elliott Coues.	.....	.....	.....	Skin.

COCCYGUS ERYTHROPHTHALMUS, (*Wils.*) *Bp.*

BLACK-BILLED CUCKOO.

Somewhat to my surprise, this Cuckoo was ascertained to breed in the Pembina Mountains. I had not previously observed it along the Red River, nor did I meet with *C. americanus* anywhere during the survey. The nest was discovered July 12, at which date it contained a single young one, scarcely able to fly, the older ones of the same brood having doubtless already made off. The nest was in what I suppose to be an unusual situation, namely, an oak scrub less than two feet from the ground, in a dense thicket on the mountain-side. A large basement of loosely interlaced twigs rested in a crotch of the bush, supporting the nest proper, which consisted of a flat matting of withered leaves and catkins of the poplar. After a chase and a headlong plunge into an uncomfortable brier-patch, I managed to catch the little fellow, who, encouraged by the constant exhortations of his anxious mother, was scrambling off in a very creditable style for one so young.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3240	....	Pembina Mountains, Dak.	July 12, 1873	Elliott Coues.	.....	.....	.....	Skin (nestling).

PICUS VILLOSUS, *Linn.*

HAIRY WOODPECKER.

Observed in heavy timber on Turtle Mountain. As a species of general dispersion in Eastern North America, it doubtless occurs in other wooded portions of the Red and Missouri region. Exactly at what point it is modified into var. *harrisi* may not have been ascertained; but the

change probably does not take place much, if any, east of the Rocky Mountains. Pure *villosus* occurs on the Missouri at Fort Randall.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3345 *bis*	....	Turtle Mountain, Dak.	July 20, 1873	Elliott Coues	.....	.....	....	Skin.

PICUS VILLOSUS HARRISI, (*Aud.*) *Coues.*

HARRIS'S WOODPECKER.

Found only in the Rocky Mountains.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4597	♂	Rocky Mountains, latitude 49°.	Aug. 24, 1874	Elliott Coues	.....	.....	.....	Skin.

SPHYRAPICUS VARIUS, (*Linn.*) *Bd.*

YELLOW-BELLIED WOODPECKER.

Plentiful at Pembina, where it was breeding with the Redheads in June, and again seen on the Mouse River; not observed further west, nor anywhere in the Missouri country,—though we are not to infer that it is actually absent from that region. In these high latitudes (and further north—for it goes to 61° at least), it is probably only a summer resident. It seems to be more decidedly migratory than most of our Woodpeckers, and penetrates in winter to Central America. This may be partly, at least, due to the peculiarity of its food, for it feeds largely upon living cambium, and may not be able to secure this to its taste when the sap ceases to flow.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2849	♀	Pembina, Dak	June 5, 1873	Elliott Coues	.....	.....	.....	Skin.
2892	♂	....do	June 6, 1873	....do	.....	.....	.....	....do.
2946	♀	....do	June 11, 1873	....do	.....	.....	.....	....do.
3171	♀	....do	June 25, 1873	....do	.....	.....	.....	....do.
3235	♂	....do	July 8, 1873	....do	.....	.....	.....	....do.
3757	....	Mouse River, Dak	Sept. 16, 1873	....do	.....	.....	.....	....do.

MELANERPES ERYTHROCEPHALUS, (*Linn.*) *Sw.*

RED-HEADED WOODPECKER.

Common along the Red and Upper Missouri Rivers. It probably extends, in suitable places, to the Rocky Mountains, but was not noticed after leaving the vicinity of the Missouri, as there is not wood enough to attract it along the affluents of the Milk River on the parallel of 49°.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2918	♀	Pembina, Dak	June 9, 1873	Elliott Coues	.....	.....	.....	Skin.
4085	....	Porcupine Creek, Mont.	June 28, 1874	....do	.....	.....	.....	....do.

ASYNDESMUS TORQUATUS, (*Wils.*) *Coues.*

LEWIS'S WOODPECKER.

While we were encamped on one of the headwaters of the Saskatchewan, at the eastern base of the mountains, a Lewis's Woodpecker flew overhead, and was distinctly recognized both by Mr. Batty and myself. At our permanent camp on Chief Mountain Lake, we confidently expected to see the species again and secure specimens, but in this we were disappointed, for not a single one was encountered in our excursions in the vicinity.

COLAPTES AURATUS, (*Linn.*) *Sw.*

GOLDEN-WINGED WOODPECKER.

Flickers were common along the Red and Mouse Rivers, and were also observed at Pembina and Turtle Mountains, which is equivalent to saying that the species inhabits the wooded portions of the Red River watershed. All the specimens secured were pure *auratus*, without a touch of *mexicanus*, and the mixed race probably does not occur in this region. This is another evidence of the distinction, which I continually insist upon, between the watersheds of the two great rivers.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2896	....	Pembina, Dak	June 6, 1873	Elliott Coues	.....	.....	.....	Skin.
2912	♂	....do	June 7, 1873	....do	.....	.....	.....	....do.
3050	♂	....do	June 19, 1873	....do	.....	.....	.....	....do.
3337	....	Turtle Mountain, Dak.	July 20, 1873	....do	.....	.....	.....	....do.
3553	....	Mouse River, Dak	Aug. 22, 1873	....do	.....	.....	.....	....do.
3720	♀	....do	Sept. 3, 1873	....do	.....	.....	.....	....do.

COLAPTES "HYBRIDUS" *of Baird.*

All the *Colaptes* of the Upper Missouri, Yellowstone, and Milk River region appear to be of the hybrid race, in which there is every degree of departure from the characters of typical *auratus*. The change begins somewhere on the Middle Missouri, as low down, *I think*, as Fort Randall, and certainly as old Fort Pierre. It is a point of interest that this mongrel style overruns into the Saskatchewan region; for, of two specimens secured at the eastern base of the mountains, one had the red quills and ash throat of *mexicanus*, and the cheek-patch mixed with red, while the other was nearly pure *auratus*.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen and remarks.
4507	♂	Rocky Mountains, latitude 49°.	Aug. 17, 1874	Elliott Coues.	.....	.....	.....	Skin: red quills and ash throat of *mexicanus*; occipital crescent and brown cap of *auratus*; cheek-patch mixed red and black.
4590	♀	....do	Aug. 23, 1874	....do	.....	.....	.....	Nearly pure *auratus*.

BUBO VIRGINIANUS, (*Gm.*) *Bp.*

GREAT HORNED OWL.

A pair of these Owls were observed at Pembina early in June, and two unfledged young ones, evidently belonging to them, were found on a fallen log in the timber-belt along the river. The nest was not discovered, though supposed to be in the hollow of a blasted tree that stood near. The old birds flew about apparently not in the least incommoded by the daylight, but were too wary to be approached; and though I set a steel trap for them, upon the log where the young had been, they did not put their foot in it. The two young birds, one of which was much larger than the other, and therefore supposed to be a female, were brought alive to camp, and kept during the whole season. They made more agreeable and amusing pets than birds of prey generally prove to be, and the fun we had out of them repaid the trouble of carrying them about. They became perfectly tame, would take food out of my hands, or even alight on my shoulder; and, after a while, when they were full-grown and in good plumage, I used to release them and allow them to forage for themselves during the night. They generally returned of their own accord, but sometimes I had to send one of my men in search of them; in fact, the care of these Owls was the chief duty of a certain member of the party during September. They began to hoot when

about four months old. One of them died soon after, from some unexplained cause; the other survived all the vicissitudes of camp-life, including a pistol-shot from a man who mistook the bird for a wild one, and was finally, after travelling seven or eight hundred miles, safely deposited in an aviary in Saint Paul.

SPEOTYTO CUNICULARIA HYPOGÆA, (*Bp.*) *Coues.*

BURROWING OWL.

First observed at a point on the Boundary Line a little east of Frenchman's River, not far from the mouth of Milk River, where a few individuals inhabited a small settlement of Prairie Dogs (*Cynomys ludovicianus*). This seems to be about the northern limit of the species, and it is nowhere so abundant in this region as in many places further south. It was met with a second time a little west of Frenchman's River, and for the third time, in somewhat greater numbers, on a piece of prairie near Sweetgrass Hills. There were no Prairie Dogs here or at the locality last mentioned, so far as I know, but the ground was riddled with the burrows of the Tawny Marmots (*Spermophilus richardsoni*), which seemed to suit the Owls just as well.

Several other species of this family certainly inhabit the region surveyed; but the two foregoing were the only ones actually observed. The circumstances of a Survey like the present are not the most favorable for observation of these nocturnal birds; for, when night comes, a man is generally too tired to care about anything but sleep, especially when the prospect is breakfast by candle-light and "pull out" at daylight to argue again with mules and miles.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4187	....	Near Frenchman's River.	July 9, 1874	Elliott Coues	.....	.....	.....	Skin.
4314	....	Sweetgrass Hills, Mont.	Aug. 3, 1874	....do	.....	.....	.....	....do.
4315	....	....do	.....do	....do	.....	.....	.....	....do.

CIRCUS CYANEUS HUDSONICUS, (*Linn.*) *Schl.*

MARSH HARRIER.

Common throughout the region surveyed, and in the vicinity of the streams and wooded parts of the country the most abundant of all the Hawks, not even excepting Swainson's Buzzard. A nest was discovered at Pembina, June 3, on the ground in the midst of the wild-rose patch that generally reaches out from the timber to the prairie. The nest was about a foot in diameter and a fourth as much in depth, with very slight

depression. It was composed of dried grasses, rather neatly disposed, resting upon a bed of rose-twigs. It contained five eggs, slightly incubated. These were of nearly equal size at both ends, and measured respectively 1.87 by 1.45, 1.86 by 1.45, 1.82 by 1.44, 1.80 by 1.45, 1.80 by 1.42. The color was dull white, with a faint greenish tinge, but without distinct markings of any kind, though much soiled mechanically. On approaching the spot where I had supposed, from observing the birds two or three times, that the nest was concealed, the female did not fly up till I was within a few feet of her, when she made off with all speed and great outcry, calling her mate. He soon appeared, and the pair circled for some time overhead, the male silent and at a very reasonable distance; the female, more impetuous or more anxious, came nearer, and constantly uttering a harsh note. At Turtle Mountain, in July, nearly a whole family, the young of which were newly on wing, was shot, the prudent male alone escaping. While encamped on Mouse River I had frequent opportunities of observing the birds fishing for frogs in the stagnant pools near the main stream.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2801		Pembina, Dak	June 3, 1873	Elliott Coues				Nest with 5 eggs.
2947	♀	do	June 11, 1873	do				Skin, with sternum.
3375	♀	Turtle Mt., Dak	July 28, 1873	do				Skin.
3376	♀	do	do	do				do.
3377	♂	do	do	do				do.
3378	♀	do	do	do				do.
3482		Mouse River, Dak	Aug. 10, 1873	do				do.
3532		do	Aug. 16, 1873	do				do.
3536	♂	do	Aug. 17, 1873	do				do.
3538		do	Aug. 19, 1873	do				do.
3737	♂	Long Coteau River, Dak.	Sept. 8, 1873	do	17.75	40.75	13.25	do.
3786	♂	Mouse River, Dak	Sept. 18, 1873	do	18.75	41.50	13.50	do.
3787	♀	do	do	do	20.50	46.50	14.60	do.
3870	♂	do	Oct. 3, 1873	do	18.50	40.50	13.35	do.
4388	♂	West of Sweetgrass Hills, Mont.	Aug. 8, 1874	do				do.
4389	♂	do	Aug. 10, 1874	do				do.
4636	♀	Rocky Mts., lat. 49°	Aug. 30, 1874	J. H. Batty				do.
4637		do	do	do				do.

ACCIPITER FUSCUS, (*Gm.*) *Gray.*

SHARP-SHINNED HAWK.

This dashing and elegant little Hawk is probably less rare in the region surveyed than my observations would indicate. I only recognized it on one occasion, when a specimen was procured, as below indicated. The second North American species of this genus, *A. cooperi*, undoubtedly occurs in this country, though it was not noticed.

While at Pembina I was assured by Colonel Wheaton, U. S. A., of the occasional occurrence in that vicinity of the Swallow-tailed Kite, *Elanoides forficatus*. This officer seemed to know the bird perfectly

well, and it is not a species about which there could easily be any mistake. Its presence here was not entirely unexpected, since it had been already found by Mr. Trippe in Minnesota at lat. 47°, and a degree or two of latitude is of course nothing to a bird of such powers of flight as this Kite possesses.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3718	♀	Mouse River, Dak..	Sept. 3, 1873	Elliott Coues	12.50	25.50	8.00	Skin.

FALCO MEXICANUS POLYAGRUS, (*Cass.*) *Coues.*

American Lanier Falcon.

At one of the astronomical stations on the west branch of the "Two Forks" of Milk River, no less than four species of large Hawks had their nests within sight of each other and only a few hundred yards apart. These were Swainson's and the Ferrugineous Buzzards, the Common Falcon, and the present species. Speaking of some of these Hawks in an article I recently contributed to the "American Naturalist" (vol. viii, 1874, 596,) I incorrectly omitted the Lanier, and all of the remarks relating to one of the nests of the supposed *F. communis* (the first one there spoken of) apply to the present species, though my account of the other nest, found a few miles away, is entirely accurate and pertinent.

I am not aware that the Lanier had before been found so far northwest as this, nor had we any reliable accounts of its nidification. In the "Birds of the Northwest" I gave a description of the eggs from a set procured by Dr. F. V. Hayden in the Wind River Mountains. The nest to which I now refer was discovered July 18, 1874, on the perpendicular face of the "cut-bank" of the stream. It contained three young, scarcely able to fly. Two of these were shot on the wing close by the nest; the third was subsequently brought to me alive by a soldier. The mother was shot, and, as well as I could determine, fell in a recess of the ground by the nest, in such a position that it could not be recovered. The male was not seen, or at any rate not recognized. This nest was built behind an upright column of earth, partly washed away from the main embankment, in such position that no full view of it could be obtained from any accessible standpoint. But it was certainly placed directly upon the ground, in a little water-worn hollow of the bank, behind the projecting mound, so that it was almost like a burrow. The spot being inaccessible from below, I had a man lowered by a rope from the top of the bank, but during the descent so much loosened earth fell into the place that the nest was completely hidden, so that its structure was left undetermined, if, indeed, there was any special structure.

This manner of nesting on the ground, in the depressions or on the projections of the cut-banks, seems to be readily adopted in this treeless region by all the Hawks, which, under other circumstances, regularly build in trees.

I should not omit to add that a colony of Cliff Swallows had affixed their nests of mud to the same embankment, a few yards from the site of the Falcon's eyrie, and appeared to be undisturbed in the possession of their homes.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4239	....	Two Forks of Milk River, Mont.	July 18, 1874	Elliott Coues.	.....	.....	.....	Skin (nestling).
4240	....	....do	....do	....do	.....	.....	.....	.....do.

FALCO COMMUNIS, *Gm.*

PEREGRINE FALCON; DUCK HAWK.

As already stated in the foregoing account of *F. polyagrus*, the Peregrine was nesting in the same place and under precisely similar conditions. Another pair had a nest about ten miles away on the same stream. Here the earth bank was perpendicular, and lying flat upon the brink I could look directly into the nest, which rested on a slight shelf about 12 feet below. It contained three young, not yet fledged, July 19. On approaching the spot, while yet several hundred yards away, I observed both parents circling high in the air, venting their displeasure at the prospective invasion in loud, harsh cries. On reaching the spot, I saw that the male thought it prudent to have business elsewhere, but the more courageous mother bird, desperate with fear and anger, made repeated dashes within a few feet of my head, till I judged it just as well to destroy her, as I had designs upon the young. She fell hurtling with a broken wing at the foot of the cliff, 30 or 40 yards below. The eyrie was totally inaccessible from below, and, as I had no rope, it was equally so from above. I tried for a long time to lasso the young ones and draw them up with a piece of cord; but they had a way of freeing themselves just before the noose drew tight, and I was obliged to leave them.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4232	♀	Two Forks of Milk River, Mont.	July 17, 1874	Elliott Coues	.....	.....	.....	Skin.

FALCO RICHARDSONI, *Ridgw.*

RICHARDSON'S MERLIN.

One specimen, the only individual of this species observed, was taken on the headwaters of the Mouse River, September 8, 1873. I had no difficulty in approaching and shooting it, as it sat on the lower limb of a small tree. The stomach contained the remains of a Sparrow.

Since the supposed similarity of the sexes of this bird proves not to hold good, one of the strongest points of distinction between it and *F. columbarius* disappears, and the probability is that it is not specifically separable from the latter.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3729	♀	Headwaters Mouse River, Dak.	Sept. 8, 1873	Elliott Coues.	12.75	26.75	8.50	Eyes dark brown; legs yellow; lores, eyelids, base of upper and most of under mandible yellowish-green; cere more yellow; rest of bill and claws blue-black.

FALCO SPARVERIUS, *Linn.*

SPARROW HAWK.

Very abundant throughout the region surveyed. The specimens taken on Turtle Mountain, August 8, 1873, had at that date nearly assumed their first complete plumage; they were all members of the same family, and had not quite given up their companionship.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3049	♂	Pembina, Dak	June 19, 1873	Elliott Coues	.....	.....	.....	Skin.
3212	♂	....do	June 28, 1873	..do	.....	.....	.....	....do.
3224	♀	...do	July 5, 1873	....do	.....	.....	.....	....do.
3418	....	Turtle Mountain, Dak	Aug. 8, 1873	....do	.....	.....	.....	....do.
3419	....	....do	.....do	....do	.....	.....	.....	.. do.
3420	....	...do	.....do	....do	.....	.....	.....	... do.
3535	♂	Mouse River, Dak	Aug. 16, 1873	....do	.....	.....	.....	... do.
3537	♀	....do	Aug. 17, 1873	....do	.....	.....	.....	....do.
3570	♂	....do	Aug. 24, 1873	....do	10.50	22.50	.....	....do.
3571	♀	....do	.....do	....do	11.50	24.50	.....	....do.
3592	♀	....do	Aug. 30, 1873	....do	10.50	23.00	7.50	....do.
3599	♂	....do	.....do	....do	11.00	23.50	7.50	....do.
4086	♀	Porcupine Creek, Mont.	June 28, 1874	....do	.....	.....	.....	....do.
4104	♂	Near mouth Milk River, Mont.	June 30, 1874	....do	.....	.....	.....	....do.
4105	♀	...do	.... do	....do	.....	.....	.....	....do.
4513	♀	Rocky Mountains, latitude 49°.	Aug. 18, 1874	....do	.....	.....	.....	....do.
4625	....	....do	Aug. 28, 1874	J. H. Batty	.....	.....	.....	....do.

BUTEO BOREALIS, (*Gm.*) *Vieill.*

RED-TAILED BUZZARD; HEN HAWK.

I frequently observed this Hawk in different portions of Iowa, Kansas, Minnesota, and Dakota; but, in most portions of the last-named Territory, it is not nearly so abundant as the next species (*B. swainsoni*). The only individual noticed during my connection with the Survey was shot on the Mouse River, where *B. swainsoni* was the prevailing form.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3755	....	Mouse River.....	Sept. 14, 1873	Elliott Coues	21. 65	49. 00	14. 50	

BUTEO SWAINSONI, *Bp.*

SWAINSON'S BUZZARD.

Very abundant in Northern Dakota and Montana, where, I may say, I saw it almost daily each season. None of the Hawk tribe, in fact, were more numerous, excepting the Harrier and Sparrow-hawk. In this part of the country, neither the Rough-legs nor the Red-tails are common, and Swainson's Buzzard chiefly represents the genus. The bird may consequently be studied satisfactorily, both with regard to its habits, and to those great changes of plumage which, before they were understood, were so perplexing, and caused several nominal species to be proposed.

Swainson's Buzzard may be found anywhere in the region indicated. When about to alight on the ground in open country, it generally takes advantage of some little knoll as an observatory whence to watch for the gophers. But it gives the preference to wooded regions, and is always most numerous in the vicinity of streams fringed with trees. The nest is usually placed in trees, sometimes in shrubbery, but when both these fail, is placed on the brink of a cut-bank, or on some shelf projecting from its face, like those of most other Hawks under the same circumstances. These ground nests are apt to be less bulky and elaborate than those constructed in trees; and there is always a wide latitude in this respect, according to the precise character of the site selected. During the first season I was too late for eggs, when I first met with the birds, but discovered several nests in the timber along the Mouse River. The only one I found with anything in it contained two half-fledged young; it was very untidy with the scurfy exfoliation from the growing feathers of the youngsters, their excrement, and remains of their food in the shape of gophers. Previous to this time, in July, an unfledged young was brought to me, and early in August I possessed a

full-grown bird of the year. There is evidently then a wide extension of the breeding-season, unless two broods are reared, which seems not unlikely.

During the season of 1874, I took plenty of eggs. Wherever there were trees, the birds preferred them. In the Milk River country, they nested on the cut-banks. I never found more than two eggs in a nest, and supposed this to be the usual number. In one case of a single egg, supposed to be of this species, incubation was advanced. All these eggs, excepting an addled one found in a deserted nest the latter part of August, were taken between June 21st and July 17th. The eggs depart from the rule in this genus, in being nearly colorless and unmarked, resembling hens' eggs quite closely, both in size and shape. Most of the specimens taken were uniform dull white, with no more evident markings than such obsolete grayish spots as frequently appear on Marsh Harriers' eggs. A few were marked with obvious dirty-brownish scratchy spots at the smaller end; none were marked all over, nor strongly blotched anywhere.

The food of these Hawks seems to consist principally of gophers (*Spermophili*), which they pounce upon when caught away from home, or lie in wait for at the mouths of the burrows, ready to "yank" them out with a quick thrust of the talons when they show their noses. But they also feed largely upon grasshoppers, with which their crops are sometimes found crammed. They cut a very ridiculous figure when skipping about over the prairie after these lively insects. A more extended notice of the habits of the species, with descriptions of its various plumages, may be found in my paper in the "American Naturalist" for May, 1874 (pp. 282–287), and in the article in the "Birds of the Northwest".

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3289	....	Fifty miles west of Pembina Mts.	July 15, 1873	Elliott Coues	.....	.....	.....	Two eggs (?).
3355	....	Turtle Mountain, Dak.	July 23, 1873	... do	.....	.....	.....	Skin.
3526	♀	Mouse River, Dak ..	Aug. 15, 1873	... do	22.00	54.00	17.00	Skin: eye brown; cere and feet yellow; bill and claws bluish-black.
3527	....	....do	.....do	....do	.....	.....	.....	Young from nest of 3526.
3528	....	....do	.....do	....do	.....	.....	.....	
3572	♀	....do	Aug. 24, 1873	....do	19.00	49.00	13.25	Skin.
3587	♀	....do	Aug. 27, 1873	....do	21.00	53.00	15.75	....do.
3590	....	....do	Aug. 29, 1873	....do	20.50	45.50	15.60	....do.
3591	....	....do	Aug. 30, 1873	....do	21.50	51.75	.....	....do.
3717	♀	....do	Sept. 3, 1873	....do	20.50	51.00	15.25	....do.
3728	♂	Long Coteau River, Dak.	Sept. 8, 1873	....do	19.25	49.00	15.25	....do.
3739	....	....do	Sept. 9, 1873	....do	20.50	50.00	15.25	....do.
3740	....	....do	.....do	....do	19.50	49.00	15.00	....do.
4013	....	Big Muddy River, Mont.	June 21, 1874	....do	.....	.....	.....	Two eggs (tree).
4036	....	Quaking Ash River, Mont.	June 26, 1874	....do	.....	.....	.....	....do.
4116	....	Near Mouth Milk River, Mont.	June 30, 1874	....do	.....	.....	.....	One egg (?) (tree).

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4230	....	Two Forks Milk River, Mont.	July 16, 1874	Elliott Coues	.....	.....	.....	Two eggs (nest on the ground).
4231	....	....do	July 17, 1874	....do	.....	.....	.....	....do.
4422	....	West of Sweetgrass Hills, Mont.	Aug. 12, 1874	J. H. Batty...	.....	.....	.....	Skin (melanistic).
4439	....	Headwaters Milk River, Mont.	Aug. 13, 1874	....do	.....	.....	.....	Skin.
4454	....	....do	Aug. 15, 1874	....do	21.50	49.75	15.25	Skin (melanistic).
4455	♀	....do	.....do	....do	21.25	52.00	16.00	Skin.
4509	....	Rocky Mountains, lat. 49°.	Aug. 17, 1874	Elliott Coues.	.....	.....	.....	....do.
4510	....	....do	.....do	....do	.....	.....	.....	....do.
4511	....	....do	.....do	....do	.....	.....	.....	One egg (addled).
4635	♂	... do	Aug. 29, 1874	....do	.....	.....	.....	Skin.

ARCHIBUTEO FERRUGINEUS, (*Licht.*) *Gray.*

FERRUGINEOUS BUZZARD.

This large and handsome Hawk was found breeding on the Pembina Mountains by one of Lieut. F. V. Greene's party, who secured two fledged young ones early in July, and brought them into camp, where they were kept as pets for some time. Their great size induced the general belief that they were "eagles"—an impression which my assertions to the contrary may have weakened in the minds of those who had some faith in me, *quâ* ornithologist, though others, more confident, seemed to have said faith somewhat disturbed. I was obliged to compromise with the remark that they might after all make pretty good eagles for a "topog. outfit", though they could not pass for such royal birds in my own camp. Later in the following season, the species was again found breeding on the Two Forks of Milk River, being one of the quartette of great Hawks which had their nests together on the cut-banks of the stream, as mentioned in a preceding paragraph. July 18, one of the parents and the two young birds, just fully fledged, were secured. I did not visit the nest, which, I was informed, was situated at the brink of one of the highest embankments. The species has already been reported, by Capt. T. Blakiston, R. A., from the region of the Saskatchewan. The present quotation, from the Pembina Mountains, is the northeasternmost to date, and considerably extends the known range of the species.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4235	....	Two Forks of Milk River, Mont.	July 18, 1874	Elliott Coues.	.....	.....	.....	Skin; parent of Nos. 4236, 4237.
4236	....	... do	....do	....do	.....	.....	.....	Skin (nestling).
4237	....	....do	....do	....do	.....	.....	.....	....do.

AQUILA CHRYSAËTUS, (*Linn.*)

GOLDEN EAGLE.

The Golden Eagle, though an inhabitant of the region at large, was only observed in one locality, at the Sweetgrass Hills, where one or more were seen very frequently. On one of the small affluents of the Milk River, a little west of the hills, two nests were found, built directly on level ground, yet at the brink of a cut-bank, which seemed to answer as the apology for the crag to which the bird usually resorts. Although the nests were empty and deserted, there can be no reasonable doubt of their belonging to the Golden Eagle—they were far too large to be those of any Hawk, and there was no trace of the presence of Bald Eagles in this dry country. One that I examined carefully was placed on the edge of a very slight embankment, not so steep that I could not easily walk up to it. It was rather on the brow of a hillock than on the brink of a cliff. It was composed of sticks, some as large as a man's wrist, brushwood, and bunches of grass and weeds, with masses of earth still adhering to the roots. The diameter was about four feet in one direction and three in the other, owing to the conformation of the ground. The mass of material averaged about six inches in depth. The other nest was described to me as considerably larger. Both were empty and apparently deserted.

HALIAËTUS LEUCOCEPHALUS, (*Linn.*) *Savig.*

BALD EAGLE.

While steaming down the Red River from Morehead to Pembina, we frequently saw Bald Eagles sailing overhead, and several nests were noticed upon the tops of tall, isolated trees as we passed along. Upon one of the nests the parent was observed sitting, but whether incubating or brooding her young could not of course be ascertained. This was the last week in May. There was a young bird in the gray plumage in confinement at Fort Pembina, and I was informed that it had been procured in the vicinity.

Three "kinds" of Eagles, aside from the Golden Eagle, which is not generally very well known in the United States, are usually recognized by the people, who can hardly be convinced that they are stages of plumage of the present species: these are the "black", "gray", and "bald" Eagle—names which respectively indicate the plumages of the first, second, and third years of the bird's life.

CATHARTES AURA, (*Linn.*) *Ill.*

TURKEY BUZZARD.

Frequently seen in the Red River region. My note-books make no mention of its occurrence during the second season, but it is not to be supposed absent, even if it was not observed. It is probably not resident in this country, and I saw none during the colder months at Fort

Randall, where it was first noticed, during the spring of 1873, about the middle of April.

ECTOPISTES MACRURA,* (*Linn.*) *Coues.*

WILD PIGEON.

Countless flocks of Wild Pigeons pervaded the atmosphere of the Red River Valley during the latter part of May and early portion of June, 1873. We observed them continually during our voyage down the river, and for some days afterward at Pembina, streaming through the air in endless succession of flocks. They generally flew high, far beyond gunshot, but in early morning and just before nightfall often came low enough to afford a shot. The woods along the river were filled with the stragglers, which of course could be easily secured. They breed here in limited numbers, but no general "pigeon-roost" was formed in the immediate vicinity. I took one nest, containing a single egg, June 13. A few of the birds straggled westward to Turtle Mountain, where one was shot in July. The next season none was seen in any part of the Missouri or Milk River region; but in the Rocky Mountains the species was again met with in small numbers, and a young bird, doubtless bred here, was secured at Chief Mountain Lake.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2836	....	Pembino, Dak	June 4, 1873	Elliott Coues	.....	.....	.....	Skin.
2913	...	....do	June 7, 1873	....do	.....	.....	.....	....do.
2964	♀	....do	June 13, 1873	....do	.....	.....	.....	....do.
2975	♂	....do	June 14, 1873	....do	17.00	23.50	8.50	....do.
.....	....	Turtle Mountain, Dak.	July —, 1873	....do	.....	.....	.....	....do.
4587	....	Rocky Mountains, latitude 49°.	Aug. 23, 1874	....do	.....	.....	.....	....do.

ZENÆDURA CAROLINENSIS, (*Linn.*) *Bp.*

CAROLINA TURTLE DOVE.

Common at Pembina in June, and again observed the following season on the Upper Missouri.

TETRAO CANADENSIS FRANKLINI, (*Dougl.*) *Coues.*

FRANKLIN'S SPRUCE GROUSE.

This variety of the Canada Grouse or Spruce Partridge is characteristic of the Northern Rocky Mountains, where it was seen, and where several

**Columba macroura* LINN. SN. ed. x, 1758, 164. (KALM, Beskrifning på de vilda Dufvor, Som somliga år i så otrolig stor mykenhet komma til de Södra Engelska nybyggen i Norra America. < Kongl. Svenska Vetensk.-Acad. Handl. xx, 1759, pp. 275–295.—See also Catesby, pl. 23; Edwards, pl. 15.)

Ectopistes macrura COUES, BNW. 1874, 766.—AUGHEY, First Ann. Rep. U. S. Entom. Comm. 1878, App. p. [46].

specimens were secured in August, 1874. It was not seen in the foot-hills, even in apparently eligible situations, nor until we were fairly in the mountains, among the timber and dense windfalls, where it was rather common in the vicinity of our camp at Chief Mountain Lake.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4529	♀	Rocky Mountains, latitude 49°.	Aug. 20, 1874	Elliott Coues.	18. 25	28. 00	8. 50	Skin.
4530	♀	....do	.....do	....do	17. 50	26. 75	8. 30	....do.

TETRAO OBSCURUS RICHARDSONI, (*Dougl.*) *Coues.*

RICHARDSON'S DUSKY GROUSE.

The remarks made under head of the last species apply equally well to the present, which was found in the same situation. It appeared to be rather the more numerous of the two. A large number of individuals were shot for sport or for food by various members of the party.

There is no doubt that a species of Ptarmigan, *Lagopus leucurus*, inhabits the higher elevations of the Rocky Mountains in this latitude.

While at Pembina, I was assured of the existence of a species of "Wood Grouse", different from the Spruce Partridge, or "Black Grouse", in the mountains of the same name. This statement, I presume, refers to *Bonasa umbellus*. No Ruffed Grouse of any variety were seen in the Rocky Mountains, but probably only through default of observation, as the *B. umbelloides* is an inhabitant of this region.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4540	♀	Rocky Mountains, latitude 49°.	Aug. 21, 1874	Elliott Coues	19. 50	28. 00	8. 50	Skin.
4541	....	....do	.....do	....do	17. 50	25. 40	8. 00	...do.
4544	....	...do	.....do	...do	.....	.....	.....	...do.

CENTROCERCUS UROPHASIANUS, (*Bp.*) *Sw.*

SAGE-COCK; COCK OF THE PLAINS.

The entire absence of this species from the Red River region is one of the characteristic points of distinction between this watershed and that of the Missouri. No Sage-cocks were seen during the first season, not even within the Missouri Coteau, in the vicinity of Fort Stevenson. Though the climatological conditions are the same as those of some regions where they abound, yet we miss the peculiar aspect of the sage-brush country to which they cling so pertinaciously. Upon leaving Fort

Buford, during the second season, we soon entered a favorable tract where the birds were tolerably common, and where several specimens were secured. At this time, the last week of June, the chicks were already flying smartly, having attained on an average the size of quails. The birds were traced to the mouth of the Milk River. Further west and north, the country seems to be too open for them, and no more were noticed.

It is a great mistake to suppose that this bird feeds entirely upon sage, as has been repeatedly asserted. A number of young birds which I opened, shot near the mouth of the Milk River, had the craw full of some kind of small aquatic beetle, which they had gleaned from a marshy spot near by, with only traces here and there of vegetable matter. Others had the crop stuffed with grasshoppers.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4071	♀	Wolf Creek, Mont..	June 27, 1874	Elliott Coues.	22.50	37.50	10.50	Skin.
4072	....	....do.....	.....do.....	....do.....	.....	.....	.....	Skin (chick).
4073	....	....do.....	.....do.....	....do.....	.....	.....	.....	....do.
4074	....	....do.....	.....do.....	....do.....	.....	.....	.....	....do.
4075	....	....do.....	.....do.....	....do.....	.....	.....	.....	....do.
4122	....	Near mouth Milk River, Mont.	July 1, 1874	....do.....	.....	.....	.....	....do.

PEDIŒCETES PHASIANELLUS COLUMBIANUS, (*Ord*) *Coues.*

SHARP-TAILED GROUSE; "PRAIRIE CHICKEN."

The whole of the region surveyed during my connection with the Commission lies beyond the range of the true Prairie-hen (*Cupidonia cupido*); while the Sage-cock, as just said, is confined to a limited portion of the Missouri country in the latitude of 49°. This leaves the field clear to the Sharp-tailed Grouse, which replaces the Prairie-hen, and abounds throughout the region from the Red River to the Rocky Mountains. In the "Birds of the Northwest", I carefully traced the general distribution of the species, particularly along the line where it inosculates with the range of the *cupido*. To this account I would refer for particulars not here given, as well as for a careful description of the various changes of plumage and other points, to give which would exceed the due bounds of the present article.

In the latitude of Pembina, the Chickens begin to lay the latter part of May or first of June. The first two weeks of the latter month are at the height of the laying and setting season. The earliest egg I procured was one cut from the parent June 4; but within a day or two a full set of eleven was found. Thirteen was the largest number secured in any one clutch; the smallest, among those in which incubation had progressed, was five. Average measurement of thirty specimens is

1.75 by 1.25; extremes of length, 1.80 and 1.60; of breadth, 1.30 and 1.20. When the shell is first formed, it is of a pale, dull greenish color; but before the egg is laid it acquires a drab or olive color by mixture of brown pigment with the original shade, and finally gains a uniform sprinkling of dark brown dots. The nests are found in various situations. Some are made out on the bare prairie, far from any landmark; others in moister tracts overgrown to willow-bushes. The first chicks I saw were caught on the 19th of June; these were newly hatched. They are very expert in hiding from the time they leave the shell. On threatened danger, the mother alarms them with a peculiar note, when they instantly scatter and squat; the mother then whirs away, but not until assured of their safety. The feathers of the wings and tail sprout first to replace the down, as in the case of the domestic fowl, in striking contrast to the growth of water-fowl, which become pretty well feathered long before their wings are serviceable for flight. The next feathers after the wings and tail are some on the poll; next appear strips of feathers on the breast and back; and with the completion of the process a plumage is assumed which lasts through part of September. In consequence of the rapid growth of the wing-feathers—a wise provision for the safety of birds until then exposed to numerous dangers—the young take short flights in a few weeks. I saw them beginning to top the bushes early in July; most of them fly quite smartly by the middle of this month, being then about as large as Quail (*Ortyx*), though some of them do not grow to this size for a month subsequently, showing a considerable range of variation in the time of hatching. I doubt that two broods are reared in a season, except perhaps in case of an accident to the first family; and for that matter, the birds seem to have all they can do to get a single set of chicks off their hands.

The plumage last mentioned is retained during the greater part of September, and is unmistakable evidence of immaturity. The birds are "fit" to shoot, in one sense, from the time they are two-thirds grown, and afford sport enough of a certain grade; but they ought to be let alone, unless one merely wishes *food*, until the moult, which occurs some time in September, is completed. They then acquire a clean, fresh, and crisp plumage, differing decidedly from that before worn, and come into prime condition. The old birds, which are in woful plight by midsummer, have by this time also accomplished the moult and come into fine feather again. The change in either case is gradual and protracted, and at no time are the birds deprived of flight, like ducks at the same trying period.

To ascertain the food of this grouse during the summer, as well as that of other species, is a matter of more than simple curiosity. The service they render in destroying grasshoppers, too often overlooked, cannot be too strenuously insisted upon, or too prominently brought to notice. I have sometimes been tempted to believe that the increasing

numbers of the scourge may be due, in part at least, to the wholesale destruction of summer grouse (both this species and the Pinnated), at the period when their services are most valuable. I have of course, in my proper official capacity, killed and opened great numbers of the birds during the whole season; and I almost invariably found their crops stuffed with grasshoppers, the only other contents being buds or flowers or the tops or succulent leaves of various plants, and small numbers of beetles, spiders, or other insects. At the height of the grasshopper season, however, the birds appear to eat scarcely anything else, and each crop will contain a large handful. If an army of grouse could be mustered and properly officered, they would doubtless prove more effectual in abating the pest than any means hitherto tried.

In the winter, according to my observations made at Fort Randall, the food of the grouse consists chiefly of cedarberries and other hard fruits that persist, and the sealed buds of various amentaceous trees.

During the latter part of September or early in October, when old and young have both finished the renewal of their plumage, and the family arrangements are foreclosed, the habits of the birds are considerably modified,—in nothing more than in the degree of shyness they exhibit. During the summer, also, they are rarely seen on trees, or on the open prairie, except in the vicinity of wooded or brushy tracts to which they may retreat. Now grown more confident, they scatter over the high prairie to feed, following up the ravines that lead from the watercourses, and in the afternoon returning to roost in the tops of the tallest trees. These daily excursions and returns may be very plainly noted along the Missouri, where the cottonwood bottoms are sharply divided from the limitless prairie. During the winter, especially when the ground is covered with snow, their arboreal habits are confirmed. The birds then hug the timber, and sometimes, on lowering or stormy days, remain motionless on their perches for hours together.

Along the Missouri, above the Yellowstone, the birds were seen in considerable numbers during the second season; but they were scarcely so common as along the Red and Mouse Rivers. Small chicks were seen the latter part of June. In the still more arid and forbidding region through which the northern affluents of the Milk River flow, there were fewer still; days sometimes passed without my seeing any. In the better country about the Sweetgrass Hills, they recurred in sufficient numbers to afford fair sport; in the eastern foothills of the Rocky Mountains, they were almost as numerous as anywhere else. They occur in the mountains up to an altitude of at least 4,200 feet, where they meet, at the bottom of the coniferous belt, the Spruce Partridge and Dusky Grouse. All three of these birds were common about our camp at Chief Mountain Lake.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2848	....	Pembina, Dak	June 4, 1873	Elliott Coues.	.....	.....	.....	Egg cut from oviduct.
2898	....	....do	June 6, 1873	....do	.....	.....	.....	Set of 11 eggs.
2899	....	....do	.....do	....do	.....	.....	.....	Set of 5 eggs.
2914	....	....do	June 7, 1873	....do	.....	.....	.....	Skin.
2934	....	....do	June 11, 1873	....do	.....	.....	.....	Set of 11 eggs.
3004	....	....do	June 16, 1873	....do	18.00	27.00	8.00	Skin.
3041	♀	....do	June 18, 1873	....do	.....	.....	.....	Skin and 12 eggs.
3047	♂	....do	June 19, 1873	....do	19.00	28.00	8.50	Skin.
3059	....	....do	.....do	....do	.....	.....	.....	Skin (chick).
3060	....	....do	.....do	....do	.....	.....	.....	...do.
3099	♀	....do	June 22, 1873	....do	.....	.....	.....	Skin.
3100	....	....do	.....do	....do	.....	.....	.....	Skin (chick).
3110	....	....do	.....do	....do	.....	.....	.....	Set of 5 eggs.
3159	....	....do	June 25, 1873	....do	.....	.....	.....	Skin (chick).
3160	....	....do	.....do	....do	.....	.....	.....	...do.
3161	....	....do	.....do	....do	.....	.....	.....	...do.
3221	....	....do	June 30, 1873	....do	.....	.....	.....	...do.
3222	....	....do	.....do	....do	.....	.....	.....	...do.
3223	....	....do	.....do	....do	.....	.....	.....	...do.
3226	....	....do	July 5, 1873	....do	.....	.....	.....	...do.
3227	....	....do	.....do	....do	.....	.....	.....	...do.
3241	....	Pembina Mts., Dak	July 13, 1873	....do	.....	.....	.....	...do.
3335	♂	Turtle Mt., Dak	July 20, 1873	....do	.....	.....	.....	Skin.
3354	....	....do	July 23, 1873	....do	.....	.....	.....	...do.
3380	....	....do	July 30, 1873	....do	.....	.....	.....	...do.
3573	....	Mouse River, Dak ..	Aug. 24, 1873	....do	17.00	28.00	.....	...do.
4014	♀	Big Muddy River, Mont.	June 22, 1874	....do	.....	.....	.....	...do.
4015	....	....do	.....do	....do	.....	.....	.....	Skin (chick).
4016	....	....do	.....do	....do	.....	.....	.....	...do.
4076	....	Wolf Creek, Mont...	June 27, 1874	....do	.....	.....	.....	...do.
4077	....	....do	.....do	....do	.....	.....	.....	...do.
4512	♂	Rocky Mountains, latitude 49°.	Aug. 18, 1874	....do	.....	.....	.....	Skin.

CHARADRIUS FULVUS VIRGINICUS, (*Bork.*) *Coues.*

AMERICAN GOLDEN PLOVER.

No Golden Plovers are seen in summer in any portion of the region explored. They pass through in large numbers during the vernal migration, in the month of May, and return again in the fall—the latter part of September. They were very abundant at this time along the Mouse River, and in fact on the prairie at large, for they scatter indiscriminately over large tracts, feeding upon the grasshoppers. Many were shot for food, to replenish a larder upon which four months' steady attention had made serious inroads. At this season, they were in excellent order, and proved very acceptable.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3328	♂	Mouse River, Dak ..	Sept. 27, 1873	Elliott Coues.	10.75	22.50	7.00	Skin; weight, 4½ oz.
3329	♀	.....do	.....do.....	....do	10.10	22.50	7.10	Skin.

ÆGIALITIS VOCIFERA, (*Linn.*) *Bp.*

KILDEER PLOVER.

Abundant thoughout the summer in all suitable places; and as it is not a fastidious bird, it seemed to be satisfied anywhere near water, though hardly upon the dry plains, like the following species. A nest with eggs was taken June 30 near the mouth of Milk River—rather, the eggs were taken from a slight depression on the pebbly margin of a stream, which answered for a nest.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2950	....	Pembina, Dak	June 11, 1873	Elliott Coues	.....	.....	.....	Skin.
4031	....	Quaking Ash River, Mont.	June 26, 1874	....do	.....	.....	.....	....do.
4107	....	Near Mouth Milk River, Mont.	June 30, 1874	....do	.....	.....	.....	Four eggs.
4387	....	West of Sweetgrass Hills, Mont.	Aug. 10, 1874	....do	.....	.....	.....	Skin.
4494	....	Rocky Mountains, latitude 49°.	Aug. 16, 1874	J. H. Batty...	.....	.....	.....	....do.

ENDROMIAS MONTANUS, (*Towns.*) *Harting.*

MOUNTAIN PLOVER.

The occurrence of this bird in the Milk River country, along the parallel of 49°, where it was breeding in considerable numbers, is a matter of interest, as fixing the northernmost points at which the species has thus far been observed. It does not appear to enter the Red River Basin, nor did I see it in the immediate vicinity of the Missouri below the mouth of Milk River. At this point, it was first seen July 1, and it was traced thence across the country nearly to the Sweetgrass Hills, beyond which it was lost. Its centre of abundance in this region was the vicinity of Frenchman's River, where many specimens, both adult and young, together with a set of three eggs, were secured during the first and second weeks in July. Three I believe to be the usual number. The birds seem to be at no time very wary or suspicious, and when they have a nest near by, or are leading their young over the prairie, they will scarcely retreat before threatened danger. Upon invasion of their breeding-places, they utter a singular, low, chattering cry, quite unlike the usual soft, mellow whistle, fly low over the ground to a short distance, or run swiftly for a few paces, and then stand motionless, drawn up to their full stature. The chicks are white beneath, curiously variegated in color above, with naked livid spaces about the neck. Almost from the first, they are difficult to capture alive; at the note of warning from the parent, they scatter with amazing celerity, and soon squat, when they become at once invisible, even in the scantiest herbage of the

prairie. The nesting period is protracted, for at the time I took nearly fresh eggs, well-feathered young, shifting for themselves, had already been observed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4120	....	Near mouth of Milk River, Mont.	July 1, 1874	Elliott Coues.	.....	.....	.....	Skin.
4131	....	Frenchman's River, Mont.	July 4, 1874	....do	.....	.....	.....	....do.
4132	♂	....do	... do	....do	.....	.....	.....	... do.
4133	....	....do	.....do	....do	.....	.....	.....	Skin (young).
4182	....	Near Frenchman's River, Mont.	July 9, 1874	....do	.....	.....	.....	Set of 3 eggs.
4188	....	....do	.....do	....do	.....	.....	.....	Skin.
4189	♀	....do	.....do	....do	.....	.....	.....	Skin (parent of Nos. 4090-2).
4190	....	....do	.....do	....do	.....	.....	.....	Skin (chick).
4191	....	....do	..... do	....do	.....	.....	.....	....do....do.
4192	....	....do	.....do	....do	.....	.....	.....	....do....do.
4210	....	....do	July 10, 1874	...do	.....	.....	.....	Skin.
4211	....	....do	.....do	....do	.....	.....	.....	... do.
4219	....	Near Two Forks of Milk River.	July 13, 1874	....do	.....	.....	.....	....do.
4220	....	....do	.....do	....do	.....	.....	.....	....do.
4229	...	Two Forks of Milk River.	July 16, 1874	....do	.....	.....	.....	....do.
4260	....	Crossing of Milk River, Mont.	July 23, 1874	....do	.....	.....	.....	....do.

RECURVIROSTRA AMERICANA, *Gm.*

AMERICAN AVOCET.

Not observed in the Red River region, but found breeding in great abundance in the Milk River country, where it seemed specially fond of the alkali pools, that are too numerous for the traveller's comfort. It is one of the most conspicuous birds of the saline region, and may be recognized at any distance by its resemblance to a Crane in miniature. Its loud voice is peculiar, and the clamor is incessant when the breeding-places are invaded. The bird nests rather early, as by the first week of July, when I first encountered it at Frenchman's River, the young were already fledged, and by the middle of the month were on wing. At this age, they show a curious enlargement of the shank, which is swollen to much greater calibre than that of the tibia. The birds being abundant, and also very unsuspicious, a fine series of specimens was readily secured. They were generally observed in flocks of half a dozen to two dozen, wading about in the shallow water, often beyond gunshot from the shore, and at such times presenting a singularly pleasing and picturesque appearance. On getting beyond their depth, they begin to swim without difficulty, and frequently alight directly on deep water. They feed by immersing the head and neck for some moments together, during which time they are feeling about with their curious bills. Their preference for the alkaline pools may be less due to the quality of the water itself than to its shallowness and stillness, and the peculiarly soft, oozy, and almost slimy condition of the bottom.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4135	♂	Frenchman's River, Mont.	July 6, 1874	Elliott Coues.	.....	.....	.....	Skin.
4136	♂	....do	.....do	....do	.....	.....	.....	....do.
4156	....	....do	July 8, 1874	....do	19.00	39.00	9.50	....do.
4391	....	West of Sweetgrass Hills, Mont.	Aug. 11, 1874	....do	.....	.....	.....	....do.
4435	....	Headquarters Milk River, Mont.	Aug. 13, 1874	J. H. Batty ..	16.50	28.00	8.25	....do.
4436	....	....do	.....do	....do	17.50	29.75	9.00	....do.
4437	....	....do	.....do	....do	17.00	27.75	8.00	....do.
4650	....	....do	Aug. 29, 1874	Elliott Coues	.....	.....	.....	....do.
4651	....	...do	.....do	....do	.....	.....	.....	....do.
4652	....	....do	.....do	....do	.....	.....	.....	....do.
4653	....	....do	.....do	....do	.....	.....	.....	....do.
4654	....	....do	.....do	....do	.....	.....	.....	....do.
4655	....	....do	.....do	....do	.....	.....	.....	....do.
4656	....	... do	.....do	....do	.....	.....	.....	....do.
4657	....	....do	.....do	....do	.....	.....	.....	....do.
4658	....	....do	..... do	....do	.....	.....	.....	....do.

STEGANOPUS WILSONI, (*Sab.*) *Coues.*

WILSON'S PHALAROPE.

Breeds throughout the country, from the Red River to the Rocky Mountains, and in suitable places common, though never observed in large numbers at any one place. I had no opportunity of observing it after August, and am inclined to think it retires southward in advance of most of the waders. Even during the latter part of August, when other waders were regularly flocking, I never saw the Phalarope in companies of more than half a dozen individuals, and it probably never makes up in large flocks, like the other two species. At Pembina, it was breeding about reedy pools and prairie sloughs in June. I was not so fortunate, however, as to discover a nest, though I searched faithfully more than once. At Mouse River, during the month of August, it was constantly seen on the pools near the stream. Newly fledged birds taken in August are altogether different from the adults in plumage and color of the naked parts. This first plumage, which strikingly resembles on the upper parts that of the *Tringa maculata*, is worn only for a brief period before it is exchanged for uniform ashy and white, which characterizes the winter state. The birds are extremely gentle and confiding during the breeding-season, and may be approached and destroyed without the slightest difficulty.

An excellent contribution to the biography of Wilson's Phalarope has recently been made by Mr. E. W. Nelson, in the Bulletin of the Nuttall Ornithological Club, vol. ii, No. 2, April, 1877, pp. 38–43.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3073	....	Pembina, Dak.	June 20, 1873	Elliott Coues	.....	.....	.....	Skin.
3455	....	Mouse River, Dak.	Aug. 10, 1873	....do	8.25	14.50	4.60	Skin: bill 1.10.
3456	....	.....do	....do	....do	.....	.....	.....	Skin.
3594	....	.....do	Aug. 30, 1873	....do	8.30	15.30	4.60	Skin: bill black; feet yellowish.
4078	....	Wolf Creek, Mont.	June 27, 1874	....do	....	.....	.....	Skin.
4152	....	Frenchman's River, Mont.	July 7, 1874	....do	.....	.....	.....	...do.
4213	♂	Near Frenchman's River, Mont.	July 12, 1874	....do	.....	.....	.....	...do.
4214	♀	....do	....do	....do	.....	.....	.....	...do.
4215	♀	....do	....do	....do	.....	.....	.....	...do.
4216	....	....do	....do	....do	.....	.....	.....	...do.
4217	....	....do	....do	....do	.....	.....	.....	...do.
4256	....	Near Two Forks of Milk River.	July 21, 1874	....do	.....	.....	.....	Skin (young).

LOBIPES HYPERBOREUS, (*Linn.*) *Cuv.*

Hyperborean Phalarope.

A large pool, or little lake, lying by the trail of our party, near the eastern base of the Rocky Mountains, a day's march east of Saint Mary's River, seemed to be a favorite resort for all the waders of the region, as well as the Ducks and Geese. There were here congregated a surprising number of water-birds—both species and individuals. Of the waders, I noticed during an hour's shooting at this spot on the 16th of August two kinds of Phalarope, the Stilt Sandpiper, the Semipalmated, Least, Baird's, and the Pectoral Sandpipers, the Willet, Greater and Lesser Yellowshanks, Solitary and Spotted Tattler, in all no less than a dozen species, of which I took specimens of nearly all. It was perhaps the only still water for many miles around, and thus attracted a full congregation of the "long-legged fraternity", to say nothing of the Ducks and Geese. The Northern Phalarope was among the number, rather unexpectedly to me, seeing how early in the season it was. There were, however, but very few of this species, in comparison with the numbers of the rest. I presume these were early arrivals from the north, since it is not probable that the species breed so far south. The evidence, however, is obviously negative; and since such boreal nesters as the Waxwing and Harlequin Duck were certainly breeding in this latitude, the Phalaropes seen here may have been hatched not far away.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4495	....	Near Rocky Mountains, latitude 49°.	Aug. 16, 1874	Elliott Coues.	.....	.....	.....	Skin.

GALLINAGO WILSONI, (*Temm.*) *Bp.*

THE SNIPE.

Snipe-shooting opened on the Mouse River the middle of September, and for two or three weeks I enjoyed as good sport of this kind as I have ever had anywhere. The birds were abundant in the usual kind of grounds, here afforded in the vicinity of the reedy pools that are strung along near the river, and some excellent bags were made. I had previously seen none of the birds, nor were any observed during the succeeding season in the Missouri and Milk River countries, where there is little to attract them.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3758	♀	Mouse River, Dak...	Sept. 16, 1873	Elliott Coues.	11. 10	19. 50	5. 25	Skin: weight, 30 oz. 5 drs.
3824	♀	....do	Sept. 27, 1873	....do	10. 00	15. 75	5. 00	Skin.
3825	♂, ♀	....do	....do	....do	11. 50	18. 50	5. 30	...do.
3826	♂, ♀	....do	....do	....do	10. 70	17. 50	5. 10	...do.
3827	♀	....do	....do	....do	11. 20	18. 20	5. 20	...do.

MACRORHAMPHUS GRISEUS, (*Gm.*) *Leach.*

RED-BREASTED SNIPE.

Observation of this species on the Mouse River during the second week in August, before the general flight of waders took place, led me to infer that it bred in this region, like several other waders not actually caught in the act. During the fall migration, in September, the birds were extremely numerous, frequenting the pools along the river in large flocks; they were unwary, apparently absorbed in their avocations, and large bags could easily be made. Out of a lot of thirty or forty killed, October 1, partly for my legitimate purposes and partly to improve our fare, I selected, carefully measured, and preserved nine individuals, the dimensions of which are subjoined in proof that the supposed *M. scolopaceus* is not a distinct species. The question is fully discussed in the "Birds of the Northwest".

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3458	....	Mouse River, Dak	Aug. 10, 1873	Elliott Coues	11. 90	19. 25	5. 75	Skin.
3459	♀	....do	.....do	....do	12. 00	20. 00	6. 00	...do.
3858	♂, ♀	....do	Oct. 1, 1873	....do	10. 25	17. 50	5. 40	...do. (bill 2.20, leg 3.40).
3859	♂	....do	.....do	....do	11. 00	18. 50	5. 65	...do. (bill 2.50, leg 3.40).
3860	♀	....do	.....do	....do	11. 25	19. 25	5. 80	...do. (bill 2.85, leg 3 85).
3861	♂	....do	.....do	....do	11. 50	19. 00	5. 75	...do. (bill 2.90, leg 4.00).
3862	♂	....do	.....do	....do	11. 75	19. 50	5. 90	...do. (bill 2.90, leg 4.10)
3863	♂	....do	.....do	....do	11. 90	19. 75	6. 00	...do. (bill 2.95, leg 4.00).
3864	♂	....do	.....do	....do	12. 25	20. 25	6. 10	...do. (bill 3.05, leg 4.10).
3865	♀	....do	.....do	....do	12. 50	19. 50	5. 85	...do. (bill 3.25, leg 4.15).

MICROPALAMA HIMANTOPUS, (*Bp.*) *Bd.*

STILT SANDPIPER.

This highly interesting species is not known to breed except in high latitudes, and has usually been regarded as rather rare in the United States. I was delighted to find it on the same lucky pool where I got the Northern Phalarope, for I had never before seen it alive. We can only surmise whether or not it had bred in the vicinity—the date was August 16; but the birds were fully flocking, and seemed to be *en route*. On repassing the pool August 29, returning from the mountains, I saw it again, and added another specimen to the half dozen secured at my first visit. In their general appearance and actions, the birds so closely resembled the Red-breasted Snipe that at gunshot range I at first mistook them for the latter, and did not recognize them until the specimens were in hand. They gathered in the same compact groups, waded about in the same sedate, preoccupied manner, fed with the same motion of the head, probing obliquely in shallow water with the head submerged, were equally oblivious of my approach, and when wounded swam with equal facility. The close structural resemblances of the two species are evidently reflected in their general economy.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4475	....	Near Rocky Mts., lat. 49°.	Aug. 16, 1874	Elliott Coues				Skin.
			.... do					....do.
4476	....	....do	.... do	....do				....do.
4477	....	....do	....do	....do	*9.00	*16.25	*5.00	....do. *Average.
4478	....	....do	....do	....do				....do.
4479	....	... do	... do	....do				....do.
4480	....	....do	....do	....do				....do.
4644	....	... do	Aug. 29, 1874	....do	...	.....	.....	.....do.

EREUNETES PUSILLUS, (*Linn.*) *Cass.*

SEMIPALMATED SANDPIPER.

This abundant and familiar little species was noticed at various points along the Line during the month of August.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3479	....	Mouse River, Dak.	Aug. 10, 1873	Elliott Coues.	.....	.....	.....	Skin.
4396	....	West of Sweetgrass Hills, Mont.	Aug. 11, 1874	.....do	.....	.....	.....	....do.
4399	....	....do	.....do	.....do	.....	.....	.....	....do.
4400	...	....do	.....do	.....do	.....	.....	.....	....do.

TRINGA MINUTILLA, *Vieill.*

LEAST SANDPIPER.

Observed a little earlier than the preceding species; and I should not be surprised if it bred in the immediate vicinity. Not noticed after the middle of August.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3383	....	Turtle Mt., Dak	July 30, 1873	Elliott Coues.	.....	.....	.....	Skin.
3384	....	....do	.....do	....do	.....	.....	.....	... do.
4370	....	West of Sweetgrass Hills, Mont.	Aug. 9, 1874	....do	5.60	10.75	3.37	....do.
4397	....	....do	Aug. 11, 1874	....do	.....	.....	.....	....do.
4398	....	....do	.....do	....do	.....	.....	.....	....do.

TRINGA BAIRDI, *Coues.*

BAIRD'S SANDPIPER.

During the fall migration, in the month of August, this is one of the most abundant Sandpipers in Dakota and Montana. I found it in small flocks along the Mouse River, and thence in suitable places to the Rocky Mountains; sometimes by itself, oftener mixing with several allied species. Its habits, during the season at least, do not appear to be peculiar in any respect. I observed it chiefly on the small saline pools of the prairie, generally near water-courses, but sometimes at a distance from any permanent stream. It is a very quiet, gentle bird, which may be approached with ease.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3543	♂	Mouse River, Dak ..	Aug. 21, 1873	Elliott Coues.	7.00	15.00	4.80	Skin. Bill, eye, and feet black.
3544	♂♀	....do	.....do	....do	7.00	15.25	.....	....do.
3545	♂♀	....do	.....do	....do	7.25	15.25	.....	....do.
3546	♂♀	....do	.....do	....do	7.50	16.75	.....	....do.
3595	....	....do	Aug. 30, 1873	....do	7.15	15.25	4.75	....do.
4385	....	West of Sweetgrass Hills, Mont.	Aug. 10, 1874	....do	.....	.....	.....	Skin.
4386	....	....do	.....do	....do	.....	.....	.....	....do.
4393	....	....do	Aug. 11, 1874	....do	.....	.....	.....	....do.
4394	....	....do	.....do	....do	.....	.....	.....	... do.
4395	....	....do	.....do	....do	.....	.....	.....	....do.
4433	....	Headwaters of Milk River, Mont.	Aug. 13, 1874	....do	7.40	15.25	4.85	....do.
4642	....	Near Rocky Mountains, latitude 49°.	Aug. 29, 1874	....do	.....	.....	.....	....do.

TRINGA MACULATA, *Vieill.*

PECTORAL SANDPIPER.

Like the last species, this one is common in both Territories during the fall migration. It was first seen the latter part of July, in company

with *T. minutilla*, on the pools about the base of Turtle Mountain. Some of the specimens secured were evidently very young birds of the year, but whether bred or not in the vicinity is uncertain.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3371	....	Turtle Mt., Dak	July 28, 1873	Elliott Coues.	.....	.....	.....	Skin.
3372	....	....do	....do	....do	.....	.....	.....	....do.
4392	....	West of Sweetgrass Hills, Mont.	Aug. 11, 1874	....do	.....	.....	.....	....do.
4492	....	Near Rocky Mountains, latitude 49°.	Aug. 16, 1874	....do	.....	.....	.....	....do.
4493	....	....do	.....do	....do	.....	.....	.....	....do.

LIMOSA FEDOA, (*Linn.*) *Ord.*

GREAT MARBLED GODWIT.

The breeding-range of this well-known bird remained until recently uncertain, and its eggs were long special desiderata of the National Museum. At Saint Paul, I saw in the collection of the Academy of Natural Sciences of that city a set which had been taken in Minnesota. The bird has been ascertained to breed also in Iowa, and I was satisfied that it did so at Pembina. The birds that I observed in this locality showed by all their actions, readily interpreted by one familiar with the subject, that they were nesting; and I did not hesitate to so assert, though I was not successful in my search for the nest. This was of date June 20, 1873. The species was not observed west of this point.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3071	♀	Pembina, Dak	June 20, 1873	Elliott Coues.	.....	.....	.....	Skin.

LIMOSA HÆMASTICA, (*Linn.*) *Coues.*

HUDSONIAN GODWIT.

While in camp at the Two Forks of Milk River, I was shown a specimen of this species, in full plumage, in the collection of my colleague, Mr. G. M. Dawson, Naturalist of the English Commission. It had been taken, I understood, some distance east of this point. I did not myself observe the species.

TOTANUS SEMIPALMATUS, (*Gm.*) *Temm.*

WILLET.

Though the specimens preserved were all taken in August alone, I occasionally observed the species at different times during both seasons,

and at various points from the Red River to the Rocky Mountains. It breeds in this region—in fact, the limit of its northward distribution is only six or seven degrees beyond—as it does in suitable places throughout the United States. I have myself observed it during the breeding-season in New Mexico and North Carolina, as well as in the present region.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3460	....	Mouse River, Dak...	Aug. 10, 1873	Elliott Coues	.....	.....	.....	Skin.
3533	....	...do	Aug. 16, 1873	....do	.....	.....	.....	....do.
4491	....	Near Rocky Mountains, latitude 49°.	Aug. 16, 1874	....do	.....	.....	.....	....do.
4508	....	....do	Aug. 17, 1874	....do	.....	.....	.....	....do.

TOTANUS MELANOLEUCUS, (*Gm.*) *Vieill.*

GREATER YELLOWSHANKS.

Not observed until the last week in July; very abundant, in August and September, throughout the region. This and the succeeding species are almost invariably found together, and frequently associating in the same flock. Their habits are exactly the same. They are generally accounted shy and wary birds in settled districts, and so I have usually found them; but in the wilds of the West they are among the most unsuspecting of the waders, and may be approached without the slightest difficulty.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3539	♀	Mouse River, Dak	Aug. 19, 1873	Elliott Coues	.....	.....	....	Skin.
3560	....	.....do	Aug. 23, 1873	...do	14.00	25.00	7.75	....do.
3561	....	.....do	.....do	....do	13.50	24.50	7.90	....do.
3580	....	.....do	Aug. 24, 1873	...do	.....	.....	.....	....do.
3581	....	.....do	.....do	...do	.....	.....	.....	....do.
3586	....	.....do	Aug. 25, 1873	....do	13.40	24.75	....	....do.
4286	....	Crossing Milk R., Mont	July 24, 1874	...do	.....	.....	.....	....do.
4438	...	Headwaters Milk R., Mont.	Aug. 13, 1874	J. H. Batty...	13.50	24.25	7.60	....do.
4489	....	Rocky Mts., lat. 49°...	Aug. 16, 1874	...do	.....	.....	.....	....do.
4646	....	.....do	Aug. 29, 1874	....do	.....	.....	.....	....do.

TOTANUS FLAVIPES, (*Gm.*) *Vieill.*

LESSER YELLOWSHANKS.

See remarks under head of the last species, equally applicable here.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3406	...	Turtle Mountain, Dak.	Aug. 5, 1873	Elliott Coues.	.....	.....	....	Skin.
3461	♀	Mouse River, Dak	Aug. 10, 1873	....do	10. 25	20. 75	....	....do.
3475	...	.....do	.....do	....do	.....	.....	....	....do.
3476	...	.....do	.....do	....do	.....	.....	....	....do.
3547	...	.....do	Aug. 22, 1873	....do	.....	.....	....	....do.
3576	...	.....do	.....do	....do	.....	.....	....	....do.
3577	...	.....do	.....do	....do	.....	.....	....	....do.
3578	...	.....do	.....do	....do	.....	.....	....	....do.
3579	...	.....do	.....do	....do	.....	.....	....	....do.
3585	♂	.....do	Aug. 25, 1873	....do	10. 40	19. 75	....	....do.
3593	...	.....do	Aug. 30, 1873	....do	10. 00	19. 50	6. 00	....do.
4287	...	Crossing Milk R., Mont	July 25, 1874	....do	.....	.....	....	....do.
4288	...	.....do	.....do	....do	.....	.....	....	....do.
4481	...	Near Rocky Mountains, lat. 49°.	Aug. 16, 1874	J. H. Batty...	.....	.....	....	....do.
4482	...	.....do	.....do	....do	.....	.....	....	....do.
4483	...	.....do	.....do	....do	.....	.....	....	....do.
4484	...	.....do	.....do	....do	.....	.....	....	....do.
4485	...	.....do	.....do	....do	.....	.....	....	....do.
4486	...	.....do	.....do	....do	.....	.....	....	....do.
4487	...	.....do	.....do	....do	.....	.....	....	....do.
4488	...	.....do	.....do	....do	.....	.....	....	....do.
4647	...	.....do	Aug. 29, 1874	....do	.....	.....	....	....do.
4 48	...	.....do	.....do	....do	.....	.....	....	....do.
4649	...	.....do	.....do	....do	.....	.....	....	....do.

TOTANUS SOLITARIUS, (*Wils.*) *Aud.*

SOLITARY TATTLER.

Occurs in abundance on all the pools and water-courses of the region during the autumnal migration. I have reason to believe that some may breed in this latitude. It is almost never seen in flocks, though numbers may be gathered about the same piece of water.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3407	...	Turtle Mountain, Dak.	Aug. 5, 1873	Elliott Coues.	.....	.....	....	Skin.
3408	...	.....do	.....do	....do	.....	.....	....	....do.
3548	...	Mouse River, Dak.....	Aug. 22, 1873	....do	.....	.....	....	....do.
3549	...	.....do	.....do	....do	.....	.....	....	....do.
3562	...	.....do	Aug. 23, 1873	....do	.....	.....	....	....do.
3563	...	.....do	.....do	....do	.....	.....	....	....do.
4289	...	Crossing Milk R., Mont	July 25, 1874	....do	.....	.....	....	....do.
4319	♂	Sweetgrass Hills, Mont	Aug. 6, 1874	J. H. Batty...	9. 00	17. 25	5. 60	....do.
4320	♀	.....do	.....do	....do	8. 40	15. 25	4. 80	....do.
4321	♂	.....do	.....do	....do	8. 40	15. 80	4. 90	....do.
4379	...	West of Sweetgrass Hills, Mont.	Aug. 10, 1874	Elliott Coues.	.....	.....	....	....do.
4380	...	.....do	.....do	....do	.....	.....	....	....do.
4381	...	.....do	.....do	....do	.....	.....	....	....do.
4446	...	Headwaters Milk R., Mont.	Aug. 14, 1874	....do	.....	.....	....	....do.
4490	...	Near Rocky Mountains, lat. 49°.	Aug. 16, 1874	....do	.....	.....	....	....do.
4644	...	.....do	Aug. 29, 1874	....do	.....	.....	....	....do.
4645	...	.....do	.....do	....do	.....	.....	....	....do.

TRINGOIDES MACULARIUS, (*Linn.*) *Gray.*

SPOTTED SANDPIPER.

The ubiquitous "teeter-tail", or "peet-weet", occurs in summer throughout the region, as it does in most other parts of North America.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2836	....	Pembina, Dak	June 4, 1873	Elliott Coues	....	....	....	Skin.
3481	....	Mouse River, Dak	Aug. 10, 1873	....do	....	....	....	....do.
4431	....	West of Sweetgrass Hills, Mont.	Aug. 12, 1874	....do	....	....	....	....do.

ACTITURUS BARTRAMIUS, (*Wils.*) *Bp.*

BARTRAMIAN TATTLER.

This interesting bird is extremely abundant over all the prairie of the Red River region. I found it upon my arrival at Pembina, June 1, and it breeds during this month. I took eggs from the second to fourth week of June, and found newly hatched birds early in July. The first week in June, a female was killed, with an egg in her ready for extrusion. During the breeding-season, they seem to scatter indiscriminately over the prairie; yet there are particular spots, generally depressed, therefore slightly more fertile, which they particularly affect. They appear to leave the country sooner than most of the waders; I saw none after the fore part of September, though the majority of the waders continued plentiful through most of this month. They make up in flocks before their departure.

In the Missouri and Milk River regions, they are not nearly so numerous—in fact, none were observed after leaving the former river; the prairie waders which breed further westward being chiefly the Long-billed Curlew.

A tolerably full and, I think, perfectly reliable biography of this species will be found in my "Birds of the Northwest".

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2847	....	Pembina, Dak	June 4, 1873	Elliott Coues	.....	.....	.....	Egg, cut from oviduct.
2874	♀	....do	June 6, 1873	....do	.....	.....	.....	Contained egg. Bill yellow, with black ridge and tip: feet dull yellow: eye dark brown.
2875	♂	....do	.....do	....do	11.50	22.25	6.40	Skin.
2943	♂♂	....do	June 11, 1873	....do	12.00	21.00	6.25	....do.
2944	♂♂	....do	.....do	....do	11.20	22.00	6.50	....do.
2945	♂	....do	.....do	....do	.....	.....	.....	....do.
2949	....	....do	.....do	....do	.....	.....	.....	Set of 4 eggs.

List of specimens—Continued.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
2999	♂	Pembina, Dak	June 16, 1873	Elliott Coues	12.75	22.00	6.75	Skin.
3000	....	....do	....do	....do	11.75	21.50	6.25	....do.
3001	♀	....do	....do	....do	12.50	22.75	6.60	....do.
3002	....	....do	....do	....do	12.25	21.50	6.60	....do.
3003	....	....do	....do	....do	13.25	22.50	7.00	....do.
3016	♀	....do	June 17, 1873	....do	.....	.....	.....	....do.
3017	♂♀	....do	....do	....do	.....	.....	.....	....do.
3018	♂♀	....do	....do	....do	.....	.....	.....	....do.
3019	♂	....do	....do	....do	.....	.....	.....	....do.
3020	....	....do	....do	....do	.....	.....	.....	....do.
3021	♂	....do	....do	....do	.....	.....	.....	....do.
3022	♂♂	....do	....do	....do	.....	.....	.....	....do.
3048	♂♂	....do	June 19, 1873	....do	.....	.....	.....	....do.
3072	....	....do	June 20, 1873	....do	.....	.....	.....	....do.
3101	....	....do	June 22, 1873	....do	.....	.....	.....	....do.
3102	....	....do	....do	....do	.....	.....	.....	....do.
3111	....	....do	....do	....do	.....	.....	.....	Set of 4 eggs.
3214	....	....do	June 28, 1873	....do	.....	.....	.....	Skin.
3215	....	....do	....do	....do	.....	.....	.....	....do.
3253	....	20 miles west of Pembina Mts.	July 14, 1873	....do	.....	.....	.....	Skin (young).
3334	....	25 miles east of Turtle Mt.	July 18, 1873	....do	.....	.....	.....	....do.
3353	....	Turtle Mt	July 23, 1873	....do	.....	.....	.....	....do.
3540	....	Mouse River, Dak	Aug. 19, 1873	....do	.....	.....	.....	Skin.
4030	....	Quaking Ash River, Mont.	June 26, 1874	....do	.....	.....	.....	....do.
4037	....	....do	....do	....do	.....	.....	.....	Four eggs.
4038	....	....do	....do	....do	.....	.....	.....	Skin. (Parent of eggs 4037.)

NUMENIUS LONGIROSTRIS, *Wils.*

LONG-BILLED CURLEW.

Breeds in moderate numbers about Pembina, the only locality where it was observed during the first season. The next year it was found in profusion over the prairie adjoining the Missouri above Buford, and the lower portions of the Milk River and its tributaries. It seemed, like the Bartramian Tattler, to affect particular localities, where colonies of twenty or thirty pairs would take up their abode for the summer, and make the air resound with their piercing and peculiarly lugubrious cries when disturbed. They were found decidedly shy and watchful; and being naturally stout, tough birds, they proved rather hard to kill. One of the most disastrous shooting exploits I ever attempted was directed against these same birds, as some of my friends who witnessed the discouraging negative results will remember. There seems to be a considerable latitude in the period of laying; I took a fresh set of eggs July 4th, having the day previous captured some young birds.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks
4100	....	Near mouth of Milk River, Mont.	June 30, 1874	Elliott Coues	.....	.....	.....	Skin.
4125	....	Frenchman's River, Mont.	July 3, 1874	....do	.....	.....	.....	Skin (young).
4130	....	....do	July 4, 1874	....do	.....	.....	.....	Set of 4 eggs.

ARDEA HERODIAS, *Linn.*

GREAT BLUE HERON.

Observed during our passage down the Red River.

NYCTIARDEA GRISEA NÆVIA, (*Bodd.*) *Allen.*

AMERICAN NIGHT HERON.

One individual seen under the same circumstances as the last.

BOTAURUS MINOR, (*Gm.*) *Boie.*

AMERICAN BITTERN.

Apparently rather common on Mouse River in September, several individuals being observed and two secured.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3703	♂	Mouse River, Dak...	Sept. 2, 1873	Elliott Coues.	28.00	45.00	11.00	Iris yellow; bill pale greenish-yellow, with black ridge and dark coral stripe; legs dull yellowish-green; claws brown.
3738	....	....do	Sept. 8, 1873	....do	23.50	38.00	9.50	

GRUS AMERICANA, (*Linn.*) *Temm.*

WHITE or WHOOPING CRANE.

White Cranes were frequently observed in the Mouse River country in August, September, and October, but always at a distance; and I was not so fortunate as to secure any specimens. There is no reason to doubt their breeding in this section. To the best of my recollection, none were seen in the Missouri or Milk River region during the second season.

GRUS CANADENSIS, (*Linn.*) *Temm.*

BROWN or SANDHILL CRANE.

Commonly observed after leaving Pembina, especially during the latter part of the season. In July, I noticed, in one of the topographical camps, the remains of a young bird, which had been caught alive. It appears to breed over the whole region, in prairie country. In the latter part of September and early in October, both this and the Whooping Crane appeared to be migrating southward, chiefly in the night-time, when their hoarse, rattling croak often broke the stillness, or sounded strong amidst the honking of the geese, the whistling of the rushing wings of the wildfowl, and the slender pipe of the waders that completed the throng of numberless migrants.

PORZANA CAROLINA, *Linn.*

SORA RAIL.

Observed during the migration in September along the Mouse River, where it appeared to be rather common. Its nesting in this region was not determined.

FULICA AMERICANA, *Gm.*

COOT.

Extremely abundant. Almost all the pools and reedy sloughs of the prairie throughout the region from the Red River to the Rocky Mountains and Upper Missouri country generally are tenanted by one or more pairs of these very common-place birds. The sets of eggs taken varied from ten to twelve in number, and there is a good deal of difference in the coloration, the ground varying from pale clay color to light creamy-brown, while the spotting consists sometimes of mere points, sometimes of sizable spots. The first set of eggs taken, June 20, contained embryos which would have been hatched in a day or two; others, taken the first and second weeks in July, were fresh; and, again, newly hatched young were found so late as July 26. Unless two broods are reared, as is not probable, there is a latitude of a full month in the time of laying. The birds were still abundant when I left the country, the second week in October.

The nests of this bird differ a good deal in location and amount of material employed. One particularly examined at Pembina consisted of a bulky mass of stout reed-stems, about 15 inches across and 8 in depth; it was lined with the softer tops of the reeds. This one was in a slough of considerable depth; it floated on the water—rather, it was placed on a matted platform of floating, broken-down reeds, and was moored to the growing plants. Other nests, in very shallow water or around the edges of pools, were stationary.

The newly hatched young are curious-looking creatures, covered with black down striped with rich golden-yellow or orange; bill vermilion-red, black-tipped; feet dark.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3064	....	Pembina, Dak.....	June 20, 1873	Elliott Coues	.....	.....	.....	Set of 11 eggs.
3364	....	Turtle Mountain, Dak.	July 26, 1873	....do	.....	.....	.....	Young, newly hatched.
3365	....	....do	....do	....do	.....	.....	.....	....do.
3868	♂	Mouse River, Dak ..	Oct. 1, 1873	....do	16.00	28.50	7.50	Skin.
4118	....	Near mouth Milk River, Mont.	July 1, 1874	....do	.....	.....	.....	Set of 12 eggs.
4176	....	Frenchman's River, Mont.	July 8, 1874	....do	.....	.....	.....	Set of 10 eggs.
4672	....	Headwaters Milk River, Mont.	Aug. 30, 1874	....do	.....	.....	.....	Skin.

Family ANATIDÆ.

Swan, Geese, and Ducks.

A few words of comment upon the general subject will place it in clearer light than that which the series of isolated remarks furnishes, and render lengthy accounts of the several species unnecessary. During the autumnal migration, vast bands of water-fowl enter Montana and Dakota from the north. The nature of the country is such that the birds stopping for rest and food necessarily come together in immense numbers; for superimposed upon their gregarious disposition is the circumstance that the water supply is precarious or isolated, the country at large wholly unsuited to their wants. The result is, that the most slender streams, often mere threads, with scarcely strength to flow, or even broken into chains of sloughs, and all the temporary water-holes formed in depressions of the prairie, become thronged with the birds. This gives an impression of extraordinary numbers of these birds, but it should be recollected that we have here the percentage of birds due to large areas concentrated in particular spots. Duck-shooting under these circumstances becomes a somewhat special branch of the art.

Another circumstance is, that the parallel of 49° is about on the edge of the breeding-ground of those species which regularly migrate northward to breed. A large number of the Ducks, and some of the Geese, as is well known, nest indiscriminately in any part of the United States; but aside from these, all of which of course occur in the present country as well as elsewhere, there are a number of species of truly boreal breeders, which begin to drop deserters at about this latitude. As a result, nearly all of the Ducks of North America, except the maritime and thoroughly Arctic ones, nest within our limits. They choose the ponds and prairie sloughs, and the little pools in the mountains; and during the latter part of the season, these places assume the appearance of a farm-yard puddle, from the quantity of droppings and cast feathers.

In general, throughout this Report, the tabular lists of specimens afford a tolerably fair index to the abundance or scarcity of the several species secured; but this fails altogether in the cases of the birds of this family, few of which seemed worth the trouble of preparing or the expense of transportation, although large numbers were shot as legitimate objects of sport or to vary our fare.

CYGNUS BUCCINATOR, *Rich.*

Trumpeter Swan.

Observed on a few occasions in Dakota late in September and during the first half of October, during the migration. It appears to pass chiefly by night, but I saw a small lot flying in the daytime near Fort Stevenson. The species is said to breed in the Yellowstone country, and also in Minnesota.

The other species of Swan, *C. americanus*, was not recognized, though it doubtless occurs during the migration.

The same remark applies to a species of Goose, *Anser albifrons gambeli*.

ANSER HYPERBOREUS, *Pall.*

SNOW GOOSE; WHITE BRANT.

Abundant during the migrations. On a former occasion, I noted their spring migration in Southern Dakota, at Fort Randall, from the latter part of March through most of April. In the fall, I saw none until October.

BRANTA CANADENSIS, (*Linn.*) *Gray.*

CANADA GOOSE.

Whilst steaming up the Missouri in June, 1874, I saw several broods of goslings swimming near the banks. At a pool in Montana, west of Frenchman's River, a colony had established themselves to breed; and during the time when neither old nor young could fly, several dozen were killed with clubs by some people attached to one of the surveys. The frequent nesting of the species in *trees*, in various parts of the Northwest, is perfectly well attested, though the fact did not come under my own observation. Birds apparently from the north were common along the Mouse River in the latter part of September; a few had made their appearance the last of August, and their numbers were augmented during the month.

BRANTA BERNICLA, (*Linn.*) *Scop.*

BRANT; BLACK BRANT.

Observed only during the migration.

ANAS BOSCHAS, (*Linn.*)

MALLARD.

Breeds abundantly throughout the region in suitable places. Flappers about a week old were seen at Pembina June 20.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3065	♀	Pembina, Dak	June 20, 1873	Elliott Coues				Skin; parent of Nos. 3066–7.
3066		do	do	do				Ducklings.
3067		do	do	do				do.

DAFILA ACUTA, (*Linn.*) *Jenyns.*

SPRIGTAIL.

This beautiful Duck, equally attractive on and off the table, is abundant throughout the region, not only during the fall migration, but in the summer. By the middle of August, the young birds are full-grown, in fine feather, and in the best possible condition for the table. Many pairs were found breeding in pools in the Milk River region, especially in the vicinity of Frenchman's, early in July. At this period, the young and old were equally unable to fly, as the former had not got their feathers and the latter had lost theirs. When disturbed in the pools at such time, they had the habit of creeping slyly out on the prairie, and squatting so low, like Grouse, that they were often lost, even when the herbage was quite scanty. Many were captured by hand or killed with sticks.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3068	♀	Pembina, Dak	June 20, 1873	Elliott Coues	.....	.....	.....	Skin.
3069	♀	do	do	do	.....	.....	.....	do.

CHAULELASMUS STREPERUS, (*Linn.*) *Gray.*

GADWALL.

Abundant throughout the region, where it breeds, like nearly all the other *Anatinæ*. Young still unfledged were observed late in August.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3405	....	Turtle Mt., Dak	Aug. 5, 1873	Elliott Coues	.....	.....	.....	Skin.

MARECA AMERICANA, (*Gm.*) *Steph.*

WIDGEON.

Abundant throughout; breeding. Young still unable to fly were seen until the middle of September.

QUERQUEDULA CAROLINENSIS, (*Gm.*) *Steph.*

GREEN-WINGED TEAL.

Extremely abundant throughout. It enters the country by thousands, in August, among the earliest arrivals of water-fowl from the north. I have little doubt that some breed in Northern Dakota; but as the only

"teals'" eggs I took were not identified satisfactorily, and as I saw no birds not in perfect feather, I cannot state positively that it does so. This was a favorite bird with me for shooting for the table, where I always thought it looked better than it did in my collecting-chest. "Two and a half teal, broiled, on toast," became my well-known limit for supper; but I never succeeded in "preserving" the third bird without mutilation.

QUERQUEDULA DISCORS, (*Linn.*) *Steph.*

BLUE-WINGED TEAL.

Arrives early, in the fore part of August, like the Green-wing, and becomes very abundant. It also doubtless breeds.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3558	....	Mouse River, Dak ..	Aug. 22, 1873	Elliott Coues.	.....	.....	.....	Skin.

SPATULA CLYPEATA, (*Linn.*) *Boie.*

SHOVELLER.

Abundant throughout. Found breeding on Mouse River, where young about half-grown were taken August 10.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3480	....	Mouse River, Dak ..	Aug. 10, 1873	Elliott Coues.	.....	.....	.....	Skin (young).

FULIGULA AFFINIS, *Eyton.*

LESSER SCAUP DUCK.

The Scaups which I found breeding numerously in the Upper Missouri and Milk River region appeared to be chiefly, if not wholly, of this species, as several species examined certainly were. At some points, they were extremely abundant, outnumbering the other Ducks.

The *F. marila* undoubtedly occurs, during the migration at least, if not also in the breeding-season.

FULIGULA COLLARIS, (*Donovan*) *Bp.*

RING-NECKED DUCK.

Specimen seen in Mr. Dawson's collection.

FULIGULA VALLISNERIA, (*Wils.*) *Steph.*

CANVAS-BACK DUCK.

The breeding resorts of this celebrated and much over-rated bird were for a long time considered uncertain, and its eggs have not long been known. They were discovered, I think, by the late Mr. R. Kennicott in the northwest part of British America. Mr. W. H. Dall speaks of the Canvas-back as breeding abundantly on the Yukon, and Dr. J. S. Newberry found it "more numerous than any other Ducks" in the Cascade Mountains in summer. At Turtle Mountain, in July, I saw several broods of partly grown young; a number were secured, with a parent bird, so that there is no doubt of the correctness of the identification. In most of the region, however, the bird is less numerous than the Redhead.

FULIGULA FERINA AMERICANA, (*Eyt.*) *Coues.*

RED HEAD DUCK.

Abundant throughout, but whether breeding or not was left undetermined. None were seen or at least recognized excepting in the migrating season.

BUCEPHALA ISLANDICA, (*Gm.*) *Bd.*

ROCKY MOUNTAIN GOLDEN-EYE.

I was greatly interested to find this species breeding in the Rocky Mountains. A brood of young, accompanied by the female, was seen on one of the little side-pools, surrounded by timber, at our camp on Chief Mountain Lake; the old bird and two of the young, out of five or six, were secured by one of the officers of the military escort, who made over the flappers to me, but seemed so disinclined to part with the old one that I did not press the matter, although I greatly desired the specimen. This is, I believe, the first recorded instance of the occurrence of the species during the breeding-season in the United States.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4542	....	Rocky Mountains, latitude 49°.	Aug. 21, 1874	Elliott Coues.	.....	.....	.....	Skin (very young).
4543	....	....do	.....do	....do	.....	.....	.....	.....do.

BUCEPHALA CLANGULA, (*Linn.*) *Coues.*

GOLDEN-EYE.

Supposed, on good grounds, to occur during the migrations, though not observed, at any rate not recognized, by myself.

BUCEPHALA ALBEOLA, (*Linn.*) *Baird.*

BUFFLE-HEAD.

This Duck is among the commonest species after the fall migration; and I have reason to believe that it nests, in limited numbers, in Northern Dakota, as it certainly does in the Milk River country. At Turtle Mountain I found young birds in July, but they were able to fly, and may not have been hatched on the spot.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3410	...	Turtle Mount'n, Dak.	Aug. 7, 1873	Elliott Coues.	.....	.....	.....	Skin.

HISTRIONICUS TORQUATUS, (*Linn.*) *Bp.*

HARLEQUIN DUCK.

It was my good fortune to determine the breeding of this Duck in the Rocky Mountains of the United States. There is in the National Collection an egg cut from a bird taken by Dr. Hayden somewhere in the mountains May 31, warranting inference of the fact here established. Broods of flappers were discovered on a clear brawling stream near the camp on Chief Mountain Lake, and several of them, including the mother of one of the broods, were secured. The nest was not found. It was probably in the hollow of a tree near the spot. The birds showed great powers of swimming and diving in the turbulent stream, where they seemed as much at home as the family of Dippers (*Cinclus*) that was seen with them. When disturbed, the old bird flew away low over the water, while others sank back quietly till only the head remained in view, much like Grebes. Some sought refuge behind and beneath a little cascade, screened by the whole volume of water that leaped over a projecting rock. One of the broods was seen swimming quietly in a pool near the lake.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4528	....	Rocky Mts., lat. 49°.	Aug. 20, 1874	Elliott Coues.	.....	.....	.....	Skin.
4553	....	....do	Aug. 22, 1874	....do	.....	.....	.....	....do.
4554	....	....do	.....do	... do	.....	.....	.....	....do.
4555	♀	....do	.....do	....do	.....	.....	.....	....do.

ERISMATURA RUBIDA, (*Wils.*) *Bp.*

RUDDY DUCK.

Common, and breeding in suitable localities throughout the region. At Turtle Mountain, it was nesting in numbers in the pools, where the young were observed, still unable to fly, the latter part of July and early in August. Several specimens of various ages were secured.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3368	....	Turtle Mt., Dak	July 28, 1873	Elliott Coues.	.....	.....	.....	Skin (young).
3369	....	....do	.....	....do	.....	.....	.....	
3381	....	....do	July 30, 1873	....do	.....	.....	.....	Skin.
3411	....	....do	Aug. 7, 1873	....do	.....	.....	.....	Skin (young).

MERGUS CUCULLATUS, *Linn.*

HOODED MERGANSER.

This is the only species of the genus actually observed by the Commission, though the other two doubtless also occur, at least during the migrations. It breeds in this region.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3409	♀	Turtle Mt., Dak	Aug. 5, 1873	Elliott Coues.	18.00	26.00	7.50	Skin.
3412	♂	....do	Aug. 7, 1873	....do	.....	.....	.....	....do.
3866	♀	Mouse River.....	Oct. 1, 1873	....do	18.25	26.00	7.25	....do.

PELECANUS TRACHYRHYNCHUS, *Lath.*

WHITE PELICAN.

An old female, in sickly condition, was shot from the steamer as we neared Pembina, and I heard of one or two other specimens shot on the Red River about this point in May. The species was only once again observed, namely, at La Rivière de Lac, near Mouse River, early in September. A few individuals were seen, but the locality did not appear to be a breeding-place, nor did I find any such elsewhere.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
*2773	♀	Red River, near 49°	May 31, 1873	Elliott Coues	.....	.....	.....	Skeleton.

* Stomach contained about fifty crawfish (*Cambarus couesi* Streets); pouch diseased, from attacks of parasites.

GRACULUS DILOPHUS, *Sw.*

DOUBLE-CRESTED CORMORANT.

Once observed on the Red River, near Pembina, late in May.

LARUS ARGENTATUS SMITHSONIANUS, *Coues.*

AMERICAN HERRING GULL.

A specimen was shot by Mr. J. H. Batty near Fort Benton, Mont. Some of the large Gulls observed in September during our boat voyage down the Missouri may have been of this species, but all that were fully identified were *L. delawarensis.*

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
4700	....	Near Fort Benton, Mont.	Sept. 8, 1874	J. H. Batty...	.....	.....	.....	Skin (young).

LARUS DELAWARENSIS, *Ord.*

RING-BILLED GULL.

A considerable flock of this species was seen hovering over Rivière de Lac about the middle of September, and two specimens were secured. It was not again identified to my satisfaction until the following season, when it was seen in considerable numbers on a large pool close by Chief Mountain.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3745	....	Near Mouse R., Dak	Sept. 12, 1873	Elliott Coues	.....	.....	.....	Skin.
3746	....	....do	.... do	.. do	.....	.....	.....	....do.
4623	....	Rocky Mts., lat. 49°.	Aug. 28, 1874	J. H. Batty..	.....	.....	.....	....do.

LARUS FRANKLINI, *Rich.*

FRANKLIN'S ROSY GULL.

The egg of this species has been described by Prof. Alfred Newton, from a specimen taken in the adjoining British Province of Manitoba, and a specimen was shot on Turtle Mountain July 30, fully fledged, yet so young that I judged it had been hatched not far from the spot. No breeding colonies, however, of this or indeed any other Gull were observed by me in any portion of the region surveyed.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3379	....	Turtle Mt., Dak	July 30, 1873	Elliott Coues	13.75	33.75	9.75	Skin. Bill, 1.10; tarsus, 1.65; middle toe and claw, 1.65.

HYDROCHELIDON LARIFORMIS, (*Linn.*) *Coues.*

Black Tern.

This, the only representative of the *Sterninæ* observed by the Commission, was found breeding at Pembina in June, and subsequently seen during August along the Mouse River. On one of the prairie sloughs at Pembina—the same that I have spoken of as the breeding resort of the Yellow-headed Blackbirds—a colony of perhaps twenty pairs was established. As usual during the breeding-season with Terns, the birds were very fearless when their nesting-place was invaded, and I regret to say that the colony was broken up in consequence, as I desired to secure a good series of specimens in full dress. No eggs were found until the latter part of the month. It required sharp scrutiny to discover them, as they lay, without any preparation for their reception, directly upon the soaking, matted masses of last year's reeds, and were closely assimilated in color. They were indifferently two or three in number, oftener the latter; average samples measured 1.35 in length by 0.95 in breadth. The coloration is not peculiar in comparison with that of other Terns' eggs.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3023	♀	Pembina, Dak	June 17, 1873	Elliott Coues	.....	.....	.....	Skin.
3024	♀	....do	....do	....do	.....	.....	.....	....do.
3025	♂	....do	....do	....do	.....	.....	.....	....do.
3026	♀	....do	....do	....do	.....	.....	.....	....do.
3027	♂	....do	....do	....do	.....	.....	.....	....do.
3028	♀	....do	....do	....do	.....	.....	.....	....do.
3029	♀	....do	....do	....do	.....	.....	.....	....do.
3030	♂	....do	....do	....do	.....	.....	.....	....do.
3031	♀	....do	....do	....do	.....	.....	.....	....do.
3032	♀	....do	....do	....do	.....	.....	.....	....do.
3033	♀	....do	....do	....do	.....	.....	.....	....do.
3034	♂	....do	....do	....do	.....	.....	.....	....do.
3035	♀	....do	....do	....do	.....	.....	.....	....do.
3036	♂	....do	....do	....do	.....	.....	.....	....do.
3037	♂	....do	....do	....do	.....	.....	.....	....do.
3038	♂	....do	....do	....do	.....	.....	.....	....do.
3039	♀	....do	....do	....do	.....	.....	.....	....do.
3162	....	....do	June 25, 1873	....do	.....	.....	.....	....do.
3163	....	....do	....do	....do	.....	.....	.....	....do.
3164	....	....do	....do	....do	.....	.....	.....	....do.
3172	....	....do	....do	....do	.....	.....	.....	....do.
3186	♀	....do	June 27, 1873	....do	.....	.....	.....	Skin, with 3 eggs.
3462	....	Mouse River, Dak ..	Aug. 10, 1873	....do	.....	.....	.....	Skin.
3463	....	....do	....do	....do	.....	.....	.....	....do.
3478	....	....do	....do	....do	.....	.....	.....	....do.

PODICEPS AURITUS CALIFORNICUS, (*Heerm.*) *Coues.*

AMERICAN EARED GREBE.

I was much interested to find this species (not common in collections, and until recently supposed to be exclusively Western) breeding abundantly on Turtle Mountain, one of the easternmost localities where it has been observed. Toward the latter part of July and during the first two weeks of August, the young, still unable to fly, and in charge of the parents, were observed at the locality mentioned, and at points along the Mouse River. Some old birds in full breeding-dress were secured. With these the change begins in August, but traces persist for several weeks. I noticed nothing peculiar in the habits of the species.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3367	....	Turtle Mountain, Dak.	July 28, 1873	Elliott Coues.	12.50	22.50	5.25	Skin. Iris scarlet; edge of eyelids orange; bill black; feet olivaceous, blackish on outer side and on soles.
3392	....	....do	Aug. 1, 1873	....do	.....	.....	.....	Skin.
3454	♂	Mouse River, Dak ..	Aug. 10, 1873	....do	14.00	24.00	.....	....do.
3471	....	....do	.....do	....do	13.10	22.50	.....	....do.
3529	♀	....do	Aug. 16, 1873	....do	.....	.....	.....	....do.
3530	♂	....do	.....do	....do	.....	.....	.....	....do.
3531	....	....do	.....do	....do	.....	.....	.....	Skin; young of Nos. 3529–30.
3559	....	....do	Aug. 23, 1873	....do	12.00	23.50	4.75	Skin.
3566	....	....do	.....do	....do	13.25	22.25	.....	....do.
3574	♀	....do	Aug. 24, 1873	....do	12.80	21.85	.....	....do.
3575	....	....do	.....do	....do	.....	.....	.....	....do.
3584	....	....do	Aug. 25, 1873	....do	11.30	20.50	.....	....do.
3716	....	....do	Sept. 2, 1873	....do	11.60	22.00	4.75	....do.
3741	....	....do	Sept. 9, 1873	....do	.....	.....	.....	....do.
3742	....	....do	.....do	....do	.....	.....	.....	....do.
4670	....	Headwaters of Milk River, Mont.	Aug. 30, 1874	....do	.....	.....	.....	....do.
4671	....	....do	.....do	....do	.....	.....	.....	....do.

PODICEPS CORNUTUS, *Gm.*

HORNED GREBE.

Like the last species, the Horned Grebe was found breeding in the Red River region. On the 20th of June, 1873, I took a set of four newly laid eggs from one of the prairie sloughs near Pembina. They were deposited on a matted bed of decaying reeds soaking in the water. Later in the same season, during the latter part of July, newly hatched young were observed swimming on the pools about the base of Turtle Mountain. In this locality, and elsewhere, in August and September, the two species were generally found together; and both were very abundant.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3063	....	Pembina, Dak	June 20, 1873	Elliott Coues.	.....	.....	.....	Set of 4 eggs.
3361	....	Turtle Mountain, Dak.	July 26, 1873	....do	.....	.....	.....	Skin.
3362	....	....do	....do	....do	.....	.....	.....	....do.
3363	....	....do	....do	....do	.....	.....	.....	....do.

PODILYMBUS PODICEPS, (*Linn.*) *Lawr.*

DABCHICK.

Observed in the same situations as the last two species, but less frequently than either of them. Chicks still unfledged were taken so late as August 7. The streaking of the head of the young bird, supposed to be peculiar to this species, and once made the basis of a new species, is shared by others, as *P. cornutus*, for example.

List of specimens.

Coll. No.	Sex.	Locality.	Date.	Collector.	Length.	Extent.	Wing.	Nature of specimen, and remarks.
3413	....	Turtle Mountain, Dak.	Aug. 7, 1873	Elliott Coues.	....	.....	.....	Skin (young).
3455	....	Mouse River, Dak ..	Aug. 10, 1873	....do	14.00	24.75	.....	Skin.

BIBLIOGRAPHICAL APPENDIX.

Besides the several general works on North American Ornithology which bear in due part upon the Birds of the region surveyed, the following special treatises since Lewis and Clarke, relating to the Avifauna of the Boundary and adjacent portions of the country, may be advantageously consulted :—

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1837. **Townsend, J. K.** Description of Twelve New Species of Birds, chiefly from the vicinity of the Columbia River. <Journ. Acad. Nat. Sci. Phila. vii, 1837, pp. 187–193.

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1850. **Cabot, J. E.** Lake Superior: its Physical Character, Vegetation and Animals [etc.] By Louis Agassiz. Boston: Gould, Kendall and Lincoln. 1850. 1 vol. 8vo.

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1852. **Hoy, P. R.** Notes on the Ornithology of Wisconsin. < Trans. Wisc. State Agric. Soc. 1852, pp. 341–364. Also, < Proc. Acad. Nat. Sci. Phila. vi, 1853, pp. 304–313, 381–385, 425–429.

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1855. **Head, J. F.** Some Remarks on the Natural History of the Country about Fort Ripley, Minnesota. < Ninth Ann. Rep. Smiths. Inst. for 1854, 1855, pp. 291–293.

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1858–9. **Maximilian, Prinz zu Wied.** Verzeichniss der Vögel, welche auf einer Reise in Nord-America beobachtet wurden. < Journal für Ornith. vi, 1858, pp. 1–29, 97–124, 177–205, 257–284, 337–354, 417–445; vii, 1859, pp. 81–96.

1859. **Blakiston, T.** Scraps from the West. < Newman's Zoologist, xvii, 1859, pp. 6318–6325, 6373–6376.

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1860. **Cooper, J. G.**, *and* **Suckley, G.** The Natural History of Washington Territory. 4to.

A reissue, under another name, of parts of the xii. vol. of the Pacific Railroad Survey Reports, and containing a general treatise on the Ornithology of Washington Territory.

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1872. **Allen, J. A.** Notes of an Ornithological Reconnoissance of Portions of Kansas, Colorado, Wyoming and Utah. <Bull. Mus. Comp. Zool. iii, No. 6, 1872, pp. 113–183.

Contains much important matter.

1872. **Bruhin, T. A.** Unsere gefiederten Wintergäste. <Zool. Gart. xiii, 1872, pp. 157, 158.

Notes on a few winter birds of Wisconsin.

1872. **Holden, C. H.**, *and* **Aiken, C. E.** Notes on the Birds of Wyoming and Colorado Territories. By C. H. Holden, Jr. With additional Memoranda by C. E. Aiken. Edited by T. M. Brewer. <Proc. Bost. Soc. Nat. Hist. xv, 1872, pp. 193–210.

142 species treated.

1873. **Coues, E.** Notes on Two little-known Birds of the United States. <Amer. Nat. 1873.

Centronyx bairdi and *Neocorys spraguii*; observations made by the Boundary Commission.

1873. **Merriam, C. H.** Report on the Mammals and Birds of the Expedition. <Sixth Ann. Rep. U. S. Geol. Surv. (Hayden's) for 1872, 1883, pp. 661–715.

Treats of numerous birds of Wyoming, Idaho, &c.

1873. **Trippe, T. M.** Notes on the Birds of Southern Iowa. <Proc. Bost. Soc. Nat. Hist. xv, 1873, pp. 229-242.

Treats of 162 species.

1874. **Allen, J. A.** Notes on the Natural History of Portions of Dakota and Montana Territories, etc. < Proc. Bost. Soc. Nat. Hist. xvii, 1874, pp. 33–86.

Birds, pp. 44–68. Annotated list of 118 species.

1874. **Coues, E.** Birds of the Northwest: A Handbook of the Ornithology of the Region drained by the Missouri River and its Tributaries. Washington: Government Printing Office. 1874. 1 vol. 8vo. pp. xii, 791.

1874. **Coues, E.** On the Nesting of Certain Hawks, etc. < Amer. Nat. viii, 1874, pp. 596–603.

Field-notes made by the Boundary Commission in Montana in 1874.

1874. **Hoy, P. R.** Some of the Peculiarities of the Fauna near Racine [Wisconsin]. < Trans. Wisc. Acad. ii, 1874, pp. 120–122.

1875. **Grinnell, G. B.** Report of a Reconnoissance of the Black Hills of Dakota, made in the Summer of 1874. By William Ludlow, [etc.] Washington. Government Printing Office. 1875. 4to. p. 121.

Zoological Report by George Bird Grinnell. Birds, pp. 85–102. Field-notes on 110 species.

ART. XXVI.—NOTES ON A COLLECTION OF FISHES FROM THE RIO GRANDE, AT BROWNSVILLE, TEXAS—CONTINUED.*

By D. S. Jordan, M. D.

A portion of the collection of fishes from the Rio Grande noticed on pp. 395–406 of this Bulletin were accidentally separated from the rest, and escaped attention until the preceding pages had gone to press. In this lot are the following additional species:—

Genus XENOTIS Jordan.

Xenotis breviceps (Baird & Girard) Jordan.

1853—*Pomotis breviceps* B. & G., Proc. Ac. Nat. Sc. Phila. p. 390.
Pomotis breviceps B. &. G., Marcy's Expl. Red River, Zool. p. 246, pl. 13, 1853.
Pomotis breviceps Girard, U. S. Pac. R. R. Expl. Fishes, p. 28, 1858.
Ichthelis breviceps Jordan & Copeland, Check List Fishes N. A. p. 138, 1876.
Xenotis breviceps Jordan, Bull. U. S. Nat. Mus. x, p. 36, 1877.
1854—*Pomotis nefastus* B. & G., Proc. Ac. Nat. Sc. Phila. p. 24 (not *Pomotis aquilensis* B. & G.).
1858—*Pomotis popei* Girard, Pac. R. R. Expl. Fishes, p. 26.
Xenotis popii Jordan, Bull. U. S. Nat. Mus. x, p. 36, 1877.

A single half-grown specimen, agreeing well with the descriptions of *nefastus* and *popii*, but not distinguishable by me from *X. breviceps*, which species seems to be generally distributed in Texas. The specimens in the National Museum labelled (by Dr. Girard?) *Pomotis aquilensis* include two species, the one a *Xenotis*, and probably identical with *Xenotis breviceps*, the other a *Lepiopomus*, probably identical with *Lepiopomus pallidus*. The original *aquilensis* belonged to the latter type, so the name may be provisionally treated as a probable synonym of *pallidus*. The other specimens are probably those originally called *nefastus*, and seem to be referable to *Xenotis breviceps*. *X. breviceps* is closely related to *X. fallax*, but appears to be distinct.

Genus PŒCILICHTHYS Agassiz.

(*Astalichthys* Le Vaillant; *Oligocephalus* Girard.)

Pœcilichthys lepidus (Baird & Girard) Girard.

1853—*Boleosoma lepida* B. & G., Proc. Ac. Nat. Sc. Phila. p. 388.
Pœcilichthys lepidus Girard, Mex. Bound. Surv. Ich. p. 11, pl. 8, f. 14–17, 1859.
Oligocephalus lepidus Girard, Proc. Ac. Nat. Sc. Phila. p. 67, 1859.

*[From p. 406, *anteà*.—Ed.]

Boleosoma lepidum GÜNTHER, Cat. Fish. Brit. Mus. i, p. 77, 1859.
Boleosoma lepidum LE VAILLANT, Recherches sur les Poissons des Eaux Douces de N. A. (*Etheostomatidæ*), p. 90, 1873.
Pœcilichthys lepidus JORDAN & COPELAND, Check List, p. 163, 1876.
Pœcilichthys lepidus JORDAN, Bull. U. S. Nat. Mus. x, p. 16, 1877.

Several small specimens agreeing closely with Girard's figure and description, excepting that the spinous dorsal is higher and the two dorsals more closely approximated than is represented by him. This species appears to be a typical *Pœcilicthys*, related to *P. variatus*. The dusky transverse bars were doubtless blue in life. Girard's original types from Rio Leona, Texas, are still preserved in the museum.

Genus FUNDULUS Lacépède.

FUNDULUS ZEBRA (Girard) Günther.

1859—*Hydrargyra zebra* GIRARD, Proc. Ac. Nat. Sc. Phila. p. 60.
Fundulus zebra GÜNTHER, Cat. Fish. Brit. Mus. vi, p. 324, 1867.
Fundulus zebra JORDAN & COPELAND, Check List Fishes N. A. p. 141, 1876.

Numerous specimens, agreeing very well with Girard's account. This species has a much larger anal fin than *Hydrargyra similis*, with which it is associated in this collection. The specimens are also much shorter and more chubby than *H. similis*, and different in coloration. The general hue is dark olive, crossed by numerous irregular, whitish zones, about as wide as the darker interspaces. These bands are quite variable in number and position, some specimens having fully twice as many as others.

The coloration is very similar to that of *Fundulus menona* Jordan and Copeland, from Wisconsin and Northern Illinois. The specimens are not in good enough condition for me to be certain as to the number of branchiostegals. I, however, count five, and therefore refer the species to *Fundulus* rather than to *Hydrargyra*.

Genus CAMPOSTOMA Agassiz.

CAMPOSTOMA FORMOSULUM Girard.

Further specimens of this species indicate that it differs from *C. anomalum* in the smaller and more pointed head, and in the much greater compression and elevation of the body in the adult. The scales are also rather smaller than in *C. anomalum*.

Genus PIMEPHALES Rafinesque.

(*Pimephales* Rafinesque; *Hyborhynchus* Agassiz.)

PIMEPHALES NIGELLUS (Cope) Jordan.

1876—*Hyborhynchus nigellus* COPE, Rept. Lieut. Wheeler's Expedition W. 100th Meridian, p. 671.
Hyborhynchus nigellus JORDAN & COPELAND, Check List Fishes N. A., p. 147, 1876.
1878—*Pimephales promelas* JORDAN, p. 402 of the present paper (not of Rafinesque).

Examination of larger and better-preserved specimens of the species referred to on page 402 as *Pimephales promelas* shows that they do not truly belong to that species, but to Professor Cope's *Hyborhynckus nigellus*. In my opinion, the group called *Pimephales* and *Hyborhynckus* can no longer be regarded as distinct genera. The present species has entirely the appearance of *Pimephales;* in fact, it carries the peculiar form and coloration of that genus to an extreme. Its lateral line is, however, almost as complete as in *Hyborhynchus*. The tubes are, however, entirely wanting on the last four or five scales, and irregularly so on some of the scales along the sides. The description given by Professor Cope is entirely accurate. One of my specimens is, however, still blacker, the whole dorsal fin and nearly the whole head being jet-black.

Genus CYPRINELLA Girard.

CYPRINELLA COMPLANATA (Girard) Jordan.

1856—*Moniana complanata* GIRARD, Proc. Ac. Nat. Sc. Phila. p. 200.
Moniana complanata GIRARD, U. S. Mex. Bound. Surv. Ichthyol. p. 56, pl. 31, f. 17–20, 1859.
Moniana complanata JORDAN & COPELAND, Check List Fishes, p. 153, 1876.
1856—*Moniana couchi* GIRARD, Proc. Ac. Nat. Sc. Phila. p. 201.
Moniana couchi GIRARD, U. S. Mex. Bound. Surv. Ichth. p. 57, pl. 30, f. 21–24.
Moniana couchii JORDAN & COPELAND, Check List Fishes, p. 154, 1876.
1856—*Moniana gibbosa* GIRARD, Proc. Ac. Nat. Sci. Phila. p. 201.
Moniana gibbosa GIRARD, U. S. Mex. Bound. Surv. Ichthyol. p. 57, pl. 30, f. 9–12.
Moniana gibbosa JORDAN & COPELAND, Check List Fishes N. A. p. 153, 1856.
1878—*Cyprinella bubalina* JORDAN, present paper, p. 403.

Examination of additional specimens has shown me that the dental formula, 1–4, 4–1, noticed on my first specimen, was probably accidental, and that the reference of most or all of these deep-bodied *Cyprinellæ* to *C. bubalina* is erroneous. Girard's types of his *gibbosa* and *complanata* were from Brownsville. My specimens agree fairly with the figures of both,—decidedly best with *gibbosa*, however. The descriptions of both—as of all his species of *Moniana*—are valueless. The younger specimens agree well with the figure of *M. couchi*, which, coming from the neighboring province of New Leon, is very likely the same. I therefore unite *couchi*, *gibbosa*, and *complanata* under the oldest name, *complanata*, although, as above stated, the figure of *gibbosa* is the most satisfactory. A characteristic color marking will probably usually distinguish what I call *complanata* from related species. The membrane between the branches of the lower jaw in most specimens bears a conspicuous black spot. In a very few, however, this is silvery. *Cyprinella forbesi*, lately described by me from Southern Illinois, is a closely related species, but wants this spot, and is somewhat different in form. These small fishes are exceedingly difficult, and until some one can study a large series of fresh specimens representing the different species, any arrangement of them must be regarded as merely provisional. Dr. Girard's treatment

of them is perhaps as unsatisfactory a piece of work as has yet been done in American ichthyology. Any one who doubts this may read the descriptions of *Moniana couchi*, *Moniana rutila*, and *Moniana gracilis* as given by Girard, and then, as suggested by Dr. Günther, compare with each other the two figures given of *Moniana frigida*. The descriptions are throughout worthless for purposes of identification, and the figures are executed by an artist who made in the same way all the fishes drawn "at one sitting". *Moniana alburnellus*, *Cliola*, *Meda*, *Algoma*, *Dionda*, or what not, the figures show the same physiognomy.

Genus PHENACOBIUS Cope.

(*Phenacobius* Cope; *Sarcidium* Cope.)

PHENACOBIUS SCOPIFERUS (Cope) Jordan.

1872—*Sarcidium scopiferum* COPE, Hayden Geol. Surv. Wyoming, 1870, p. 440.
Sarcidium scopiferum JORDAN & COPELAND, Check List Fishes N. A. p. 146, 1876.
Phenacobius scopiferus, JORDAN, Man. Vert. ed. 2d, p. 299, 1878.
1876—*Phenacobius teretulus* var. *liosternus* NELSON, Bull. Ills. Mus. Nat. Hist. i, p. 46. 1876.
Phenacobius liosternus JORDAN & COPELAND, Check List, p. 149, 1876.

A single good specimen, apparently belonging to Professor Cope's species. The head is, however, shorter and thicker than in the types of *scopiferus*, and the body is stouter. The head is contained $4\frac{3}{5}$ times in the length, being thus about equal to the depth of the body. I am not, however, disposed to consider it a "new species", inasmuch as in other respects it agrees with *scopiferus*. *P. mirabilis* (*Exoglossum mirabilis* Grd.) has apparently a more slender body and smaller scales. These species have much narrower lips than the typical *Phenacobii*, *teretulus*, *uranops*, etc., but *Sarcidium* can hardly be considered as a distinct genus.

Genus CARPIODES Rafinesque.

CARPIODES CYPRINUS (Le Sueur) Agassiz.

Since the remarks on this species, on page 405, were in press, I have examined a fine example of *Carpiodes grayi* Cope, collected in the Rio Grande by Dr. Loew. It is evidently identical with my specimens from Brownsville, and agrees in every respect with the figure of *Ictiobus tumidus* in the Mexican Boundary Survey. Moreover, it is not distinguishable from typical examples of *Carpiodes damalis* from the Platte River, which in turn cannot be at present separated from the Eastern *Carpiodes cyprinus*. Wherefore I propose to unite all these nominal species under the oldest name, as *Carpiodes cyprinus* (Le Sueur) Agassiz, until some positive difference is shown. The species as thus defined would range from the Delaware River to the Alabama east of the Alleghanies, thence to the Rio Grande and the headwaters of the Kansas and the Platte. It is not yet known from the Great Lake Region nor from the Ohio.

DACENTRUS LUCENS, *gen. et sp. nov.*

I find four more specimens of the small Labroid fish referred to on page 399. These are larger and in better condition than the first one, and I have been enabled to examine the lower pharyngeals of one of them. These I find to be united, as usual in this group, into a broad triangular bone, in which I am unable to find a median suture. This bone is covered with rather large, close-set, bluntish-conical teeth. As the lateral line is complete, and the scales cycloid, I place this fish among the *Labridæ*, rather than among the *Cichlidæ*, but I am entirely unable to locate it among the genera of that family known to me. Indeed, I find no description of any species on our coasts to which it bears any special resemblance. Although taken in fresh waters, and occurring in a collection of fresh-water species, it is very likely a salt-water fish. The present notice is rather to call attention to this fish than to complete its history. In describing the species, I make at present no attempt to separate its generic from its specific characters. The etymology of *Dacentrus* is δα, an intensive particle; κεντρον, a spine, in special allusion to the long second spine of the anal fin. Body ovate, strongly compressed, the form Sunfish-like, much as in the genus *Centrarchus*, the depth being contained (in young of less than 2 inches) $2\frac{1}{2}$ times in the length. Head large, moderately pointed, its length $2\frac{7}{8}$ times in that of the body, its upper outline concurrent with that of the back, not making an angle with it; mouth not large, the jaws about equal, the maxillary not reaching to the front of the orbit; upper jaw quite protractile; the lips not very fleshy; teeth in jaws moderate, conical, apparently in a single series; eye large, 3 in head, its position rather anterior; cheeks with three rows of rather large, silvery scales; opercles in all my specimens bare and silvery; none of the opercular bones serrated; gill-rakers pretty long and slender, rather closely set. Branchiostegals uncertain, probably five.

Scales rather large, silvery, cycloid; their number about 5–37–11. Lateral line running high up, concurrent with the back, *continuous*, not interrupted or deflected, very distinct.

Fin-rays:—Dorsal, about XVIII, 10; anal, III, 20, or thereabouts; ventrals, I, 5; spinous portion of dorsal much longer than the soft part, the spines gradually increasing in height to about the sixth, then more gradually diminishing, the highest spine a little less than half the length of the head. Along the base of the spinous dorsal is a sheath of rather large silvery scales. Anal spines somewhat curved, the second spine considerably longer than the first and third. Pectoral fins barely reaching anal; ventral fins rather short; caudal fin so broken that its form cannot be ascertained.

Colors obliterated. The typical specimens are silvery, darker above, without distinct markings anywhere. There are five of these, varying in length from $1\frac{1}{2}$ to $1\frac{3}{4}$ inches. They are doubtless the young of some fish which reaches a considerable size.

ART. XXVII.—PRELIMINARY STUDIES ON THE NORTH AMERICAN PYRALIDÆ.

I.

By A. R. Grote.

To Prof. P. C. Zeller, Stettin, Germany.

In the present paper I have discussed as fully as possible the structure of certain genera of North America *Phycidæ*. Several of our species are found to be destructive to forestry and agriculture. I have also described a small group, characterized by the flattened clypeus and by the male antennæ having a basal tegumentary prolongation, under the name *Epipaschiæ*. In the *Pyralididæ*, I have made some new synonymical references and generic descriptions, and also enumerated the species of N. Am. *Botis* which I have seen. I am much obliged to Doctor Packard for an opportunity of examining most of his types in this family. A sense of the obligation which science at large owes to Professor Zeller, as well as my own indebtedness to him for determinations, has prompted my dedication of this little paper.

PYRALIDIDÆ.

Prorasea, *n. g.*

Ocelli prominent. Front with a strong clypeal protuberance, its outer face mesially impressed. Maxillary palpi linear, as long as the second joint of the labial palpi, which latter are moderately long, linear, a little flattened, with moderate third joint. The scales on the vertex depend in front of the antennæ at base. Antennæ simple, ciliate beneath. Fore wings produced at apices, with oblique external margin, entire, 12-veined; 9 out of 8, a short furcation; 4 and 5 separate, near together at base. Hind wings 8-veined; three internal veins counted as one; 4 and 5 separate, near together at base, where they are connected by a cross-vein; 5 continuous with the cross-vein closing the cell. Edge of both wings a little uneven.

This genus has a resemblance to the Noctuid genus *Acopa* of Harvey in the shape of the wings and somewhat in color. It may be distinguished by the oblique transverse lines on the fore wings, the absence of the thoracic tuft behind, and the neuration, while the clypeal protuberance is greatly more prominent. The neuration agrees with the following genus *Aedis*, except that on the hind wings veins 4 and 5 do

not spring from one point. I should precede *Omphalocera* with both these Western genera.

Prorasea simalis, n. s.

♂ ♀. Ocherous, sometimes more or less fuscous or blackish, variable in tone. Fore wings with indistinct oblique lines, flecked with white. Median space ocherous, narrowed below median vein. Median lines dark, fine, the outer much projected subcostally, oblique. Subterminal space fuscous or ocherous. Subterminal shade white, more or less indistinct superiorly, with a notch on submedian fold. Discal dots with a white spot between them at the place of the reniform; this discal mark often difficult to make out. Fringes white at base, interlined. A terminal punctiform black or dark line. Hind wings smoky-fuscous, paler at base, with an external line picked out by a following pale shade, and submedially sometimes white-flecked. A terminal, blackish, punctiform line. Fringes white at base, doubly interlined. Beneath pale, soiled yellow-fuscous with fine, common, exterior line and short double lines on primaries in place of the discal mark. White shades accompany the median lines on the primaries above. Body fuscous-ocherous, paler beneath. Expanse, ♂, 22; ♀, 26 to 29 mil. Eight or ten specimens examined under the number "5939", and collected by Mr. Hy. Edwards in Oregon. Also collected by Hayden's Survey in Montana.

AEDIS, *n. g.*

Front narrow, smooth, clothed with thin, converging squamation. Ocelli prominent. Maxillary palpi linear, as long as the second article of the labial palpi, these latter narrow, with moderate third article. Male antennæ scaled above, ciliate beneath, the joints improminent. The supra-caputal scales diverge between the antennæ at base, forming two inconspicuous, decumbent tufts. Wings ample. Fore wings 12-veined; veins 4 and 5 separate, 5 near 4 from the cross-vein; 9 out of 8, a short furcation to costa. Hind wings 8-veined; 3 just before the lower angle of the cell, 4 and 5 together from the lower angle of the cell, which is closed, 8 out of 7 beyond 6. This form seems to have some resemblance to *Exarcha* in the shape of the wings. In the neuration of primaries, it agrees with *Prorasea*.

Aedis funalis, n. s.

♂ ♀. Primaries whitish-gray or brown. Outer transverse line black, distinct, inwardly oblique, a little rounded below costa. Between this and the base the markings are obsolete. Beyond it, the wing is shaded with bright brown, especially centrally. Some black streaks below apices and at internal angle before the narrow subterminal line. Fringes dark. Hind wings pale fuscous; fringes narrowly interlined. A fine, dark, sometimes punctate, terminal line. Hind border touched with fuscous. An outer transverse line distinct over the middle of the wing. Beneath

with an outer common line, pale fuscous. Body whitish beneath, fuscous above. California, Mr. Behrens and Hy. Edwards, Esq. The moth expands 28 mil. In the type, the inner transverse line, very fine and indistinct, may be made out; it goes to a black shade on internal margin, connected by black scales on the edge of the wing to the base of the outer line. The black longitudinal dashes to the subterminal line below the apices are variably distinct.

STEMMATOPHORA *Guen.*

Stemmatophora nicalis, n. s.

♀. Ocelli. Maxillary palpi small. Aspect of *Asopia*. Deep reddish-fuscous; thorax and basal fields of the fore wings somewhat olivaceous. Median lines distinct, whitish. The anterior upright with a submedian, rounded, outward projection. Posterior line broadly marked on costa, outwardly rounded superiorly, running inwardly to vein 2, where it forms a slight sinus, thence more straightly to internal margin. It is defined on the inside by a narrow reddish line. Discal dots both present, appearing as darker cloud-spots. Median space a little paler than the rest of the wing, shaded with pale yellowish on the interspaces posteriorly. Beyond the line, the wing is evenly obscure reddish-fuscous; fringes paler, indistinctly interlined. Hind wings fuscous, with paler bases and a whitish, incomplete, extramesial line. Beneath paler than above; the outer yellowish line broadly marked on primaries; on secondaries, a narrow, brown, mesial line. Body pale beneath. The brown terminal spaces on both wings contrast with the paler portion within the line. Expanse, 24 mil. One specimen, in good condition. Sierra Nevada, Cal.

OMPHALOCERA *Lederer.*

Omphalocera cariosa Led., 339, taf. 6, fig. 11.

♂ ♀. Two specimens from Missouri (Riley) agree very well with Lederer's figure and description; in these there is a reddish cast to the fore wings, which is wanting in a larger female taken by myself in Alabama. Lederer gives as localities: "North America, Brazil."

ASOPIA *Tr.*

Asopia farinalis (Linn.).

New England; Middle States; also from Texas, Belfrage, No. 416, October 16. Lederer gives as localities: "Europe, America, Australia." Probably introduced by commerce.

Asopia costalis (Fabr.).

Pyralis fimbrialis S. V.

♂ ♀. This species is found, according to Zeller, but rarely in North Germany, and not at all in England. Zeller doubts that Riley and Packard, who describe the larva from American specimens found feed-

ing in numbers on clover, really intend this species, and not *olinalis*, which latter is a purely American form. But I recollect determining the species originally for Mr. Riley, and there can be no doubt that the present species is the one they described, although in the terms used for color both Riley and Packard may have been inexact. It is not credible that they have mixed the two species in their illustrations or descriptions. It is curious that in North America the insect is more common than on the continent; and the question of its introduction is an open one. I have not seen it from Texas. The specimens before me are from New York. Lederer says that a male of this species sent him through Professor Zeller from New York agrees exactly with the European specimens.

Asopia olinalis Guen., p. 118.

Asopia trentonalis Schlaeger, Led. p. 343, taf. 7, fig. 2.

♂ ♀. Varies in size and depth of color. New York and Texas (Belfrage, No. 356).

Asopia binodulalis Zell., Beitr. 1, 501.

♂. One specimen of this species is before me. It looks like a variety of *olinalis*, but the fringes are not yellow. The outer line is a little more outwardly bent than in *olinalis*. Texas (Belfrage, No. 358).

Asopia himonialis Zell., Beitr. 1, 500.

I do not know this Massachusetts form, which is said by Zeller to have the fringes not quite so brightly golden-yellow as *costalis*, and to be as large as the largest *olinalis*. It cannot be *devialis* from the characters given to the transverse lines and the general color.

Asopia devialis Grote, Bull. B. S. N. S. 2, 229.

♂. This form is large, of a faded yellow, sometimes with a faint purple tinge, besprinkled with dark scales; the fringes are concolorous with the wing, faded ochery or yellowish. Lines dark, followed by pale shades. The outer line is denticulate, forming four or five dark points below the pale costal blotch. The costal hooklets between the lines are obsolete; with difficulty under the glass I can make out three of them. Quebec (Bélanger); Albany, N. Y. (Professor Lintner and Mr. Hill).

Asopia squamealis Grote, Bull. B. S. N. S. 1, 172, and 2, 229.

♂ ♀. Primaries deep red, sprinkled with black. Fringes on primaries blackish; on secondaries paler, both interlined; black terminal lines distinct. Wings narrow. On fore wings, the lines wide apart, exterior line slightly denticulate; the lines black, followed by faint yellow shades; between the lines are five costal dots surrounded with black scales. Hind wings blackish, with distinct exterior line and the terminal margin washed with red. Hastings, N. Y., in June; also taken by myself near Buffalo in July. A very distinct species, which I have determined myself in different collections.

ARTA *Grote.*

In this genus, the fore wings are a little squarer than in *Asopia*. The ocelli are present. Fore wings 11-veined, 4 and 5 furcate; 8 and 9 out of 7. Hind wings 8-veined, 2 before the lower angle of the cell, 3, 4, and 5 in succession from the submedian vein; cell open or partially closed, 8 out of 7 a short furcation; 6 connected with 7 by a short vein. The species are small. I only make out 2 internal veins on secondaries.

Arta statalis Grote, Bull. B. S. N. S. 2, 230.

The fore wings are vinous-red, with two narrow, upright, approximate, yellow, median lines; the inner line brought well toward the middle of the wing. Fringes darker than the wing. Hind wings fuscous. Beneath fuscous, the costæ tinged with red more or less diffused. The expanse is 16 mil. My three female specimens are all from New York.

Arta olivalis Grote, Can. Ent. x, 23.

♂ ♀. A small species resembling *statalis*, but differing by the olivaceous cast of the primaries above, crossed by two, parallel, faint, pale lines, the inner at the middle of the wing, the outer at within the middle of the outer half of the wing; fringes vinous; hind wings pale purplish, with vinous fringes. Beneath, the costal and external margins are bright wine-color, a pale common line. The expanse is 14 mil. Texas, Belfrage, in July and August (No. 405). The neuration has not been studied.

CONDYLOLOMIA *Grote.*

(Bull. B. S. N. S. 1, 176, plate 5, figs. 4, 5.)

I have again studied the neuration of this genus, in which the cell is so short on both wings. To the figure and description of the primary wing (fig. 4), I have nothing to add. The drawing of the hind wing (fig. 5) is defective in that vein 6 springs from the discal cross-vein, and not from the upper margin of the cell; the cell is closed by a concave fold. The median vein is too straight, but the branches are correctly drawn as to position. I find also only two internal nervures (Rippe 1, *a*); but in this it is possible I am wrong, although I can find only two in *Arta*.

I am indebted to the kindness of Mr. L. W. Goodell, of Amherst, Mass., for a specimen (No. 8) of the only species of this genus known, *Condylolomia participialis*.

CORDYLOPEZA *Zeller.*

Cordylopeza nigrinodis Zell., Beitr. ii, 6, taf. iii, fig. 3.

New York; near Buffalo, in July.

FABATANA *Walk.*

Fabatana oviplagalis Walk., Suppl. iv, 1265, ♀, (1865).

Asopia anthœcioides G. & R., Tr. Ent. Soc. Phil. 15, pl. 2, fig. 9, ♀, (1867).

I have before me only a single female, received from Mr. Dury (No. 13), from Cincinnati. The ocelli are present. It seems to be allied to the following genus, of which I have no material before me to examine.

SIPAROCERA *Robinson.*

Siparocera nobilis Rob., Ann. N. Y. Lyc. April, 1875.

Oecto-peria sincera Zell., Beitr. iii, 125, taf. x, fig. 45.

New York; Mr. Robinson's type (♂) I have seen in the Central Park collection.

MELANOMMA *Grote.*

Male antennæ bipectinate; the branches separate, ciliate, before their extremities bent, and with a longer exterior bristle. Ocelli present. Maxillæ moderate. Labial palpi with narrow and rather long third joint, porrect, as long as the front. Clypeus rather narrow, smooth, roundedly prominent. Fore wings with rounded costa, broad, obovate, 12-veined, 4 and 5 separate, 5 from the cross-vein near 4; 6 from the cross-vein opposite 5; 9 out of 8 a short furcation. Hind wings 8-veined; 2 from the median vein at beyond the middle; 3 and 4 from one point at the lower angle of the cell; 5 from the cross-vein well separated from 4; the subcostal vein is quite distinct from the costal (8), and throws off 6 and 7 beyond the closure of the cell; 8 entirely free, touching 7 at base, but then leaving it widely throughout its course; the cell has a median fold. I cannot detect the maxillary palpi. This genus has a resemblance to Lederer's Brazilian genus *Cryptocosma* in the pectinate antennæ and the presence of metallic marks on the gray wings. It differs very decidedly in structure, having both ocelli and maxillæ, and a totally distinct venation. The separation of 8 and 7 on the hind wings is unusually complete in *Melanomma*, except at base, where they touch without coinciding; the fact that 3 and 4 spring together from lower angle of the cell, while 5 is more widely separate, is interesting, and recalls other families; while the fore wings are like the *Pyralidæ*, the hind wings are like the *Geometridæ*. I can see also but two internal veins, but I have shown in other cases that the character of three internal veins may not be considered as invariable in the *Pyralidæ*. The body is narrow, abdomen tapering, exceeding the secondaries.

Melanomma auricinctaria Grote, Tr. Ent. Soc. Phil. 117, 1875.

♂. I have one specimen only before me, received from Mr. E. L. Graef, taken near Brooklyn, N. Y. The moth is gray, with transverse dark lines, recalling *Eupethecia*. The cell shows a black spot accompanied by

metallic scales, and with a narrow yellowish iris, much more distinct and complete beneath. The subterminal line shows metallic scales on both surfaces. I have discussed this species also in Can. Ent. 28, 1876.

EMPREPES *Lederer*.

Emprepes novalis Grote, Can. Ent. 156, 1876.
Texas (Belfrage, No. 403, Oct. 7).

Emprepes nuchalis, n. s.

Size of *novalis*, but differently colored, and with the anterior and posterior bands nearer together and better defined. Olivaceous. Fore wings with a broad, even, outwardly oblique, anterior, vinous-purple band; a costal spot of the same color at the middle of the median space, and an outer, subterminal, sinuous, upright band of the same hue. Hind wings fuscous; fringes a little paler than the wing. Expanse, 17 mil. California (Hy. Edwards, No. 3011). This species is entirely olivaceous, beneath paler, and differs by the subterminal limitation of the posterior band, among other characters. I have examined two specimens. I regret not to have been able, from paucity of material, to make any neurational examination of either of the above species.

Scoparia libella, n. s.

A small gray species less than half the size of the European and American *centuriella*. Fore wings with a blackish streak at base and one on submedian fold beyond the inner line. Lines white, tolerably distinct, inner arcuate, outer a little irregular, produced medially. Discal mark a curved, longitudinal, black streak, as if connecting spots. Subterminal line incomplete, whitish. Fringe white, dotted. Hind wings smoky, with white fringes. Beneath smoky; body white; anterior tibiæ and feet dotted. This species is of common occurrence, and may be known by its olive-gray tint and small size, expanding 15 millimeters. I have it from Maine, Massachusetts, and New York.

BOTIS *Schr.*

This generic term is sometimes incorrectly written "*Botys*". Professor Zeller follows Swainson's correction of the spelling. The North American species are numerous, and the following enumeration of those before me will assist the student. Several of our species described by European entomologists remain to be identified. I do not expect, however, that most of Mr. Walker's descriptions will be ever satisfactorily made out.

1. *Botis octomaculata* (Linn.).

Ennychia glomeralis Walk., C. B. M. Pyr. 330.

United States and Europe. I have observed this species in the vicinity of Buffalo. In color, ornamentation, and flight, it closely resembles the species of *Alypia*.

2. *Botis californicalis* Pack., Ann. N. Y. Lyc. 260, (1873).

I have two specimens from San Francisco, which may belong here (Behrens). I have not seen Dr. Packard's type.

3. *Botis insequalis* (Guen.).

Herbula subsequalis || Guen., Pyr. 177, pl. 8, fig. 3.

New York; Pennsylvania.

4. *Botis generosa* G. & R., Tr. Am. Ent. Soc. 1, 20, pl. 2, fig. 10.

New York; Pennsylvania.

5. *Botis matronalis* Grote, Bull. B. S. N. S. ii, 231.

Canada. Mr. Saunders has reared this species from the larva.

6. *Botis unimacula* G. & R., Tr. Am. Ent. Soc. 1, 14, pl. 2, fig. 8.

New York; Pennsylvania.

7. *Botis volupialis* Grote, Bull. Geol. Survey, 3, 799.

Hills west of Denver, Colo.

8. *Botis signatalis* (Walk.) G. & R., *l. c.* 16, pl. 2, fig. 11.

The name *vinulenta* G. & R. has been proposed for this species in case the present proves untenable, which is probable.

Texas (Belfrage, No. 368); Massachusetts; Pennsylvania.

9. *Botis atropurpuralis* Grote, Can. Ent. 9, 104.

Texas (Belfrage, No. 362).

10. *Botis diffissa* G. & R., *l. c.* 19, pl. 2, fig. 16.

Louisiana; Texas (Belfrage, No. 368).

11. *Botis phœnicealis* (Hübn.), Zutr. 1, 58, figs. 115, 116.

Texas (Belfrage, No. 366). The specimens sent by Belfrage are "trüb purpurroth und oraniengelb"; but the bands are narrower than in Hübner's figure. There is no discal dot, as in *diffissa*, which is brilliant vinous-red and golden-yellow.

12. *Botis laticlavia* G. & R., *l. c.* 17, pl. 2, fig. 12.

Texas (Belfrage, No. 360). As suggested by Professor Zeller (Beitr. 1, 59), I regard the following as a seasonal variety.

12 *b*. *Botis cinerosa* G. & R., *l. c.* 18, pl. 2, fig. 13.

Texas (Belfrage, No. 361).

13. *Botis sumptuosalis* (Walk.), C. B. M. 34, 1281.

B. haruspica G. & R., *l. c.* pl. 2, fig. 14.

? B. proceralis Led., 460.

Massachusetts; Pennsylvania.

14. *Botis onythesalis* (Walk.), Pyr. 734.

Texas (Belfrage, No. 364).

15. *Botis vibicalis* Zell., Beitr. ii, 8, taf. iii, fig. 4.

Texas (Belfrage, No. 407).

16. *Botis nasonialis* Zell., Beitr. ii, 9, taf. iii, fig. 6.

Texas (Belfrage, No. 406, May 15). California, September 3 (Behrens).

17. *Botis sesquialteralis* Zell., *l. c.* 9, taf. iii, fig. 5.

Texas (Belfrage, No. 406). I think I have this species of Zeller's before me sent under the same number with the foregoing by Belfrage. It is possible that the two are not distinct; *nasonialis* may be recognized by the pale yellow streaks along the veins. These three last are the smallest species of *Botis* known to me.

(*Diastictis* Hübn.)

18. *Botis argyralis* (Hübn.), Zutr. 1, 21, figs. 113, 114.

I have a specimen from the South which agrees with Hübner's figure in the pale yellowish primaries. I do not find any differences except color between this and the following. But Hübner's figure has the white spots larger and visible beneath; this may be varietal, and I merely keep the names separate provisionally. I do not see the character given by Zeller to *argyralis* (p. 509) to distinguish it from *ventralis*.

19. *Botis ventralis* G. & R., *l. c.* 21, pl. 2, fig. 23.

Massachusetts; Pennsylvania. I have both sexes of a dark brown like the ♂ of "*argyralis*" described by Zeller on page 508. It is probable that the female, with "fast dottergelbe Vorderflügel", is the same as the *argyralis* there described, which is also a female, but which has the white, lateral, abdominal stripes continuous. Unless we can find that the color is a specific character, I do not think there are other grounds for a separation.

20. *Botis fracturalis* Zell., taf. iii, fig. 16.

I have two (♂ ♀) specimens agreeing accurately with Zeller's figures, except that the male has the ground-color slightly tinged with ocherous. But I have another female (Belfrage, No. 384), which differs by being as yellow as *argyralis*, whereas *fracturalis* is as brown as *ventralis*. This female has besides the basal, silver, submedian mark transformed into an upright band, and the median fascia is broader and connected with the discal spot. If this is only a variety, which I believe it is, it will assist the idea that *ventralis* and *argyralis* are only color-varieties.

††

21. *Botis Harveyana* Grote, Can Ent. 9, 104.

New York; Texas (Belfrage)

22. *Botis profundalis* Pack., Ann. N. Y. Lyc. 261, 1873.

California. I have examined Dr. Packard's type. The exterior line makes a broad submedian sinus, which seems to be characteristic.

23. *Botis badipennis* Grote, Bull. B. S. N. S. 1, 88, pl. 2, fig. 12.

Maine; New York; Michigan, in August.

24. *Botis tatalis* Grote, Can. Ent. 9, 106.

Texas (Belfrage, No. 659, October 7).

25. *Botis allectalis* Grote, Can. Ent. 9, 107.

Texas (Belfrage, No. 445, May 12).

26. *Botis albiceralis*, n. s.

♂. Male antennæ simple, pubescent beneath. Palpi extended forward, fully as long as the head. Head and appendages and thorax pale ocherous. Fore wings gray, with an ocherous costal patch from the base outwardly, extending downward on the middle of the wing and absorbing the stigmata, narrowly defined by a brown line. Anterior line obsolete. Posterior line near the margin denticulate, narrow, whitish, bordered with dark gray, outwardly bent superiorly, but not flexuous. Subterminal line very near the margin, followed by two apical, narrow, brown teeth; terminal space ochery; a fine, brown, terminal line; fringes pale, interlined. Hind wings pellucid whitish, stained outwardly with ocherous; a continuous, denticulate, extramesial line, not flexed; fringes pale. Beneath largely pale ocherous; a brown discal lunule on primaries; a common, denticulate, extradiscal, brownish line, accentuated on costa. Expanse, 26 mil. Colorado Rio, Prof. Townend Glover; one specimen. This species resembles somewhat *B. allectalis* in colors, but is larger, and may be known by the ocherous costal patch of primaries absorbing the reniform, which appears as a brown stain near its outer edge. This costal patch is neatly edged with a brown line back to the place of the anterior line, where it narrows to base of wing.

27. *Botis mustelinalis* Pack., Ann. N. Y. Lyc. 262, 1873.

Botis catenulalis Grote, Can. Ent. 9, 105.

California. I have compared Dr. Packard's type.

28. *Botis fodinalis* Led., 369, taf. 8, fig. 9.

California. I have examined several ♂ ♀ specimens from Behrens and Edwards. It varies in size, distinctness of lines, and color.

29. *Botis socialis* Grote, Can. Ent. 9, 107.

My two specimens (Canada and Buffalo) are females. They are brighter-colored than *fodinalis*, the subterminal band on primaries more distinct, the spots solid and more evident, the primaries more red, the secondaries more yellow. Smaller than most of my California *fodinalis*, I yet think they will prove the same species.

30. *Botis reversalis* Guen., Pyr. 409.

Texas (Belfrage, No. 389, May 13).

31. *Botis penitalis* Grote, Can. Ent. 98, 1876.

This is rather a large species, expanding 29 mil. Kansas (Snow); larva on the Yellow Pond Lily (*Nelubium luteum*). Incorrectly compared by me with *crinitalis*.

32. *Botis erectalis* Grote, Can. Ent. 99, 1876.

New York (Lintner); Massachusetts (L. W. Goodell). Differs from the foregoing by its fuscous color, distinct lines, and plain and solid discal marks, while it is a little larger (34 mil.).

33. *Botis coloradensis* G. & R., *l. c.* 25, pl. 2, fig. 18.

Colorado; Texas (Belfrage, No. 379, April 24).

34. *Botis flavidalis* Guen., Pyr. 329.

C. cinctipedalis Walk., Pyr. Sup. 1391.

New York; Ohio; Alabama; Texas (Belfrage, No. 378).

35. *Botis Langdonalis* Grote, Can. Ent. 9, 10.

This fine species is as large as *flavidalis*, and is easily known by the broad fuscous-brown bands of the wings. Ohio (Langdon, Dury).

36. *Botis flavidissimalis* Grote, Can. Ent. 9, 105.

Texas (Belfrage, No. 383, November 5, 8).

37. *Botis trimaculalis* Grote, Can. Ent. 10, 24.

Texas (Belfrage, No. 375, October 4).

38. *Botis fuscimaculalis* Grote, Can. Ent. 10, 25.

Texas (Belfrage, May 5).

39. *Botis flavicoloralis* Grote, Can. Ent. 10, 25.

Texas (Belfrage, October 11).

40. *Botis citrina* G. & R., *l. c.* 23, pl. 2, fig. 20.

Long Island, N. Y.; Pennsylvania; Texas (*teste* Zeller).

41. *Botis marculenta* G. & R., *l. c.* 23, pl. 2, fig. 21.

New York (Grote); Pennsylvania; Texas (*teste* Zeller).

42. *Botis submedialis* Grote, Can. Ent. 8, 111.

Canada (Saunders); only one specimen.

43. *Botis pertextalis* Led., 371, taf. 9, fig. 10.

New York; five specimens, perhaps not different from the succeeding form.

44. *Botis gentilis* Grote, Bull. B. S. N. S. i, 173.

Botis Thesealis Zell. (non Led.), 514.

New York; four specimens, darker, smaller than the preceding, with the lines on the veins more distinct.

45. *Botis magistralis* Grote, Bull. B. S. N. S. i, 173.

Massachusetts; New York.

46. *Botis quinquelinealis* Grote, Bull. B. S. N. S. ii, 231.

New York; Massachusetts; Pennsylvania; six specimens. I sent a specimen of this to the British Museum during Mr. Walker's lifetime, and he informed me by letter that the species was not in the English collections, and he believed it undescribed.

47. *Botis abdominalis* Zell., Beitr. 1, 515.

I have two specimens from New York, one with the reniform, the other with both stigmata open, which is allied to 5-*linealis*, and from the description may be this species.

48. *Botis feudalis* Grote, Bull. B. S. N. S. ii, 231.

New York; Massachusetts; Ohio.

49. *Botis terrealis* (Tr.).

New York (Lintner); also European.

50. *Botis penumbralis* Grote, Can. Ent. 9, 106.

Ohio (Dury).

51. *Botis obumbratalis* Led., taf. 9, fig. 17.

Maine (Packard). I have identified this species in a collection sent me some time ago by Dr. Packard, but have now no specimens before me.

52. *Botis dasconalis* Walk., Led. taf. 1, 2, fig. 5.

Maine; New York. I have identified this species, but have no specimens of my own at the present writing.

53. *Botis venalis* Grote, Can. Ent. x, 24.

New York (Buffalo, Grote).

54. *Botis magniferalis* Walk., Can. Nat. and Geol. vi, 41.

B. euphœsalis Walk., Pyr. 1008.

? B. subjectalis Led., taf. 10, fig. 13.

Montreal (Cooper); New York. I have identified this species as *illibalis* of Hübner (Can. Ent. 9, 28), but perhaps incorrectly. Lederer seems to distinguish the two species from specimens. Hübner's figures do not agree with this species in showing no median clouding on the fore wings above.

55. *Botis perrubralis* Pack., Ann. N. Y. Lyc. 264, 1873.

California (Packard). I have examined Dr. Packard's type of this very distinct species.

56. *Botis semirubralis* Pack., *l. c.* 263.

California (Hy. Edwards, No. 707). I have examined a number of specimens of this distinct form.

57. *Botis plectilis* G. & R., *l. c.* pl. 2, fig. 17.

Maine; New York; Pennsylvania.

58. *Botis adipaloides* G. & R., *l. c.* pl. 2, fig. 19.

Massachusetts (Prof. E. S. Morse). One specimen. I have a second from New York, which has the usually yellow parts of the wing white. It may be a different species.

From Texas I have 1 female (Belfrage, No. 381) and 2 males (Belfrage, No. 380), which are what Zeller describes under this name; they may be a distinct species. At this moment, I have not a series of our Northern form to compare them with.

59. *Botis talis* Grote.

♂. Form of *adipaloides*. Fore wings bright purple. An irregularly shaped, brown-margined, light yellow patch resting on internal margin within the middle, and projected upward on the cell; preceded on the cell by a small, partially confluent, similar spot. A quadrate patch over the veins beyond the cell open to costa, along which the yellow color spreads toward the base. Hind wings bright purple, with a very broad, yellow, central fascia, tapering inferiorly, edged with brown or black lines. Fringes pale. Beneath paler, but as above; base of hind wings entirely yellowish. Thorax brownish-purple; beneath, body and legs whitish. Expanse, 20 mil. Alabama (Grote). So brightly colored and distinctly marked that it can be mistaken for no other species. The fine dark lines edging the yellow patches on fore wings above may be taken for the ordinary lines and the annuli of the purple stigmata.

60. *Botis plumbicostalis* Grote, Can. Ent. 3, 103.

Bright yellow costal region of primaries broadly dark plumbeous or purple-brown from base to tip. Terminal space outwardly filled with the same shade tapering to internal angle. This terminal dark shade is outwardly rounded along its inner margin, and this is widely and everywhere nearly equidistant from the external transverse line; at the internal angle, there is a slight projection corresponding with the inward inferior inflection of the external line. The orbicular spot is small, solid, and absorbed above by the dark costal region, as is the reniform; the latter is small, constricted, with a dark annulus, and very narrow, pale center; both spots concolorous with the dark costal region. There is a short, dark, inner transverse line. The only other, the exter-

nal, runs slightly *inwardly* below costa, then outwardly over the m. nervules, where it is slightly interspaceally dentate; thus, in its upper half it is sinuate or somewhat S-shaped. At 4th m. nervule it runs, as ususal, inwardly, thence transversely to internal margin. The fringes are dark, concolorous with the terminal shade. A single line crosses the secondaries, projects over the disk, and corresponds to the external line of the primaries. A distinct discal spot. Apical angle shaded with plumbeous; fringes pale. Beneath whitish, iridescent, markings of the upper surface faintly reflected. Legs white; anterior and middle femora marked with black. Palpal tips, front and vertex, and sides of thorax in front, dark. Thorax clear yellow. Abdomen above yellowish, with a dark dorsal shade; beneath, the body parts are white. Hind legs entirely white, with two pair of unequal spurs. Expanse, 30 mil. August. Type in Museum Peabody Academy of Science, Salem, Mass.

Recalls the figures of *Eulepte concordalis* of Hübner. The fringes on primaries are not checkered, however, and there are other differences; besides, the present is a stouter form. A specimen of this species has been sent me by Mr. Schwarz, taken at Enterprise, Fla., on June 22.

61. *Botis anticostalis* Grote, Can. Ent. 3, 104.

Bright yellow, with deeper ocherous tinges. The species has the markings and appearance of *Botis plumbicostalis*. Costa of primaries broadly plumbeous, but shading to yellowish toward the tips. Ordinary spots larger, annulate, freer from the costal shade; their centers are whitish-iridescent; the ♂ has no orbicular; in its place, the tegument is somewhat pellucid and impressed. The two transverse lines are fainter and wider apart, the transverse exterior differently shaped. This is *outwardly* rounded at costa, where it is twice interspaceally lunulate, and there is always here a narrow space between it and the terminal dark shade. This latter fills in the entire terminal space superiorly (except as above mentioned) between the external line and the margin, but is obsolete inferiorly below 3d m. nervule, appearing as a spot at internal angle. Secondaries with a distinct discal spot and single, flexed, transverse line. Apices with the commencement of a dark terminal shade. Fringes on both wings pale. ♂ abdomen pointed at the tip, elongate, with dark dorsal shade; ♀ yellow above. Thorax yellow; head, palpal tips, sides of thorax before insertion of wings, dark, as in *B. plumbicostalis*. Legs whitish; anterior and middle pair shaded with blackish. Expanse, 25 mil. July, August. Types in Museum Peabody Academy of Science, Salem, Mass.

Smaller than *B. plumbicostalis*, but greatly resembling it at first sight. On a comparison, the differences above detailed are quite apparent.

This species may belong to *Crocidophora*. I have not seen the male since I described the species in 1871. My types were sent to the Peabody Museum, but they have not been well cared for. The type of the preceding species has been badly eaten by larvæ, and of the present I have been only able to see the female.

62. *Botis syringicola* Pack., Mass. Rep. 18, 1870.

"The moth, for which I would propose the name *Botys syringicola*, is peppery gray with bright yellow markings, while the under side of the wings is pale yellow. The head and body are pale gray, with a yellowish tinge, white on the under side of the body and under side of the palpi. The antennæ are pale gray, like the body. The fore wings are gray, due to black scales lying on a pale straw-yellow ground. On the inner fourth of the wing are two yellow spots, one just above, and the other just below, the median vein. In the middle of the wing, just below the costa, is a prominent square, bright straw-yellow spot; on the outer fourth of the wing is a slightly curved yellow band, with three scallops on the outer edge, and extending to a large yellow patch in the middle of the wing, which is tridentate on the outer edge, it is bordered beyond with a black, zigzag line, and a fine, stout, yellowish line beyond. A dusky streak extends from the apex to the costal yellow band. There are two broken dusky lines at the base of the fringe on both wings. The hind wings are yellow, with four sharply zigzag dark gray lines. The under side of the fore wings is paler than above, with a yellowish tinge. The hind wings are pale yellow, with a single, much curved line on the outer third of the wing; and there are two dots near the middle of the wing and a row of blackish dots at the base of the fringe. It expands one inch."

I have not been able to identify this species or see the type.

63. *Botis subolivalis* Pack., Ann. L. N. H. 261, 1873.

Botis hircinalis Grote, Bull. B. S. N. S. ii, 232.

I have examined a number of specimens of this species from Maine and New York. The males do not show the pale sinuate external fascia on primaries above, and the hind wings are not rayed as in the female. All the specimens I have seen from the East have the secondaries above dark and immaculate. This is closely allied to the European *opacalis*.

64. *Botis unifascialis* Pack., *l. c.* 261.

This Californian species differs by having the hind wings above shaded with whitish—in one male almost entirely pale. Beneath, they are paler than in *subolivalis*, and altogether the Californian species so approaches in this and other respects to the European form that it may not be possible to separate them. But one Californian ♀ (Hy. Edwards, No. 207) has the secondaries above entirely blackish, and, except that they are paler beneath, just like my Eastern specimens. It seems to me that these two forms may be united under one specific name. The males have more pointed and apparently longer wings than the females.

65. *Botis niveicilialis* Grote, Bull. B. S. N. S. ii, 232.

New York. This is a very distinct form, with blackish wings and snow-white fringes. It may not be properly placed here. But the

entire present arrangement of our species of *Botis* is not insisted upon, and is quite provisional in its character.

66. *Botis stenopteralis* Grote, Can. Ent. x, 26.

I have received this species from Canada (from Mr. Caulfield) and Maine (Professor Fernald). An exceedingly distinct and narrow-winged form, distantly recalling the European *ablutalis*, from which it differs by the darker color, stouter body, narrow, even, exterior line, and black discal mark on primaries above. Fore wings very dark brown, median space sometimes shaded with gray; discal mark black, outer line white, even, slightly rounded. Hind wings with black terminal space, with yellowish and fuscous basal shades and a mesial yellowish or white incomplete band continuous with exterior line on primaries. Wings beneath pale reddish-ochery or whitish with common line and discal marks; external line of both pair fuscous. Palpi black at the sides, whitish beneath. Abdomen blackish above, annulate with white; beneath whitish. Expanse, 18 mil.

EURYCREON *Led.*

1. *Eurycreon chortalis* Grote, Bull. B. S. N. S. 1, 89, pl. 5, fig. 13.

New York; Massachusetts; Oregon (No. 5255, Hy. Edw.); Soda Springs (Behrens).

2. *Eurycreon sticticalis* (Linn.).

Illinois (Dr. Nason). This species is European. Also found in Colorado (Hayden).

3. *Eurycreon cereralis* Zell., Beitr. 1, 517.

New York; Illinois; Denver (Hayden).

4. *Eurycreon anartalis* Grote, Can. Ent. 10, 27.

California (Behrens).

5. *Eurycreon rantalis* (Guen.).

Scopula occidentalis Pack., *l. c.*

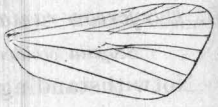
Notwithstanding the slight difference in size, the Californian specimens seem to belong to the same species with the Texan, as indicated by Zeller. Two specimens are shaded with pale ocherous, and this circumstance draws against the validity of *communis* as distinct. Lederer's figure of *crinitalis* does not quite agree with *communis*, the line being dentate, but Zeller's *crinitalis* is undoubtedly *communis*. I have a specimen which is leather-brown! I think that *rantalis* and *occidentalis* refer to fuscous forms, and *crinitalis* and *communis* to ocher forms of the same ugly and variable species. Remembering the analogy in *ventralis* and *fracturalis*, such a variation cannot be considered extraordinary. I did not recognize in Lederer's somewhat enlarged figure of *crinitalis*

my *communis*, because the line is *dentate*, as in Lederer's figure of *rantalis*. The clypeus is mucronate. The inner line is also apparent in *communis*, wanting in Lederer's figure of *crinitalis*, and thus there is a little doubt whether *crinitalis* and *communis* are the same; but Lederer's doubt that *crinitalis* and *rantalis* were distinct goes to suggest that his *crinitalis* is an extreme variety of the usual ocher form of *rantalis*, and which I have described as *communis*. If these suggestions prove correct, the species will have a wide range; from California to Texas, Alabama, and to Buenos Ayres in South America. It is perhaps one of our most unsightly moths. Although I did not regard them as typical, I described certain yellowish-fuscous specimens, which I would now consider to belong to *rantalis*, as a variety of *communis*.

EPIPASCHIÆ.

Ocelli present. Male antennæ with a basal scaled tegumentary process thrown backward over the thorax; female antennæ simple; clypeus flattened; male maxillary palpi tufted (*Cacozelia*, *Toripalpus*, *Tetralopha*) or scaled (*Epipaschia*, *Mochlocera*). Tongue scaled at base; labial palpi as long as or exceeding the front, with small, pointed, scaled, terminal joint. Fore wings with straight or depressed, in the males of *Tetralopha* somewhat convex, costal margin, pronounced apices, widening outwardly, subtriangulate; 12-veined, or 11-veined (*Tetralopha*), vein 1 simple (*Mochlocera*, *Toripalpus*, *Tetralopha*), or more or less distinctly furcate at base (*Epipaschia*, *Cacozelia*); vein 5 near 4 at base; 8 out of 7 to external margin just below apices; 9 out of 8 and both to costa just before apices; cell incompletely closed. Hind wings 8-veined, three internal veins counted as 1; 4 and 5 near together at base; 8 free; cell incompletely closed except in *Toripalpus*. Female frenulum divided; that of the male simple.

This group is characterized by the flattened clypeus and the tegumentary scaled process attached to the base of the antennæ in the male, and thrown backward over the thorax. It presents some features of Heineman's *Galeriæ*, but vein 1 is not uniformly furcate at base of primaries, and the third joint of the male labial palpi is not naked and excavate. The ocelli are also present. It is probable that *Deuterollyta conspicualis* of Lederer, from Brazil, belongs to this group.



EPIPASCHIA *Clemens.*

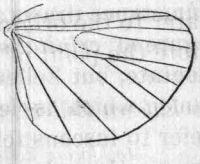


Fig. 1.

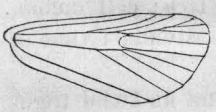
Male antennæ with a basal tegumentary scaled process as long as the thorax; ciliate beneath; scaled above; the joints of the antennæ are well defined. Male maxillary palpi scaled. Labial palpi as long as the front, curved upward, with moderate, pointed, scaled, third article not well defined from second. Fore wings with evin 5 joined to 4 by a very short cross-vein; 8 out of 7 about a fourth

from the origin of 6; 9 out of 8 a very short furcation; 1 more or less distinctly furcate at base; 5 prolonged inward beyond the point where the closure of the cell is indicated above and below. Hind wings with vein 5 joined to 4 by a very short cross-vein; cell open.

Epipaschia superatalis, fig. 1 (neuration).

Epipaschia superatalis Clemens, Proc. Ac. Nat. Sci. Phil. 14, 1860.
Deuterollyta borealis Grote, Bull. Buff. Soc. Nat. Sci. 1, 177.

♂ ♀. Fore wings dusty yellowish-gray with powdery black lines. Inner middle line marked on costa by a black dot; below it is obsolete, or partially indicated. A black discal dot near the costal spot of the inner line. Outer line irregularly denticulate, better marked superiorly, where it runs obliquely outward to median nervules, produced about vein 4, thence running inwardly below vein 3, whence it descends, very slightly outwardly projected, to internal margin. Terminal field wide; a diffuse, broad, brownish or blackish shade-band marking the veins. A terminal series of distinct interspaceal black marks becoming continuous inferiorly. Fringes pale, interrupted with brown and with a dotted line. Hind wings fuscous, the veins darker-marked; a discal dot very near the base and costal border; a terminal distinct line; fringes pale, with a dotted brown line. Beneath yellowish-gray, sometimes suffused with blackish; a common line and discal dots; the terminal shade on fore wings less prominent than above, and here also continued on secondaries. Several specimens examined from Oldtown, Me., Mr. Charles Fish; also one male from Kansas, Prof. Snow, and one female, Long Island, N. Y., July 6. The type of *borealis* was from Cambridge, Mass., Mr. J. C. Merrill. Dr. Clemens's type was from Farmington, Conn., Mr. Edw. Norton. The average expanse of my specimens is about 22 mil.



MOCHLOCERA *Zeller*.

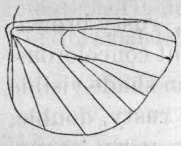


Fig 2.

Male antennal process as long as the thorax, or nearly so. Male maxillary palpi scaled. Labial palpi a little exceeding the front, curved upward, with the third joint shorter and more distinct than in *Epipaschia*. Neuration of *Epipaschia*, but on primaries vein 1 is simple at base; vein 5 is not inwardly prolonged, and vein 8 is thrown off at about one-third from the origin of 6, a little nearer to the origin of 9, which latter is longer, being here thrown off before the point of its origin in *Epipaschia*.

Mochlocera Zelleri, fig. 2 (neuration).

Mochlocera Zelleri Grote, Can. Ent. 8, 157.

♂ ♀. Fore wings divided into three fields by the median lines.

Inner line defining outwardly the blackish basal space. The line itself is black, with a slight median notch, nearly perpendicular. Median space washed anteriorly with white. A short, black, discal streak. Outer black line very finely denticulate, shaped much as in *superatalis*, but not produced so much on median nervules. It arises at about apical third, at first outwardly oblique, then running inwardly below median vein and narrowing the median space thence to internal margin. Terminally the wing is again black or blackish. A broken black line at the margin. Fringes on both wings dark, pale at base, with broken blackish interline. Beneath blackish, with common shade-band and black discal point on hind wings.

Expanse, 25 mil. Texas, No. 420, collected by Belfrage, April 30. Missouri, collected by Mr. Riley, who informs me the larva lives on *Toxicodendron*.

CACOZELIA *Grote*.

Male antennæ with the tegumentary process a little exceeding the prothorax. Labial palpi curved upward, exceeding the front a little, concealing in the male the brush-like maxillary palpi, which are much as in *Pempelia*. In the female, the long brush is wanting. The third article of the labial palpi is scaled, pointed, rather short. Fore wings much like *Mochlocera* in the position of 7, 8, and 9, but the cell is nearly closed, and vein 1 is distinctly furcate at base, while veins 4 and 5 intersect. On the hind wings the cell is almost entirely closed, and veins 4 and 5 intersect.

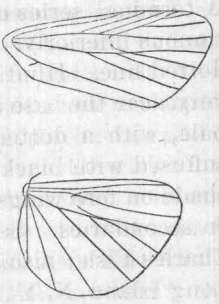


Fig. 3.

Cacozelia basiochrealis, fig. 3 (neuration).

Cacozelia basiochrealis Grote, Proc. Bost. Soc. Nat. Hist. 264, 1877.

♂ ♀ . Rusty-ocherous. Interior line double, arcuate, rusty-brown; basal space ochery. A costal dark dot surmounting a faint concolorous-ringed discal mark; median field light stone-gray; median shade visible as a patch of dark, slightly raised scales. Posterior line rusty, double, inclosing a whitish shade, most distinct on costa, of the usual shape. Subterminally the wing is brown, washed with gray on external margin. A fine, terminal, dark line on both wings. Hind wings yellowish-gray, with a fine, denticulate, exterior line. Beneath ocherous; costa at base brown. Head and appendages ocherous; beneath, the fore and middle tibiæ are purplish; hind legs dotted with brown.

Expanse, 18 mil. Two specimens, No. 618, July 17, collected in Texas by Belfrage.

In the colors of primaries, this species recalls *Chalcoela aurifera*, or *Chalcoela Robinsonii*.

TORIPALPUS *Grote.*

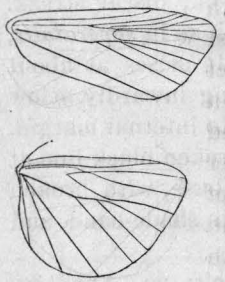


Fig. 4.

Male antennæ with a short, tegumentary, scaled, basal process not exceeding the collar; the antennæ are lengthily ciliate beneath. Labial palpi much exceeding the front, the second article elongate, inwardly hollowed out, apparently to receive the maxillary palpi, which are bi-tufted, as in *Tetralopha*. Third article of labial palpi short. Fore wings with vein 1 simple, the cell almost closed, 5 from the cross-vein close to 4, 8 out of 7 at more than one-third from the origin of 6; 9 out of 8, a rather long furcation. Hind wings with the cell closed; 4 and 5 joined; 5, a continuation of the discal vein; 6 and 7 from one point; 8 free.

Toripalpus breviornatalis, fig. 4 (neuration).

Toripalpus breviornatalis Grote, Proc. B. S. N. H. 265, 1877.

♂. Two specimens: one, the type, perfectly fresh, collected by Belfrage in Texas (No. 421), April 5, the other, larger, from Colorado, sent me by Dr. Bailey, in broken condition, belong to this species, characterized by the antennal appendages being extremely short, hardly exceeding the collar. The labial palpi are longer, and the antennæ are much more lengthily ciliate compared with *Mochlocera*. The ornamentation, but not the color, is like *Zelleri*. Fore wings reddish-brown at base to the inner line, which is dark brown, preceded by a dark shade with raised scales, slightly outwardly produced on costa and submedially. Inner portion of median space washed with white on costal region and anteriorly. A discal dot. The outer line is dark brown, denticulate, produced over median nervules, whence it runs obliquely inwardly to internal margin. It is followed by a whitish corresponding shade-line. Terminal space washed with brown, becoming whitish before the margin. The outer line is situated much nearer the outer margin than in *Zelleri*. A terminal dotted line distinct on hind wings. These latter are pale fuscous, with an outer dentate line followed by a white shade more or less noticeable. Terminal palpal joint marked with black, tipped with pale. Head and appendages reddish-brown; thorax becoming pale behind. Beneath, the wings are reddish-brown, becoming paler inferiorly. A common exterior line near the margin, and corresponding with the exterior lines on upper surface in shape. Fringes pale, obsoletely interlined. On hind wings beneath, a discal point. The Texan specimen expands 24 mil. The male from Colorado nearly 30 mil.

TETRALOPHA *Zeller* (1848).

Ocelli present. Labial palpi exceeding the front; in the male, the second joint is elongated, and furnished with a sheath-like depression

on the inside, in which the bi-tufted maxillary palpi are concealed. Male antennæ with a short, scaled, basal process. Fore wings 11-veined; in the male, there is a costal fold beneath at base, furnished with a fringe of transverse scales; the subcostal nervules are crowded, so that their exact disposition is a matter of uncertainty. There is a vitreous spot toward the base of the cell, just beyond the interior line. The cell is open, and narrower than in the female. The female wing is destitute of the vitreous spot, the fold, and fringe. Veins 4 and 5 intersect, and the cell is partially closed from both sides. Veins 8 out of 7, 9 out of 8. Hind wings 8-veined; 8 out of 7; 4 and 5 joined on one stem; cell closed. The fore wings are broad, with rounded or convex costæ in both sexes.

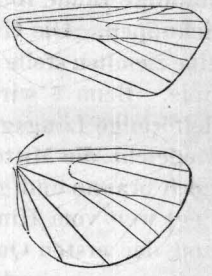


Fig. 5. ♀

Dr. Clemens describes the *third* palpal joint as being very long, and concealing the maxillary tufts. But I see that it is plainly the *second* in a new Texan species, of which I here illustrate the venation of the female wings. In *platanella* and *asperatella*, the *third* joint of the labial palpi is difficult to make out; but I believe it more likely to be small, as is usual, than that the males of these two species should make an exception to the general palpal structure in the family. In both males and females of *asperatella*, I believe to make out the third joint distinctly; it seems longer in the latter.

Professor Zeller describes three species, *militella*, Isis, 1848, p. 880, *robustella*, Isis, p. 881, and *melanogrammos*, Verh. Zool.-Bot. Ver. p. 546, tab. iii, fig. 24 *a*, *b*, 1872.

Dr. Clemens redescribes the genus under the name of *Lanthaphe*, and states erroneously that it appears to be congeneric with *Acrobasis* of Zeller. The genus is very close to *Toripalpus*, but clearly distinguished by the 11-veined primaries and the shape and fold of the male wings.

Tetralopha militella Zeller, Isis, 1848, p. 880.

"Rückenschild und Kopf graugelblich, Schulterdecken und Kragen an der Basis dunkler. Der hintere, übergelegte Schopf ist röthlich-gelb und hat fast Augenlänge. Fühler ziemlich lang, an dem doppelt gefranzten Theil etwas dicker, auf dem Rücken bleichgelb und bräunlich schwach geringelt. Die Gesichtsschuppen liegen locker auf. Die reichhaarigen Pinsel der Maxillar-Taster sind schwarz-bräunlich, der Stiel weisslich. Lippentaster gelblich-grau. Beim ♀ ist das Endglied $\frac{2}{3}$ so lang als das zweite Glied, dünn und feinspitzig. Beine hellgrau, an der Mittel- und Hinterschiene auf dem Rücken nahe der Basis mit einem schwachen Haarbüschchen. Hinterleib bleichgelb, an den Segmentwurzeln hellbraun.—Vorderflügel ♂, 3‴, ♀ 5‴ lang, nach hinten beträchtlich erweitert, mit sehr convexem Vorderrande, schwach convexem Hinterrande und deutlichem Vorderwinkel; röthlichgrau, am Anfang des

Mittelfeldes mehr weisslich-grau. Das verdunkelte, beim ♀ mehr braune Wurzelfeld hat in einiger Entfernung von der Wurzel eine fast vollständige Binde röthlich-brauner, an den Enden brauner, aufgerichteter Schuppen. Die Grenze des Wurzelfeldes bildet vor der Flügelhälfte eine ziemlich steile und fast grade, braune, weiss-grau ausgefüllte Doppellinie. Beim ♂ wird sie nahe am Vorderrande durch eine schmale spindelförmige Längsgrube durchbrochen, die nahe der Basis anfängt und vielleicht die Mittelzelle vorstellt, über und unter ihrem Ende liegen noch braune und graue aufgerichtete Schuppen. Die zweite Querlinie liegt weit vom Hinterrande entfernt, fast in der Mitte zwischen diesem und der ersten Querlinie; sie ist verloschen, grau, gebogen, schwachwellig, am oberen Drittel mit einer kurzen, nach aussen gerichteten Ecke; sie ist einwärts von einer braunen Schattenlinie eingefasst; zwischen ihr und der schwarz punktirten Hinterrand-Linie ist die Farbe hellröthlichbraun, schattig. Franzen heller.

"Die abgerundeten Hinterflügel sind grau-bräunlich, hell gefranzt. Medianader mit den Verhältnissen 3:1—1:3.—Unterseite gelbbräunlichgrau, hell, beim ♂ in einem langen, breiten Streifen am Vorderrande von der Wurzel aus mit langen, quergehenden hellen Schuppen dicht bekleidet."

I have a single male specimen from New York agreeing with this description.

Tetralopha robustella Zeller, Isis, 1848, p. 881.

"Der vorigen etwas ähnlich, mit gestreckteren Vorderflügeln, brauneren und durch keine Doppellinie beendigtem Wurzelfelde. Grösse über der von Militella. Rückenschild, Beine und Kopftheile bräunlich-grau, dunkler bestäubt. Hinterleib hell mit dunklerer Basis der Segmente und solchem Afterbusch. Vorderflügel 5½‴ lang, erheblich gestreckter als bei Militella, mit weniger convexem Vorderrande. Wurzelfeld dunkelbraun, an der Basis heller; hinter seiner Mitte zwischen Subdorsal- und Subcostalader mit zwei schräg über einander stehenden Schuppenhöckern; es endigt vor der Flügelmitte scharf in einer sehr schwach gekrümmten, gegen aussen concaven Linie, welche durch den daran stossenden weissgrauen Grund des Mittelfeldes sehr gehoben wird. Am Vorderrande tritt die braune Farbe etwas über diese Linie hinaus und endigt an einem weissgrauen Schuppenhöcker, der einen braunen Punkt hat. Unterhalb desselben mehr nach hinten in geröthetem Grunde steht ein anderer Höcker, an den sich oberwärts kleinere in einer gegen den Vorderrand gerichteten Reihe anschliessen. Hinter ihr ist der ganze Grund bis zum Hinterrand hellbraun; die zweite Querlinie bildet einen grösseren Winkel als bei Militella und wird einwärts von einer schärferen dunkelbraunen Schattenlinie gerandet als auswärts; sie ist dem Hinterrande näher als bei der genannten Art. Hinterrands-Linie schwarzbraun, durch die Adern unterbrochen. Franzen bräunlich-grau.

"Hinterflügel hell gelbgrau, grau franzig. Unterseite aller Flügel braungrau mit dunklerer Randlinie."

Tetralopha platanella.

Lanthaphe platanella Clem., Proc. Ac. N. S. Phil. 207, 1862.

"Labial palpi pale brownish-red, touched in front with pale gray. Head and thorax brownish-red, the latter varied with grayish and dark fuscous. Fore wings grayish-fuscous, with the costa touched with brownish-red, and a patch of the same hue in the female, near the base of the inner margin containing a tuft of raised scales; in the male, blackish-brown, touched with brownish-red. The base of the wing is whitish. In the middle of the wing is a broad white band, obsolete toward the costa, with two straight blackish-brown lines internally, and in the male shaded internally with the same hue. The subterminal line is irregular and whitish, dark-margined internally. The hinder margin of the wing is touched with blackish-brown. Hind wings pale brown, somewhat darker toward the hinder margin. The larva is tortriciform in appearance. Head pale brown, mottled with whitish. Body with isolated hairs, pale green, with a dark brown dorsal line and a fainter stigmatal line of the same hue, or pale reddish, with a brown dorsal line on each side of the vascular. It makes a web on the under surface of the leaf of Sycamore (*Platanus occidentalis*), drawing it together and living within a silken tube. The cocoon is woven on the surface of the ground, in form of a flattened oval, consisting of brown silk covered exteriorly with grains of earth. The larvæ remain in it unchanged during the winter. It may be taken in July, and enters the pupa state during the latter part of August, to appear as an imago in May or June."

This species is probably equivalent to *melitella* of Zeller.

Tetralopha asperatella.

Lanthaphe asperatella Clem., Proc. Acad. Nat. Sci. Phila. 207, 1860.

"Labial palpi blackish-brown, varied with whitish. Thorax pale grayish, varied with grayish or dark gray. Fore wings dark brownish-gray, with a blackish-brown tuft of scales in the basal part of the fold, and a smaller one of the same hue on the disk above it, a whitish median band, sometimes almost obsolete, containing on the disk a small blackish-brown tuft in the female, with an internal crenated blackish line, and shaded toward the base with blackish; on its external margin is a line of raised scales. The subterminal line is pale grayish, angulated and margined internally by a blackish line, and externally by a fainter one produced into points on the nervules. The hinder marginal line is black. Sometimes in the female base of the wing is whitish, slightly touched with luteous."

I have five specimens—two males and three females—before me. The smallest measures 23 mil., the largest 28. They vary in the amount of grayish-white on the median space of fore wings above.

The localities are Texas, Long Island (N. Y.), Montreal, Massachusetts. It is uncertain that they belong here.

In addition, Belfrage has collected in Bosque County, Texas, a number of specimens which agree closely in ornamentation, but are separable into distinct forms by their differing size. Under the circumstance that I am yet without positive identification of certain described species, these forms should not be described at the present writing.

In my opinion, the variability of the species of this genus will be found so great as to prevent accurate determinations until very large material is accumulated.

PHYCIDÆ.

Ocelli sometimes wanting. Male antennæ often with a peculiar structure of the basal portion. This is sometimes bent, with a scale-tuft (*Nephopteryx*, *Pempelia*) or without a scale-tuft (*Anerastia*), or, again, slightly bent, somewhat rigidly held, with a succession of small overlapping scale-tufts (*Pinipestis*); again, there is a basal constriction (*Homeosoma*); again, these peculiarities are wanting (*Ephestia*). The maxillary palpi in the male are sometimes furnished with a concealed pencil of hair (*Pempelia*, *Salebria*); again, they are small, scaled, and similar in the sexes (*Nephopteryx*, etc.); again, they are wanting. Tongue scaled at base. Labial palpi similar in both sexes, scaled, ascending. Fore wings usually narrow; hind wings broad, exceeded by the slender abdomen. The clypeus is full, rounded. Eyes naked. Fore wings 11-, 10-, or 9-veined; vein 1 not furcate; 8 out of 7 (*Nephopteryx*, etc.), or these two veins fall together (*Homeosoma*). Generic characters are offered by the differing position of 4 and 5, which have sometimes separate origin, and again are furcate. The hind wings are 8-, 7-, or 6-veined, the three internal veins counting as one. Generic characters are offered by the differing position of veins 4 and 5, veins 7 and 8, and the point of origin of vein 2. The female frenulum seems to be simple. I do not find this character mentioned by authors, and it may not prove invariable.

The larvæ live in fruit, under bark, or in cases on the leaves. Many pupate on or in the ground; others, like *Pinipestis*, in the thickened sap or under the bark of the tree. Among this group are some of the most dangerous foes to timber. In Europe, the pines are attacked by *Dioryctria abietella* and *splendidella;* in the United States, the ravages of *Pinipestis zimmermani* on the same genus of trees have been noticed in many places, and I have accounts of what I suppose to be injuries inflicted to pineries by *P.? abietivorella* from two or three correspondents in New England.

ACROBASIS *Zeller.*

The male antennæ have a pointed scale-tuft on the basal joint. In *rubrifasciella*, the male antennæ are bent above the tuft, ciliate beneath. Maxillary palpi small; labial palpi pointed, curved upward. Fore wings

with 11 veins; 4 and 5 from one point; hind wings with 8 veins; the cross vein nearly complete; 4 and 5 together at the extremity of submedian vein; 8 running close to 7, but free.

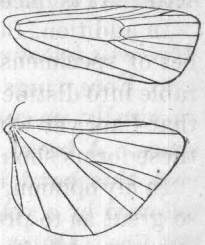


Fig. 6.

Acrobasis rubrifasciella, fig. 6 (neuration).

Acrobasis rubrifasciella Pack., Ann. Lyc. N. Hist. 267, 1873.

♂ ♀. Shining brownish-fuscous, shaded with gray at base on costal region over the superposed dark discal points obliquely downward over median space anteriorly. A ridge of dark, raised scales precedes a blood-red band before the dark, somewhat arcuate, anterior line. Posterior line dark, followed by a faint whitish shade inwardly oblique and straight to median fold, running outwardly, and denticulate over m. nervules. Hind wings dark fuscous. Head and thorax brownish-fuscous. Beneath paler fuscous, without markings. Average expansion 21 mil.

I have examined between fifty and sixty specimens from Maine and Massachusetts, which vary but little; the red band is apt to become faint, especially in worn individuals, but I can always detect it. Some have the tegulæ reddish. The species distantly resembles the European *advenella*.

"In one additional specimen from Maine, the fore wing has scattered reddish scales at base and beyond the middle, while the dark transverse stripe is wanting, and the red portion forms a broad, transverse, bright red band. The larva lives in June and early in July between the leaves of the alder, where it makes a horn-shaped case of black cylindrical pellets of excrements, arranged regularly in circles, the additions being made around the mouth of the case. The case is about an inch and a half long; its mouth a quarter of an inch in diameter. Within, it is densely lined with white silk. The pupa is of the usual color, mahogany-brown, the end of the abdomen rounded, with six hairs projecting from a transverse supraanal projecting ridge. On each abdominal segment is a dorsal, dusky, transverse stripe, widest on the basal segment. The Museum of the Peabody Academy of Science also contains ten specimens of this moth reared by Mr. T. H. Emerton. The larvæ were found feeding on the Sweet Fern (*Comptonia asplenifolia* Ait.), July 7, 1866, at Hamilton, Mass., the moth appearing July 20. The case is quite different in form from that previously described, being regularly oval cylindrical; .55 inch long and .35 inch in diameter. It is constructed in the same manner as those found on the alder. This striking difference in the form of the case may possibly be due to the difference in the form of the leaves of the food-plant, the large broad leaves of the alder inducing the larva to build a horn-like, much elongated case; while the narrow smaller leaves of the Sweet Fern may have led to the formation of a short oval case. The differences are such as we would

ordinarily regard as specific, but neither do the pupæ or adults reared from the two plants differ appreciably."—*Packard, l. c.*

Acrobasis tricolorella, n. s.

♂. Fore wings blackish, shaded with whitish-gray on terminal space outwardly, on costal region, over the fused discal points, and on basal space. A broad white band before the anterior line. Below median vein, this band is edged outwardly by a dusky shade-line, and this is followed by a yellow-red shade before the outwardly oblique black anterior line. Outer line followed by a whitish shade, roundedly indented below costa, followed by the blackish ground-color in terminal space, and this by the whitish-gray terminal shading. A dotted, terminal, black line; fringes pale. Secondaries pale fuscous, with paler fringes. Beneath, fore wings dark; hind wings shining pale fuscous. Expanse, 20 mil. Two male specimens collected by Mr. Charles Fish, Oldtown, Me. I have not been able to examine the neuration, but the antennal structure leaves no doubt of the genus.

The genus *Acrobasis* is treated by Heineman as a subdivision of *Myelois*.

PEMPELIA *Hübn.*

Fore wings 11-veined; 4 and 5 from a short stalk. Hind wings 8-veined; 4 and 5 from a common stalk beyond the extremity of the cell, and appearing as the continuation of the cross-vein. The median vein throws off 2 and 3; the stalk of 4 and 5 runs near 3, but only touches it at a single point, sweeping by it, and becoming the concave cross-vein which on the upper side returns to form a prolongation to vein 6. In *Acrobasis rubrifasciella*, 3, 4, and 5 are exceedingly close at base; the cross-vein vanishes centrally; here it is completely indicated.

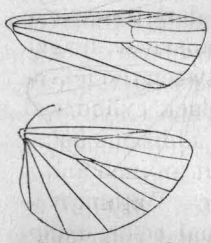


Fig. 8. Neuration of hind wings resembling *Catastia*.

The male antennæ are bent at base with a scale-ridge. The maxillary palpi are concealed by the ascending labial palpi, and terminate in a tuft of testaceous hair. In the female, this tuft is wanting, and the antennæ are simple.

This form differs from *Pempelia* as defined by Heineman by the hind wings being 8-veined, and in that 4 and 5 of the primaries spring from a common stalk; from *Salebria* also by the latter character.

Pempelia pravella, n. s., fig. 8 (neuration).

♂♀. Blackish and gray, resembling *Acrobasis rubrifasciella* in ornamentation. Base of primaries whitish-gray; no raised scales. Anterior line blackish, diffuse, consisting of two outwardly oblique, slightly waved lines, usually coalesced, but allowing sometimes the narrow gray space between them to be seen. Median field gray; two superposed

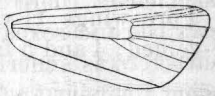
black dots on cell; outer line whitish, finely dentate, with a little deeper submedian notch, margined on both sides by a blackish shade. A row of terminal black dots; fringes gray. Hind wings testaceous-fuscous, rather pale, with pale fringes. Beneath, the hind wings are yellowish; fore wings fuscous, with the exterior line marked. Abdomen testaceous-fuscous; thorax and head dark grayish. Legs gray, marked outwardly with black. Expanse, 19 to 20 mil. Eighteen specimens examined, taken by Mr. Charles Fish, of Oldtown, Me.; also by Professor Fernald at Orono.

This species so nearly resembles *rubrifasciella* at first glance that it might be considered an extreme variety, although strongly generically distinct. It is not so smoothly scaled, and the tone is grayish, not brownish-fuscous.

Salebria *Zeller.*

Fore wings 11-veined, with veins 4 and 5 separate. Hind wings with 8 veins, 2 near the lower angle of the cell. Male antennæ bent at base, with a scale-ridge. Maxillary palpi in the male ending in a pencil of discolorous hair hid behind the labial palpi.

The distinction from *Pempelia* proper consists in the 8-veined secondaries. In the North American specimens here described, vein 5 runs alongside and touching 4 at base; 4 leaving 5 at a point about midway between the cell and external margin.



Salebria fusca, Haw., fig. 7 (neuration).

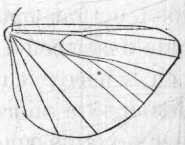


Fig. 7.

♂ ♀. Fore wings blackish-gray, with black discal mark formed of the usual dots united. Inner line white, black-margined on either side, upright, once dentate on vein 1, absorbed superiorly by the black shade-lines. Outer line white, distinct, continuous, black-margined on either side, indented subcostally and again before internal margin, slightly uneven. Head and thorax blackish. Fringes very narrowly interlined on both wings. Hind wings as usual, smoky translucent, with narrow terminal line. Beneath without markings, except on costa of primaries. I have examined 15 females and 4 males from Oldtown, Me., sent me by Mr. Charles Fish, and Orono, by Professor Fernald. Identified by Professor Zeller as the same as the European species.

Nephopteryx *Zeller.*

The male antennæ are bent at base, where they are provided with a scale-ridge. The male maxillary palpi are small, concealed, not provided with a pencil of hair, as in *Pempelia* and *Salebria*. The fore wings are 11-veined; the hind wings 8-veined. In *ovalis*, as herewith figured, and *fenestrella*, veins 4 and 5 have a separate origin on primaries;

the hind wings have 4 and 5 from a common stalk, connected by a short vein with 3, sweeping by and forming the cross-vein.

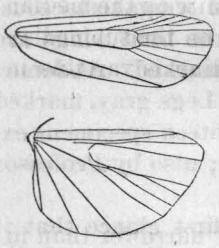


Fig. 9.

Until the structure of our species can be carefully compared with the European, it will be better to refer to this genus all forms which combine the peculiarity of the male antennæ here described with untufted male maxillary palpi, and 11-veined primaries, on which 4 and 5 have a separate origin, and 8-veined secondaries. There is no doubt that Dr. Packard has incorrectly used the term "*Pempelia*" throughout, and probably also the present generic term. His *Nephopteryx roseatella* does not belong here. Dr. Packard's generic determination of the female of *ovalis* carries no weight; for, in this genus and its allies, the female does not possess the essential characteristics.

Nephopteryx ovalis.

♂ *Pempelia ovalis* Pack., Ann. Lyc. N. Hist. 269, 1873.
♀ *Nephopteryx latifasciatella* Pack., *l. c.*

♂ ♀. I have Dr. Packard's types before me and forty or fifty additional specimens. There is not a particle of doubt that Dr. Packard has described the sexes under distinct genera, and thus taken the sexual characters as generic, although the male has no characters of *Pempelia* except the bent and tufted antennæ. The two specimens, and descriptions for that matter, are otherwise almost exactly the same. The female described by Dr. Packard wants the ochery submedian streak, which, where it cuts the dark band before the anterior line, usually expands into a more or less well-marked spot. In some specimens of either sex, this ocherous mark is almost wanting. My material has been mostly sent me from Maine by Mr. Fish and Professor Fernald.

"Palpi large and broad, antennæ tufted at base as usual, fore wings oblong, not very long, outer edge less oblique than usual. Body and fore wings ash, being covered with whitish and brown scales. Fore wings with a short, curved, dark line at base on the median vein. On inner third of wing a very broad brown band, directed obliquely outward from the costa to the inner edge, and enclosing a large distinct, regularly oval (longitudinal), ochreous spot between the median and submedian veins. Two obscure black discal points situated as usual; the outer one is enclosed in a dusky shade crossing the wing obliquely and limited beyond by the usual submarginal zigzag line, this line is curved inward below the costa; from the middle of the wing to the inner margin it is exactly parallel to the outer edge, terminating in an angle directed outwards. Between this line and the edge is a series of dusky bars, the interspaces cinereous. A marginal black line. Fringe cinereous. Hind wings pale smoky. Beneath fore wings dusky. A whitish costal spot near the apex, but no line. Hind wings slightly paler. Ab-

domen concolorous with the hind wings. Legs dull ash, ringed with whitish."—*Packard, l. c.*

The submedian and median veins are flecked with white on the median space in the darker specimens. The ovate ocher spot on the submedian fold in the fuscous shade-band before the anterior line is variable in distinctness.

Nephopteryx fenestrella.

Pempelia fenestrella Pack., Ann. N. Y. Lyc. 259, 1873.

"In this species the fore wings are long and rather narrower than in the European *P. palumbella*, and the large broad palpi, though of much the same form, are porrected instead of ascending; but in venation and the structure of the antennæ it agrees with the European species, and *Pempelia ovalis* from New England, in which the wings are much shorter. Body and wings cinereous or granite-gray, the abdomen and legs being paler, and concolorous with the legs and hind wings, which are of the usual glistening hue of the genus. Fore wings of the same ash hue as the thorax, speckled with black scales. Two black dots at the base of the wing below the median vein. Beyond on the submedian vein is a longitudinal, blackish, inconspicuous stripe edged on each with dull ochreous. Above it is a dark point on the median and subcostal veins, with whitish scales surrounding the middle dot, but there are no raised scales on the wing. Just beyond the middle of the wing are two, prominent, squarish, black spots, one on the median, the other on the subcostal vein. A distinct, white, submarginal line, parallel with the outer edge and bordered internally with black scales, especially marked on the costa. The space between this line and the outer edge is filled in with deep, ochreous, longitudinal bars, alternating with black streaks, of which the costal one is the widest and shortest. These bars do not quite reach the distinct, black line at the edge. Fringe ash, twice lineated with whitish. Beneath a pale, whitish, straight, submarginal line, edged within towards the costa with dark ash.

"Length of body ♂, .45, ♀, .45 of an inch; fore wing ♂, .43, ♀, .44 of an inch. California (Edwards)."—*Packard, l. c.*

I have examined the type and two additional specimens, and the neuration, which latter should agree with *Pempelia*, as stated by Packard. The difference between *Nephopteryx* and *Pempelia* does not lie in the neuration, but in the structure of the male maxillary palpi.

Nephopteryx leoninella.

Pempelia leoninella Pack., Ann. N. Y. Lyc. 259, 1873.

"Antennæ and palpi as in *P. fenestrella*, but the fore wings are more produced towards the apex, the outer edge being more oblique. Body and base of fore wings tawny, the thorax being clay-yellow; palpi clear

ash. Basal third of fore wings tawny yellow, somewhat orange-colored externally, outer edge of this colored portion directed regularly, obliquely outwards from the costa to the inner edge, with three, black, venular dots along this oblique border. In the ash space beyond is a distinct, dark, discal dot, and the veins are black. A broad, marginal, tawny, yellow band, the sides even and parallel. The costa, however, is cinereous to the apex. A marginal black line, and a fine dark line in the cinereous fringe near the base. Hind wings of the usual hue. Abdomen luteous. Beneath, fore wings smoky, dusky towards the costa; a pale, costal streak, not forming a submarginal pale line as in *P. fenestrella*. Legs dark ashen, whitish at ends of joints.

"Length of body, ♂, .50, ♀, .45 of an inch; of fore wing, ♂, .46, ♀, .45 of an inch. California (Edwards)."—*Packard, l. c.*

I have examined the type (in bad condition) and three unset but fresh specimens. The discal points are present, not absent, as Packard states. This species agrees closely in form with *fenestrella*, but differs by the ochery color of the basal and marginal fields of the primaries.

I give here, for convenience of the student, two unrecognized descriptions in this genus, by the late Dr. Clemens, in Proc. Acad. Nat. Sci. Phila. p. 205, 1860. It must be confessed that Dr. Clemens's descriptions in this group omit so many essential characters that it is doubtful if the species he intends can be identified with certainty.

"*N. ? ulmi-arrosorella.*—Female. Grayish-fuscous. Fore wings with a slender, dark fuscous angulated line, edged on the costa internally by a pale grayish spot, and on the inner margin externally by another of the same hue. The subterminal line pale gray, dark margined internally. Hind wings pale brownish, darker on the margin.

"The larva is found on the American Elm in August. The head is pale brown, dotted with dark brown. The body dark green, with a dorsal, double line of pale green patches, and a slight subdorsal and stigmatal line of the same hue. On the 1st, 2d, 4th, 5th and 10th rings, are brown subdorsal points. It weaves a web on the surface of the leaves, feeding beneath it. The pupa is contained in a web between united leaves, in the vivarium. It becomes a pupa about the middle of August, and an imago about twelve or fourteen days after transformation."

"*N. undulatella.*—Labial palpi, head and thorax grayish fuscous. Fore wings grayish fuscous, with an angulated white line crossing the disk, sometimes obsolete above the fold, margined with dark brownish, and a subterminal line of the same hue dark margined on both sides. At the end of the disk is a short blackish transverse line, slightly margined exteriorly with whitish. Hinder margin tipped with blackish, cilia grayish fuscous. Hind wings grayish testaceous; cilia paler.

"Penna., Canada and Mass. From Dr. Charles Girard, Washington, D. C.

"Early in October, I found pupæ of this insect at Niagara Falls, on the Canada side, under shelter of loosened portions of the bark of the American Elm. They were enclosed in a cocoon of silk, mixed with particles of bark. On the same tree I took a number of larvæ which were descending the trunk to undergo pupation. I did not, however, obtain imagos from any of the specimens. The body was nearly uniform in diameter, with the ordinary number of feet. Head as broad as the body and dark green. Body dark green, between the segments yellowish and dotted with yellow; first rings with two black dots on the sides."—*Proc. Acad. Nat. Sci. Phila.* 1860, p. 205.

PINIPESTIS *Grote.*

Head with a transverse thick ridge of scales behind; frontal scales forming a projecting bunch. Maxillary palpi alike in both sexes, concealed by the porrect labial palpi, which exceed the front. Ocelli. Male antennæ thicker than in the female, with the joints not apparent, very slightly bent at base, where they show a ridge of thin tuftlets of scales, pubescent beneath. Fore wings 11-veined, with veins 4 and 5 running close together at base, but having a separate origin. Hind wings 8-veined, vein 5 running close to 4, but independent, and continuous with the cross-vein.

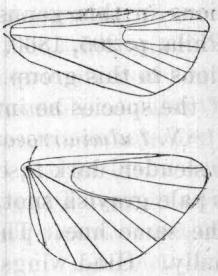


Fig. 10.

Pinipestis Zimmermani, fig. 10 (neuration).

Pinipestis Zimmermani, Grote, Can. Ent. 9, 161 (*Nephopteryx.*)

♂ ♀. Blackish-gray, shaded with reddish on the basal and terminal fields of the fore wings. There are patches or lines of raised scales on the basal field and on the anterior and darker portion of the median space behind the transverse line; also the exterior line and discal mark are accompanied by raised scales. Median lines prominent, consisting of double black lines enclosing pale bands. The inner line at basal third is perpendicular, dentate. The outer line at apical fourth is once more strongly indented below costa. The median field is blackish, becoming pale outwardly; it shows a pale, sometimes whitish, discal spot, surmounted by raised scales. The terminal edge of the wing is again pale or ruddy before the terminal black line. Fringes blackish. Hind wings pale yellowish-white, translucent, shaded with fuscous on costal region, and more or less so terminally, before the terminal blackish line; fringes dusky. Beneath, the fore wings are blackish, marked with pale on costa; hind wings as on upper surface. Body blackish gray, with often a reddish cast on thorax above and on the vertex. Abdomen gray, annulated with dirty white; legs dotted. Expanse, 26–30 mil.

The species varies in the amount of reddish on the basal and terminal fields; the raised scales are easily lost in handling the living specimens.

The *larva* is found in the Middle States, New York and Pennsylvania, in June and July, beneath the bark of the Red Pine and the White Pine (*Pinus resinosa* and *P. strobus*); also on the Scotch, Russian, and Austrian imported pines. The wounds occur on the main stem, usually below the insertion of the branch. On cutting into the bark beneath the exuding pitch, the larva may be found, which measures about 18 millimetres when full-grown. The head is shining chestnut-brown, with black mandibles. The body is livid or blackish-green, naked, with series of black dots, each giving rise to a single bristle. The prothoracic shield is blackish. The larva has three pair of thoracic or true-jointed feet and four abdominal or false feet, besides anal claspers. This larva, eating on the inner side of the bark, and making furrows in the wood, causes the bleeding, which, when the depletion is excessive or continuous, and especially in the case of young trees, has proved fatal. In July, the worm spins a whitish, thin, papery cocoon in the mass of exuded pitch, which seems to act as a protection to both the larva and chrysalis. The *pupa* is cylindrical, smooth, narrow, blackish-brown, about 16 millimetres in length. The head is pointed, there being a pronounced clypeal protuberance; the segments are unarmed; the anal plate is provided with a row of four spines, and two others, more slender, on either side of the mesial line, below the first. It gives the moth in ten to fourteen days.

Pinipestis Zimmermani seems to be one of the most destructive of Lepidopterous insects to timber. I have seen a number of young pine-trees killed by it. It is an American form, and differs structurally from the European *Dioryctria abietella* by the peculiarities of the male antennæ and the different position of veins 6 and 7 with regard to the cross-vein on primaries.

It is not certain how the hibernation of *P. Zimmermani* is accomplished. From the fact that Mr. Zimmerman has found larva resembling those of this species in the clots formed by the exuding pitch in January, it may be that the species winters in the larval state, and that it is single-brooded. The identification of these winter larvæ is not complete. In color they were more pinkish than the specimens taken in June, and (but this might be expected) smaller in size. Again, whether the larva feeds on the gum or not is uncertain, though certain of the facts observed point to this conclusion.

For an opportunity of examing specimens of *Dioryctria abietella*, I am indebted to Mr. Charles D. Zimmerman. The joints of the antennæ are distinct, so as to give a serrated appearance to these organs. The European species is much smaller and less brightly colored than Zimmerman's Pine Pest, and wants notably the patches of raised scales on the wings, on which I have dwelt in my original description, and which are so distinctive of *Zimmermani*. There cannot remain the faintest doubt of the distinctness of Zimmerman's Pine Pest from the European *abietella*. The probable difference in the clypeal structure of the pupa and the differing habit of the larva of *Zimmermani*, as compared with

the characters given by Ratzburg of *abietella*, I have alluded to in my original paper on the subject.

But on examining the neuration of *abietella* I find that on the fore wings veins 4 and 5 are not furcate, but spring, as in *Zimmermani* and the species I here refer to *Nephopteryx*, separately from the median vein, running so close together at base that they appear to be furcate at their point of divarication. I also find that the origin of 6 and 7 is different from *Zimmermani* and the species I here refer to *Nephopteryx*. In *abietella*, 6 joins 7 at the point of issue of the discal cross-vein; in *Zimmermani*, 6 joins 7 before the cross-vein, which arises from 6. On the hind wings in *Pinipestis*, vein 5 is independent; but, in *Dioryctria abietella*, vein 5 is joined to the median vein close to the point of origin of 4 and 3. I find thus that Heineman's diagnosis of *Dioryctria* is correct, except that, if by "Ast 4 und 5 auf gemeinschaftlichem Stiele" he means that 4 and 5 are furcate, as I have understood him, he has made the same error that I did at first in considering these veins furcate in *Zimmermani*.

Pinipestis? abietivorella, n. s.

Under the MS. name of *Pempelia abietivorella*, Dr. Packard sends me a single fresh female specimen, which bears at first sight a close resemblance to the European *abietella*, but agrees in neuration with *Pinipestis*. Vein 5 of the hind wings is independent; veins 4 and 5 of the primaries are not furcate, and the position of the cross-vein is as in *Zimmermani*. But as I do not know the male of this new Pine Pest, I cannot surely indicate its generic position. It may belong to *Salebria*. The moth has so close a resemblance to *abietella* that I took it for that species until I examined the neuration. It seems a little larger, the primaries more blackish, powdered with white. There are no raised scales on the fore wings and no red tints, so that it cannot be confounded with *Zimmermani*. The anterior line is more dentate and the posterior line broader than in *abietella*. The moth was received by Dr. Packard from Prof. H. W. Parker, of Amherst, Mass. The larva was found two-thirds grown, "boring in top of a tree of the Norway Spruce It was smooth, slender, dark brown. Taken the first week of August. Full grown it measured $\frac{3}{4}$ inch, and pupated in cocoon formed of its own excrement and silk the last of August. The imago was found fresh and alive Sept. 19." This Norway Spruce moth must not be confounded with *Salebria fusca*, which it very nearly resembles. The fore wings are more powdered with white, the posterior line broader, while in *fusca* vein 6 on fore wings is thrown off from the cross-vein further from 7. This new moth cannot be a *Pempelia* from the 8-veined secondaries, nor can I refer it as congeneric with the species I here refer to *Nephopteryx* from the position of vein 5 of the hind wings. *Salebria fusca* is apparently a larger moth than *abietivorella*, and may be most quickly distinguished by the discal points being black, superposed, and sometimes coalesced, while in *Pinipestis? abietivorella* and the European *Dioryctria abietella* the discal mark of primaries is white.

HONORA, *n. g.*

The ocelli are prominent. Male antennæ without peculiarity, pubescent beneath. Labial palpi not very long, porrect, thickly scaled, the rather long and stout third article concealed by the vestiture. Maxillary palpi small, scaled. Fore wings narrow and long, 11-veined, 4 and 5 furcate; hind wings 7-veined, 5 wanting, 3 and 4 furcate on a long stem just before the margin; 6 continuous with the discal cross-vein on the upper corner of the cell; 8 out of 7, a short furcation; 2 out of the lower angle of the cell, which is closed.

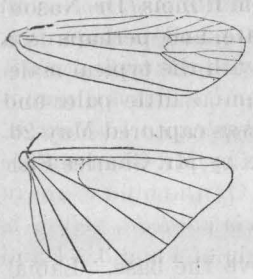


Fig. 11.

This genus seems to me to fall in with Section C of *Stenoptycha*, according to Heineman, but I have not the European *oblitella* to compare. The differences between these sections seem to me as important as those considered by Heineman of generic value in the group.

Honora mellinella, n. s., fig. 11 (neuration).

♂ ♀. Fore wings blackish-fuscous, with a pale, undefined, costal shading. Interior line white. A yellow shade-spot beyond the line on internal margin. Two separate, very small, dark, discal dots. Exterior line near the margin, even, narrow, and indistinct white. Base of the wing yellowish. Anterior line not continued to costa. Hind wings very pale fuscous, silky, with concolorous fringes. Head and thorax faded ocherous. Three specimens (Texas, Belfrage, No. 443). The expanse varies from 15 to 19 mil. I sent this species to Prof. Zeller, under the number 376, but received no determination of the species.

DAKRUMA, *n. g.*

Ocelli small. Male antennæ very slightly bent at base, where they show a little thicker coating of scales. Labial palpi rather short, with the terminal joint subequal. Maxillary palpi scaled, small in both sexes. Wings rather long and narrow. Fore wings with 11 veins, the cell closed by a fold; 4 and 5 furcate from a single stem; 8 out of 7. Hind wings 7-veined; cell closed by a fold; the subcostal vein joined to the costal by a short branch beyond the closure of the cell; 8 out of 7, a very short furcation before apices; 3 and 4 furcate just beyond the cross-vein.

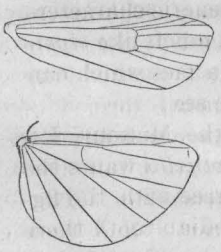


Fig. 12.

This genus differs from *Homeosoma* by the 11-veined primaries and the absence of the suprabasal constriction of the male antennæ; on the hind wings, veins 3 and 4 furcate beyond the cell.

Dakruma turbatella, fig. 12 (neuration).

♂ ♀. Whitish-gray. Cell striped with white. Inner line thick, blackish. A black discal upright streak. Outer line double, blackish, with broad, white, included space, oblique, a little uneven, twice more promi-

nently toothed, somewhat diffuse. Veins finely marked. Terminal minute dark dots. Fringes fuscous-gray. Hind wings very pale fuscous, with paler interlined fringes. Beneath fuscous-gray. Body whitish beneath, above fuscous-gray. One male from Illinois (Dr. Nason) has the outer line narrower, more acutely bidentate, and perhaps is a different species; it appears otherwise to agree with the typical male. This species expands 25 mil. The hind wings seem a little paler and more pointed in the male. The Illinois specimen was captured May 26. I have examined three females and one male taken by Mr. Charles Fish at Oldtown, Me.

HOMEOSOMA *Curtis.*

The male antennæ are suddenly constricted above the base. Labial palpi porrect; maxillary palpi small, scaled. Fore wings with 10 veins; 4 and 5 from a rather long stem; vein 8 wanting. Hind wings with 7 veins; veins 3 and 4 have a separate origin out of the lower angle of the cell; 8 out of 7, a very short furcation before apices.

The hind wings differ from those of *Dakruma* by the origin of veins 3 and 4, which is a separate one; vein 4 from the cross-vein close to 3, whereas in *Dakruma* 3 and 4 are furcate beyond the closure of the cell.

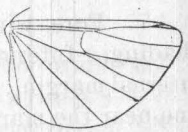


Fig. 13.

Homeosoma stypticella, fig. 13 (neuration).

♂ ♀. Dusty whitish-gray; wings narrow; a diffuse, blackish, anterior line; discal spot formed of two, blackish, superposed or coalesced dots near the outer line, which is even, oblique, bordered on either side by a blackish shade, the outer of which sometimes wanting and indicated by a costal mark. Hind wings smoky-pellucid, with paler fringes. Beneath smoky, immaculate. Average expanse, 19 mil.

Three males and ten females examined. Maine, Massachusetts, New York (Lewis County), W. W. Hill. There are probably similar species not yet described, and attention must be paid to the generic characters. Several females in my collection indicate such species, much like *stypticella* in appearance, but probably generically distinct, a fact which cannot be easily established without reference to the male sex.

It somewhat resembles the figure 17 on Plate 2 of the Missouri Reports as that of *Pempelia grossulariæ* Packard; but *stypticella* wants the double band forming the anterior line. It does not agree with the figure on page 140, because the outer line wants the submedian tooth there shown, and the wings are narrower. I regret not to have identified as yet this species of Dr. Packard's, which is probably incorrectly generically referred, and of which no structural characters of value are given by Mr. Riley.

ANERASTIA *Hübn.*

Male antennæ a little bent at base, without scale-tuft, ciliate beneath, the joints conspicuous. Ocelli wanting. Labial palpi long, porrected.

Fore wings 10-veined; median vein 3-branched, a single vein representing 4 and 5. Hind wings with 7 veins; 3 and 4 furcate on a long stem; 2 before the lower angle of the cell. Tongue present.

Anerastia hæmatica Zell., fig. 14 (neuration).

Anerastia hæmatica Zell., Verh. Zool.-Bot. Ver. p. 555, 1872.
Nephopteryx roseatella Pack., Ann. N. Y. Lyc. N. H. 270, 1873.

♂ ♀. Head and thorax dull yellow, more or less stained with rosy-brown. Fore wings with a pale yellow costal stripe running to a point and expiring before the tips; else the silky primaries are dull roseate, shading to fuscous below the stripe and fading to yellowish at internal margin. Hind wings very pale yellowish-fuscous. Fringes on both wings yellowish; beneath silky yellowish-fuscous. The species expands 17 to 19 mil. I have examined four specimens of both sexes, including Dr. Packard's type. Maine, Massachusetts. Whether the maxillary palpi are present, I have not yet been able to decide.

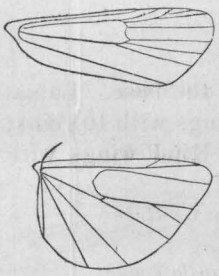


Fig. 14.

There is no doubt on my mind, after examining Packard's type, that it is the same species previously described by Zeller. It appears that Zeller has recognized a second closely allied species from a specimen sent him by Packard, which differs from *hæmatica* by the thinner, longer, labial palpi, with a brown stripe from the 2d joint outwardly to the tip. The costal stripe is said to be powdered rather thickly with brown. Packard's type does not show any brown powdering, and I cannot recognize any palpal stripe. The palpi are stained with purplish. I do not think it is likely that these characters are specific. My other specimens show a variation in size and distinctness of the reddish tinge on primaries, but I cannot see either the character pointed out by Zeller or any others on which to infer two species.

Of this species, Dr. Packard says in the body of his description :—"It has all the structural characters of *Nephopteryx*." But in his remarks upon it a little lower down he says :—"Though the antennæ are without the usual tuft of scales, and the palpi are longer than usual, I should judge that it was a *Nephopteryx*." It is, however, as I have above explained, abundantly distinct from *Nephopteryx* in structure.

It is quite necessary that the structure in this group should be fully reported in describing species. I am prevented from identifying *Pempelia Hammondi* with certainty, because the characters of the maxillary palpi and venation are not given by Mr. Riley. In the absence of an examination of the generic characters in this group, any opinion on the validity of "modern genera" must, I think, be without value.

The following is a provisional list of our species :—

PHYCIDÆ.

ACROBASIS *Zell.*
exulella *Zell.*
rubrifasciella *Pack.*
tricolorella *Grote.*
indiginella *Zell.*
Phycita nebulo Walsh.
var. juglandis *Le Baron.*

SALEBRIA *Zell.*
fusca *Haw.*

PEMPELIA Zell.
pravella *Grote.*
lignosella *Zell.*
incautella *Zell.*
petrella *Zell.*
? tartarella *Zell.*
? virgatella *Clem.*
? subcæsiella *Clem.*
? Hammondi *Riley.*
? grossulariæ *Pack.*

NEPHOPTERYX *Zell.*
ovalis.
♂ *Pempelia ovalis* Pack.
♀ *N. latifasciella* Pack.
fenestrella.
Pempelia fen. Pack.
leoninella.
Pempelia leon. Pack.
? basilaris *Zell.*
consobrinella *Zell.*
? undulatella *Clem.*
? ulmi-arrosorella *Clem.*
? Edmandsii *Pack.*

PINIPESTIS *Grote.*
Zimmermani *Grote.*
? abietivorella *Pack.*

ZOPHODIA *Hübn.*
Bollii *Zell.*
dentata *Grote.*

MYELOIS *Zell.*
albiplagiatella *Pack.*

HONORA *Grote.*
mellinella *Grote.*

EPISCHNIA *Hübn.*
farrella *Curtis.*

ANERASTIA *Hübn.*
hæmatica *Zell.*
Nephop. roseatella Pack.
tetradella *Zell.*
glareosella *Zell.*
binotella *Zell.*

EPHESTIA *Guen.*
elutella *Hübn.*
ostrinella *Clem.*
interpunctella *Hübn.*
Zeæ Fitch.
ochrifrontella *Zell.*
hospitella *Zell.*

SPECIES DESCRIBED.

Prorasea simalis.
Aedis funalis.
Stemmatophora nicalis.
Asopia devialis.
squamealis.
Arta statalis.
olivalis.
Melanomma auricinctaria.
Scoparia libella.
Emprepes nuchalis.
Botis albiceralis.
plumbicostalis.
anticostalis.
syringicola.
talis.
stenopteralis.
Epipaschia superatalis.
Mochlocera Zelleri
Cacozelia basiochrealis.
Toripalpus breviornatalis.
Tetralopha asperatella.
platanella.
militella.
robustella.
Acrobasis rubrifasciella.
tricolorella.
Pempelia pravella.
Salebria fusca.
Nephopteryx ovalis.
fenestrella.
leoninella.
undulatella.
? ulmi-arrosorella.
Pinipestis Zimmermani.
? abietivorella.
Honora mellinella.
Dakruma turbatella.
Homeosoma stypticella.
Anerastia hæmatica.

ART. XXVIII.—PALEONTOLOGICAL PAPERS NO. 6: DESCRIPTIONS OF NEW SPECIES OF INVERTEBRATE FOSSILS FROM THE LARAMIE GROUP.

By C. A. White, M. D.

The fossils described in this paper were collected by the writer (unless otherwise stated in connection with the description) from the strata of the Laramie Group, during the season of 1877, in Colorado, Wyoming, and Utah. Many other associated species were also collected, but only the hitherto undescribed forms are noticed in this paper.

Of the numerous invertebrate forms hitherto collected from the strata of this great group, except some insect remains (to be described by Mr. S. H. Scudder), and a few unstudied Ostracoid Crustaceans, all are molluscan.

CONCHIFERA.

Genus VOLSELLA Scopoli.

Subgenus BRACHYDONTES Swainson.

Volsella (Brachydontes) regularis (n. sp.).

Shell arcuate-subovate in marginal outline; valves moderately convex; upper margin more or less strongly arched from beak to rear; thence with a continuous but stronger curve to the postero-basal margin, which is somewhat abruptly rounded to the gently concave base; front moderately narrow, slightly projecting beyond the beaks, and abruptly rounded to the base; beaks depressed, scarcely perceptible as such, and nearly but not quite terminal; hinge-margin short, nearly straight; umbonal slope somewhat prominent, but conspicuous only by increasing the apparent concavity of the basal part of the shell. Surface marked by numerous, rather coarse, radiating lines, or small costæ, which increase in size toward the free margins of the shell. These costæ have generally a somewhat crenulated aspect, due in part to small sinuosities in their course, and in part to being frequently crossed by lines and undulations of growth; denticles or crenulations of the short front margin distinct.

Length of the type-specimen 36 millimeters; breadth at the widest part 18 millimeters; but several less perfect examples obtained at different localities indicate a much larger size, the largest of which must have had a length of 6½ centimeters.

Position and locality.—Laramie Group. The type-specimen is from the Valley of Crow Creek, Northern Colorado, 15 miles above the confluence of that creek with South Platte River. Other examples are from Cañon Park, Valley of Yampa River; Danforth Hills, near White River Indian agency, Colorado; and Rock Springs Station, Union Pacific Railroad, Wyoming.

Volsella (*Brachydontes*) *laticostata* (sp. nov.).

Shell transversely elongate, arcuate-subelliptical; upper border broadly and almost regularly arched; posterior border somewhat abruptly but continuously rounded from the upper border to the base, which latter border is gently concave along its middle portion; front abruptly rounded, beaks inconspicuous, situated near the front; hinge-line short, nearly straight, not forming an angle with the remainder of the upper border; denticles, or crenulations of the anterior border, distinct. Surface marked by the usual distinct lines of growth, and also by fine radiating costæ, which are obsolete along the whole length of the median portion of the shell, and are more distinct upon and near the dorsal border than elsewhere.

Length 5 centimeters; greatest width 19 millimeters.

This species differs conspicuously from the preceding one, which is from the same formation, in its greater proportionate length, the straighter and less crenulate character of its costæ, and their absence or obsolescence upon the median portion of the shell.

Position and locality.—Laramie Group, about 400 feet from its base; Danforth Hills, near White River Indian agency, Colorado.

Genus NUCULANA Link.

Nuculana inclara (sp. nov.).

Shell small, elongate-subovate in marginal outline, gradually narrowing behind the beaks. Beaks not prominent, situated about one-third of the full length of the shell from the front; valves only moderately convex, even in the anterior and umbonal regions, and without distinct umbonal ridges. Basal margin broadly semi-elliptical; anterior margin regularly rounded from the cardinal margin to the base; postero-basal margin sloping upward to the posterior margin, which is sharply rounded to the cardinal margin; the latter margin slightly arched, or the anterior and posterior portions of it forming a very slight angle with each other; denticles minute, numerous, 12 to 15 or more in front of the beak and a greater number behind it.

The few examples discovered being only casts, the true character of the surface is not known, but it appears to have been marked with only the usual concentric lines of growth. Character of the pallial line unknown.

Length 11 millimeters; height from base to beaks 5 millimeters. No

examples larger than this were discovered, but it is possible that those obtained are under full adult size.

Position and locality.—Laramie Group, about 400 feet above its base; Danforth Hills, near White River Indian agency, Northwestern Colorado.

Genus ANODONTA Cuvier.

Anodonta parallela (sp. nov.).

Shell transversely much elongate, oblong or semi-elliptical in marginal outline; valves gently convex, apparently a little more so near the front than elsewhere; beaks situated about two-sevenths the length of the shell from the front, depressed, the elevation of the umbonal region being hardly perceptible; hinge-line long; the whole dorsal border nearly straight; both anterior and posterior borders regularly rounded; that of the posterior being a little more abruptly rounded than the front; base nearly straight, or very slightly emarginate along or a little in front of the middle. Test thin; surface smooth or marked only by the ordinary lines of growth and one or two faint ridges running from the beaks to the postero-dorsal margin.

Length 62 millimeters; breadth 20 millimeters.

The extraordinary length of this shell compared with its width is an unusual feature in this genus; but all the other characteristics of the species, so far as they can be observed on the specimens yet discovered, indicate it to be a true *Anodonta*, and its immediate associates are also all fresh-water shells. Only two examples have been discovered, both imperfect; but together they show all the essential characteristics of the species. Notwithstanding its unusually elongate form, the character of the test and its edentate hinge apparently leave no doubt as to its generic character as here indicated.

Position and locality.—Laramie Group; Valley of Crow Creek, Northern Colorado, about 10 miles above the confluence of the creek with South Platte River.

Genus UNIO Retzius.

Unio goniambonatus (sp. nov.).

Shell of medium size, transversely elongated, subtrihedral in marginal outline, being rapidly narrowed posteriorly from the anterior portion; moderately gibbous, most so a little in front of its mid-length and above its mid-height; test somewhat thick; beaks placed near the anterior end, moderately depressed; umbones slightly raised above the hinge-line; umbonal ridge distinct, angular, and so prominent as to produce a flattened or even slightly concave space between it and the hinge-margin, giving the whole back of the shell a broadly flattened aspect; front margin regularly rounded from beneath the beaks to the basal margin, which latter margin is nearly straight or only slightly convex, especially behind the anterior third of its length; postero-basal margin narrowly rounded to the postero-dorsal margin, which meets the former

with an elongated downward and backward slope from the hinge-margin; the latter margin nearly straight, and occupying about two-thirds the whole length of the shell. Surface marked by only the ordinary lines and coarser imbrications of growth, but usually the angular umbonal ridge is cut across by three or four short, distinct ridges and corresponding furrows, extending obliquely inward and backward, being scarcely perceptible in front of the umbonal ridge, and becoming obsolete before reaching the postero-dorsal margin, or at least only producing slight sinuosities upon it.

Length 58 millimeters; height from base to umbones 34 millimeters; thickness 28 millimeters.

The elongate subtriangular outline, prominent and angular umbonal ridges, and broad, flattened dorsum of this species, are features that readily separate it from all other known forms, and, together with the seven other species associated with it (mentioned in the next description), show an extent and diversity of differentiation among these earlier species of *Unionidæ* that is hardly surpassed at the present day.

Locality and position.—Upper part of the Laramie Group; Black Buttes Station, Union Pacific Railroad, Wyoming.

Unio aldrichi (sp. nov.).

Shell of medium size, transversely elongate, approximately oblong in marginal outline, a little higher posteriorly than anteriorly; moderately gibbous, especially along the umbonal ridge, where the shell is thickest; test moderately thick, becoming much so in old shells; beaks placed nearly one-third the length of the shell from the front margin, incurved, broad, but not very prominent, although the flattened umbo is raised above the level of the hinge-line; umbonal ridge prominent, subangular; postero-dorsal portion of the shell behind this ridge compressed, sometimes subalate; front portion of the shell moderately gibbous, and between this and the umbonal ridge the sides are distinctly flattened; anterior margin regularly, but somewhat narrowly, rounded down to the basal margin, which is nearly straight along the middle; postero-basal margin somewhat narrowly rounded, and extended upward and backward to the postero-dorsal margin; the latter margin sometimes truncated obliquely downward and backward, and sometimes so rounded as to give a more nearly square truncation to the posterior end of the shell; hinge-line long and straight. Surface marked only by the ordinary lines of growth, except all that portion which lies behind the umbonal ridge. This portion is marked by numerous sharply-raised, irregular lines or narrow ridges, with the intervening spaces wider than the ridges themselves, which, beginning almost imperceptibly just behind the umbonal ridge, extend backward with a greater or less upward curve to the dorsal and posterior borders. These raised ridges increase in number with the growth of the shell, in very small part by implantation, but mainly by bifurcation. They usually constitute a conspicuous

surface-feature of the shell, but in some examples they are more or less obsolete. Their character is similar to that of the markings upon *U. senectus* and *U. primœvus* White, especially the latter.

Length of the largest discovered example 82 millimeters; height at mid-length 48 millimeters; thickness about 32 millimeters.

The specific name is given in honor of Mr. Charles Aldrich, formerly a member of the Survey.

Position and locality.—Upper part of the Laramie Group, Black Buttes Station, Union Pacific Railroad, Wyoming, where it is found associated with *U. brachyopisthus*, *U. couesi*, *U. endlichi*, *U. propheticus*, *U. primœvus*, *U. holmesianus*, *U. goniambonatus* White, and apparently with one or two other species of this genus.

Genus CORBICULA Mergele.

Corbicula cleburni (sp. nov.).

Shell large, subtrihedral in marginal outline; height from base to umbo equal to the extreme transverse length, moderately gibbous and its sides regularly convex, flattened or a little concave along the postero-dorsal portion, concave in front, where there is an almost defined lunule; test thick, or even somewhat massive in the case of old shells; dorsal line forming a somewhat regular convex curve from the beak to the postero-basal portion, which latter portion is abruptly, sometimes almost angularly, rounded to the base; basal margin almost regularly rounded up to the antero-cardinal margin, but its convexity is usually a little greatest in front of the mid-length; antero-cardinal margin straight or slightly concave, meeting the antero-basal margin at an obtuse angle or a prominent abrupt curve; beaks prominent, elevated, curving inward and forward, and ending in a well-defined point when well preserved, as most of the examples are; lateral teeth strong, well developed, and finely crenulate; cardinal teeth well developed, the outer posterior one in one example showing faint crenulations, but otherwise of the ordinary character; pallial line distinct, somewhat distant from the margin; sinus small, directed strongly upward. Surface marked only by the usual lines and undulations of growth.

Height of the largest example 42 millimeters; extreme transverse length about the same; thickness 32 millimeters.

This species bears more resemblance to *C. cytheriformis* M. & H. than to any other published species; but it may be distinguished from that species by its more distinctly trihedral outline, its greater proportionate height, and its concave, almost lunulate front.

Position and locality.—Laramie Group, Crow Creek, Colorado, about 12 miles north of its confluence with South Platte River.

Corbicula cardiniœformis (sp. nov.).

Shell somewhat above medium size for a species of this genus, transversely subelliptical, moderately gibbous, especially a little forward of

and above the middle, but somewhat compressed toward the free margins, especially in the posterior region; front and posterior margins narrowly and the basal broadly rounded, forming together a nearly true semi-ellipse; cardinal margin broadly rounded and sloping gently downward from the beaks to the posterior margin; antero-dorsal margin slightly concave just forward of the beaks, where the shell is also slightly concave; umbonal portion of each valve prominent; beaks narrowed, distinctly defined, not much elevated, but pointing strongly forward and incurved. Hinge and interior markings unknown.

Length from front to rear 59 millimeters; height from base to beaks 38 millimeters; greatest thickness, both valves together, 28 millimeters.

In outward appearance, this species seems to occupy an intermediate position between the usual short forms of *Corbicula* and that section of the genus which was separated by the late Mr. Meek under the subgeneric name of *Leptesthes*. It differs, however, from any species of that section known to me in the narrowness and distinct definition of the beaks; the umbonal region being broad and the beaks depressed and illy defined in all the published species of *Leptesthes*.

With the exception of the differences named, and which seem to be correlated subgeneric differences, the shell here described resembles in general aspect some of the shorter varieties of *Corbicula* (*Leptesthes*) *fracta* Meek. For a more general comparison, however, it so nearly resembles some species of *Cardinia* as to have suggested the specific name which is here applied to it.

Position and locality.—Laramie Group, Valley of Crow Creek, 15 miles above its confluence with Platte River, Northern Colorado.

Corbicula obesa (sp. nov.).

Shell small or not above the average size for species of this genus, inflated; sides somewhat regularly convex, suboval, or subtrihedral in marginal outline; transverse length somewhat greater than the height; basal margin almost regularly rounded, meeting both the posterior and anterior margins by regular and nearly equal curves; postero-dorsal portion regularly rounded from the beaks to the posterior margin; antero-cardinal margin straight, but the shell has a concave appearance in front on account of the slight forward prominence of the beaks; postero-cardinal margin very little, if any, depressed below the adjacent portions of the shell; beaks small, pointed, not prominent, but directed a little forward, and placed only a little in advance of the mid-length; lateral teeth well developed, but slender, and apparently not crenulate, but the condition of the examples in hand was not conclusive upon this point; cardinal teeth well developed, but not robust; pallial sinus small. Surface marked only by the usual lines of growth, and these being mostly very fine, the surface has a comparatively smooth, or sometimes even a polished aspect in well-preserved examples.

Transverse length of a medium-sized specimen 30 millimeters; height from base to beak 26 millimeters; thickness 20 millimeters.

This species differs too materially from any known described species to need detailed comparison.

Position and locality.—Laramie Group Valley of Crow Creek, Colorado, 15 miles north of its confluence with South Platte River.

Subgenus LEPTESTHES Meek.

Corbicula (*Leptesthes*) *macropistha* (sp. nov.).

Shell small, longitudinally subelliptical or subovate, broader (higher) posteriorly than anteriorly, slightly gibbous or somewhat compressed; test strong but not massive; basal margin broadly convex, posterior margin truncating the shell, and its direction being upward and a little backward, and abruptly rounded to both the postero-cardinal and basal margins; postero-cardinal margin broadly convex; antero-cardinal margin nearly straight and directed obliquely downward and forward to the front, which is abruptly rounded to the base; beaks depressed, not well defined, and not projecting above the hinge-line, placed about one-third the length of the shell from the front. Surface showing the usual lines and imbrications of growth, and well-preserved examples show that the former were so fine as to give an almost polished aspect to the surface. Lateral teeth well developed and finely crenulate, cardinal teeth well developed, and having the usual characters of the genus; pallial line somewhat distant from the margin; sinus shallow.

Length of an average-sized example, among the typical examples of the collection, 21 millimeters; height 15 millimeters; thickness, both valves together, 10 millimeters.

There are two or three examples in the collection, that were obtained from layers separated by only a few feet, that are considerably larger than the above dimensions, but these, having some other modifications of form, are referred to this species with doubt.

This shell evidently belongs to the section designated as *Leptesthes* by Meek. Among other peculiarities of this section, internal casts of it show a distinct but shallow and somewhat broad furrow, extending downward and forward from the hinge-margin behind the beaks to about the middle of the shell; and the inner surface of the valves show the corresponding ridge. This, in this species at least, is really not so much a true ridge as it is a sudden thinning of the shell, along a nearly vertical line, in its posterior half.

The peculiar flattening of the umbonal and upper middle portions of the shell, its greater width, and equal if not greater thickness behind than in front, are characters by which the species may be readily recognized.

Position and locality.—Laramie Group, Crow Creek, Northern Colorado, 15 miles above its confluence with the South Platte River.

Genus ACELLA Haldeman.

Acella haldemani (sp. nov.).

Shell very small and very slender; spire longer than the aperture; volutions about six and very obliquely coiled, slightly convex; last one not ventricose; aperture only slightly, if at all, expanded, its outer margin, as shown by the lines of growth, being nearly parallel with the axis of the shell. Surface marked by numerous lines of growth parallel with the border of the aperture and nearly parallel with the axis of the shell. These, owing to the minute size of the shell, are distinguishable only under a lens of considerable power.

Length 6 millimeters; diameter of last volution 1½ millimeters.

The specific name is given in honor of Prof. S. S. Haldeman, the author of the genus.

Position and locality.—Laramie Group, Valley of Bear River, near the confluence of Sulphur Creek, Wyoming.

Genus PHYSA Draparnaud.

Physa felix (sp. nov.).

Shell large; body-volution inflated, shouldered at the distal side, which is somewhat abruptly rounded from the outer side and near the suture, at nearly right angles with the axis of the shell; spire comparatively small, and appears to have been only moderately elevated. Surface marked by the usual lines of growth, except that of the whole shouldered portion from the suture outward, which is marked by numerous small, obliquely triangular papillæ, which are arranged in oblique rows that coincide nearly with the lines of growth.

The full length of the body-volution was not less than 38 millimeters.

Only two fragments of this remarkable *Physa* have been discovered, but the characters shown by them, as recorded above, are sufficient to distinguish it from any other species, and when more perfect examples are found it may show different generic characters also.

Position and locality.—Laramie Group, Crow Creek, Colorado, 10 miles above its confluence with the Platte.

Genus HELIX Linnæus.

Helix evanstonensis (sp. nov.).

Shell small, subglobose, wider than high; spire somewhat prominent, its sides convex, terminating in a moderately acute apex; volutions about six, convex; last one a little inflated and regularly rounded from the suture to the center of the base; suture distinct; umbilicus closed with a callus; base flattened in the middle, scarcely depressed; aperture oblique; outer lip reflected. Surface marked by numerous very distinct raised lines of growth parallel with the outer lip.

Height 6½ millimeters; breadth of last volution 9 millimeters.

Genus NERITINA Lamarck.

Neritina naticiformis (sp. nov.).

Shell small, subglobose in aspect, being more nearly like that of *Natica* than the usual forms of *Neritina*, due mainly to the greater elevation of the apex, consisting of three or four volutions, which so rapidly increase in size that the last one comprises much the greater part of the bulk of the shell; all the volutions regularly convex, the suture being distinct; test not massive; aperture large, nearly straight on the inner side, and regularly convex on all other sides, the whole comprising more than a semicircle; edge of the outer lip thin; inner lip moderately broad, flattened, apparently smooth, sloping strongly inward, or away from the outer lip; inner margin of the inner lip somewhat concave, apparently without crenulations.

Surface marked by numerous distinct lines of growth, and upon some examples traces of revolving striæ have been detected, especially upon the proximal or lower portion.

Extreme length from apex to front margin 6 millimeters; greatest diameter of the last volution, across the middle of the aperture, about the same.

In general aspect, this little shell so closely resembles a *Natica* that, the apertures all being filled with the imbedding material, the first suggestion that it might not belong to that or a closely allied genus came from its association with fresh- and brackish-water forms. Upon breaking up some of the examples, the inner lip was found to be more characteristic of *Neritina* than *Natica*, although it is not so broad and characteristically developed as is usual in the former genus. In this respect, and in the moderately thin test, it departs from typical forms of *Neritina*.

Position and locality.—Laramie Group, Bear River Valley, near the mouth of Sulphur Creek, Wyoming.

Subgenus VELATELLA Meek.

Neritina (*Velatella*) *baptista* (sp. nov.).

Shell small, elliptical in outline, broadly convex above, the convexity of the postero-median portion being greater than elsewhere, nearly flat beneath; umbo prominent, nucleus or apex posterior, minutely subspiral and only a little elevated above the posterior margin, small, closely incurved, and turned to the right side; inner lip broad, smooth, slightly convex in all directions, and occupying fully one-half of the under surface of the shell; outer lip apparently moderately thin, but this feature has not been clearly seen.

Surface so nearly smooth as to give the shell an almost polished appearance, but under the lens minute striæ of growth are visible, and also especially near the borders minute radiating striæ are seen, apparently in the substance of the shell. In addition to this, there are, upon the only example discovered, seven or eight irregular radiating

stripes of coloration of the shell. These are now brownish in color, while the general surface is buff; both doubtless different from those that characterized the shell while living, but no doubt correctly representing them in shape, relative position, and contrast.

Length 10 millimeters; breadth 7 millimeters; height 5 millimeters.

This species resembles in many respects the *N.* (*V.*) *patelliformis* Meek, especially the variety *weberensis* White, but it differs from the former in form, and from the latter in being without any trace of radiating, raised lines or costæ, in the greater prominence of the umbonal portion, and its more conspicuous apex. Its coloration is not taken into account, as its preservation is deemed only accidental.

Position and locality.—Laramie Group, Black Buttes Station, Union Pacific Railroad, Wyoming.

Genus GONIOBASIS Lea.

Goniobasis endlichi (sp. nov.).

Shell moderately elongate-conical; spire with straight or slightly concave sides; volutions six or seven, much and nearly regularly convex, the last one slightly inflated; suture well defined, and appearing unusually deep on account of the convexity of the volutions; aperture ovate, its distal end angular, its front somewhat narrowly rounded, and without a sinus; outer lip apparently sharp; inner lip with a thin reflected callus, more developed toward the front; columella gently arcuate.

Surface marked by fine but distinct lines of growth, which are crossed by very numerous, fine, revolving, raised lines, giving it a cancellated appearance under the lens. In addition to these, there are usually from four to six much larger, nearly equidistant, revolving, raised lines of nearly equal size, visible upon the volutions of the spire, and ten or twelve of the same upon the body-volution. These larger, revolving, raised lines are sometimes absent or obsolete, but the smaller markings are always present.

Length about 22 millimeters; diameter of body-volution 11 millimeters.

This species is evidently nearly related to *G. nebrascensis* and *G. tenuicarinatus* M. & H., and should perhaps be referred to *Pachycheilus* Lea, but the difficulty of learning the exact character of the lip leaves that matter in some doubt.

Specific name given in honor of Dr. F. M. Endlich.

Position and locality.—Laramie Group, 7 miles west of Evanston, Wyo., near the boundary line between Wyoming and Utah.

Genus VIVIPARUS Lamarck.

Viviparus prudentia (sp. nov.).

Shell depressed-subconical; spire short; volutions five and a half or six, including the minute ones of the apex, convex; last one considera-

bly enlarged, composing much the greater part of the shell, almost or quite regularly rounded from the suture to the umbilicus; suture well defined, and rendered still more conspicuous by the convexity of the volutions; umbilicus very small and deep; aperture short, subovate or subcircular, obtusely angular at its distal side; a little straightened by contact with the next volution between that angle and the umbilicus, and elsewhere almost regularly rounded.

Surface smooth, almost polished, but marked by very fine lines of growth.

Length from front to apex 18 millimeters; breadth of body-volution 18 millimeters.

This shell is proportionally shorter than any other species of the genus known to me, but it seems to possess all the characteristics of *Viviparus*. Its outer lip has the usual straight margin, but its umbilicus is a little more open than usual, and the inner lip not reflexed, but almost continuous in its curvature with the outer lip.

Position and locality.—Laramie Group, Crow Creek, Colorado, 10 miles above its confluence with South Platte River, Northern Colorado.

Viviparus cousi (sp. nov.).

Shell very large when fully adult; volutions six or seven, convex, the distal side of the last one especially rounded abruptly in to the suture, giving it a somewhat shouldered aspect there, while the outer side is broadly convex and sloping gently forward and inward; suture deeply impressed, the apparent depth being increased by the great convexity of the volutions. Surface marked by the ordinary lines of growth, no revolving marks of any kind being detected. The lines of growth indicate that the margin of the outer lip was nearly straight, as is usual with species of this genus, and which character distinguishes it from *Campeloma*. Inner lip thickened, and reflexed at the proximal or anterior end, but not covering the umbilical fissure there, which is moderately large. The precise shape of the aperture is unknown, but it is probably ovate.

No entirely perfect examples have been discovered, but the largest one yet obtained would, if perfect, measure about 65 millimeters in length; full width of body-volution 38 millimeters.

This species is described by Meek in vol. iv, p. 181, pl. 17, fig. 15, King's United States Geological Survey of the Fortieth Parallel, and referred to the genus *Campeloma*, but not specifically named. The numerous specimens, however, that have been obtained from the typical and other localities show that the species possesses the true characters of *Viviparus*.

This species is distinguished from all others of the genus known to me in American strata by its great size, and there are few other species with which it is in any danger of being confounded. From *V. paludinæformis* Hall, it differs in its more robust form, in the greater convexity of its volutions and the abrupt rounding of their distal side, and in the presence of a comparatively large umbilical fissure.

Position and locality.—Laramie Group, Valley of Bear River, seven miles northwestward from Evanston, Wyoming, and at several points in the vicinity of Mellis Station, Union Pacific Railroad, near the confluence of Sulphur Creek and Bear River. It is associated with *Campeloma macrospira* Meek, *Unio vetustus* Meek, and other fresh-water mollusks, as well as many brackish-water species.

Genus ODONTOBASIS Meek.

Odontobasis? formosa (sp. nov.).

Shell rather small; spire equal to about one-half its entire length; volutions about six, the body one inflated and the distal ones moderately convex, the distal part of each somewhat shouldered, and marked there by numerous small longitudinal folds that become obsolete toward the proximal part; these longitudinal folds are less distinct upon the body-volution than upon the distal ones; upon the latter also there is a small revolving furrow near to, and upon the distal side of the suture, giving those volutions a slightly constricted aspect, but which constriction does not extend upon the body-volution.

Surface apparently marked only by lines of growth, with the exceptions already mentioned, and some revolving ridges or lines upon the proximal side of the body-volution, near the beak.

Length 12 millimeters; breadth of body-volution 7 millimeters.

Only one specimen of this species has been discovered, and this is a somewhat distorted cast from the reddish shales of the Laramie Group near its base. Neither the aperture nor the extremity of the beak is shown in the specimen, and I am not entirely satisfied that it belongs to the genus *Odontobasis*, but its general aspect and observable characters favor that reference, although it bears considerable resemblance to *Admetopsis* Meek, from the Cretaceous strata at Coalville, Utah. Perhaps a sufficient reason for referring this shell provisionally to *Odontobasis* is the fact that a species of that genus is already known in the Laramie Group, while no other genus is yet known there to which it could be confidently referred. Of the three other species of *Odontobasis* yet known, two are from the Fort Pierre Cretaceous Group, a true marine formation, and one from the Laramie Group, near Point of Rocks Station, Union Pacific Railroad, Wyoming, a brackish-water formation, and which is there associated with *Goniobasis insculpta* as well as *Ostrea* and *Anomia*. The genus *Admetopsis* is not yet known to exist in the Laramie Group, nor unassociated with true marine forms.

When other specimens shall have been discovered, it may prove that the description should be somewhat modified, but it is doubtless quite sufficient for the identification of the species.

As a rule, the molluscan remains of the Laramie Group indicate a brackish condition of the waters in which they lived. This species is associated with *Melania wyomingensis* Meek, which is necessarily re-

garded as a fresh-water shell, and is often found associated with other fresh-water forms, and also with *Nuculana*, which is now known only in marine waters. Its other associates are *Corbula*, *Corbicula*, and *Anomia*.

Position and locality.—Laramie Group, about 400 feet above its base, Danforth Hills, Northwestern Colorado. The locality is about 10 miles northeastward from White River Indian agency.

ART. XXIX.—PALEONTOLOGICAL PAPERS NO. 7: ON THE DISTRIBUTION OF MOLLUSCAN SPECIES IN THE LARAMIE GROUP.

By C. A. White, M. D.

The term Laramie Group is here used to include all the strata between the Fox Hills Group of the Cretaceous period beneath, and the Wasatch Group (=Vermilion Creek Group of King) of the Tertiary period above. That is, it includes, as either subordinate groups or regional divisions, both the Judith River and Fort Union series of the Upper Missouri River; the Lignitic series east of the Rocky Mountains in Colorado; the Bitter Creek series of Southern Wyoming and the adjacent parts of Colorada; and also the "Bear River Estuary Beds", together with the Evanston Coal series, of the Valley of Bear River and adjacent parts of Utah. Strata of this great Laramie Group are known to exist in other large and widely separated districts of the western portion of the national domain, but only those above indicated are especially noticed in this paper.

So far as the brackish-water mollusca of the Laramie Group have yet been investigated, they have proved, with few exceptions, to belong to types represented by living mollusks of similar habitat; and the fresh-water and land mollusks of that group of strata belong almost wholly, if not entirely, to types that are fully represented by living species. Therefore a mere similarity or even identity of molluscan types in the strata of the different regions just enumerated would not prove them to belong to the same epoch; but it is held that an identity of species does constitute such proof.

During the season of 1877 it was my good fortune to make considerable collections of fossils from all the forenamed regions except those of the Upper Missouri River. Study and comparison of my own collections with those made many years ago by Dr. Hayden from the Judith River and Fort Union beds in the Upper Missouri River region shows an intimate relationship to exist between the molluscan fauna of each of these series respectively. This fact is illustrated to some extent by the following table, which, however, includes only the species that have been discovered in the strata of more than one of the regions, or of the subor-

dinate groups, herein discussed. It is, therefore, by no means a summary of the invertebrate fauna of the Laramie period.

Table showing the Geographical Distribution of Species in the Laramie Group.

	Fort Union Group.	Judith River Group.	South Platte Valley.	Bitter Creek Series.	Yampa River Valley.	White River Valley.	Bear River Valley.
Ostrea wyomingensis Meek	.....	*?	*	*	*	*	.....
Anomia micronema Meek	.....	.....	*	*	*	*	.....
Anomia gryphorhynchus Meek	.....	.....	*	*	*	.....	.....
Brachydontes regularis White	.....	.....	*	*	*	*	.....
Unio cryptorhynchus White	.....	*	.....	*	.....	.....	.....
Corbicula (Leptesthes) fracta Meek	.....	.....	*	*	*	*	.....
Corbicula (Leptesthes) subelliptica Meek	.....	*	*	.....	.....	.....	.....
Corbicula (Veloritina) cytheriformis M. & H	.....	*	.....	*	.....	.....	.....
Corbicula (Veloritina) occidentalis M. & H	.....	*	.....	*	*	.....	.....
Corbula perundata M. & H	.....	*	*	*	*	.....	.....
Corbula undifera M. & H	.....	.....	.....	*	.....	*	.....
Bulinus longiusculus M. & H	.....	*	.....	.....	.....	.....	*
Bulinus subelongatus M. & H	.....	*	*	.....	.....	.....	*
Columna teres M. & H	.....	*	.....	.....	.....	.....	*
Macrocyclis spatiosa M. & H	.....	*	.....	.....	.....	.....	*
Goniobasis tenuicarinata M. & H	*	.....	*	.....	.....	.....	.....
Goniobasis gracilienta M. & H	.....	*	*	*	.....	.....	.....
Melania wyomingensis Meek	.....	.....	*	*	*	*	.....
Campeloma vetula M. & H	.....	*	.....	*	.....	.....	.....
Campeloma multilineata M. & H	*	.....	*	*?	.....	.....	.....
Tulotoma thompsoni White	.....	.....	*	*	.....	.....	.....

The underscore of the asterisk in the above table indicates the region in which the species thus designated was originally discovered. The double vertical line may be taken to represent the Rocky Mountains, or the great range, extending northward through Colorado, Wyoming, and Montana; the localities named on its left being east, and those on the right, west of those mountains.

The region indicated in the table as "South Platte Valley" embraces quite a large area east of the Rocky Mountains in Colorado, which is drained by the South Platte and its tributaries, and extends eastward from the base of the mountains out upon the plains, a known distance of 150 miles, and doubtless much further.

The Bitter Creek series, as here indicated, embraces all the strata that were included by Mr. Meek under the same designation in Hayden's Sixth Annual Report of the Geological and Geographical Survey of the Territories. Those of the well-known localities, Rock Springs and Black Buttes Stations, are both included in this series, and not regarded as separate, as they were in one of my former publications (Geology of the Uinta Mountains, Chapter III). The Yampa and White River Valleys are adjacent regions west of the Rocky Mountains, in Northwestern Colorado.

The strata here included under the head of "Bear River Valley" are

those that have been frequently designated as the "Bear River Estuary Beds", and sometimes as the "Sulphur Creek Estuary Beds"; together with the coal-bearing series that is seen to rest upon them in the Valley of Bear River, northward from Evanston, Wyoming.

It will be seen that *Ostrea wyomingensis* is indicated with doubt as occurring in the Judith River Group. This reference is made because of the probable identity of *Ostrea glabra* Meek & Hayden, with *O. wyomingensis* Meek, and the doubt is expressed because the proof upon that point is not entirely satisfactory. The former species, as identified in the Lignitic strata east of the Rocky Mountains in Colorado, is there found to be connected by associated intermediate forms with shells that cannot be distinguished from the typical forms of *O. wyomingensis*, and therefore no doubt is expressed upon that point as regards that region. This species is not only found in the strata of the other regions indicated in the table, but in various localities within the great Green River Basin west of the Rocky Mountains it is found to range through the whole series of Laramie strata, a thickness of not less than 3,500 feet. I am also a little in doubt as to the real identity of *Campeloma multilineata* in the Bitter Creek series; but all the other species embraced in the table are probably correctly identified. Not only has the *Ostrea wyomingensis* the great vertical range in the Laramie Group which has just been mentioned, but *Anomia micronema*, *Brachydontes regularis*, *Melania wyomingensis*, and probably other species also, have an equally great vertical range; embracing, in fact, the whole thickness of the Laramie strata in the great Green River Basin, which thickness probably reaches a maximum of 4,000 feet.

It is a well-known fact that the aggregate thickness of the Laramie strata east of the Rocky Mountains in Colorado is much less than it is in either of the other regions here named. But those eastern strata *appear* to represent the whole Laramie period, because they contain all the species just mentioned that are known to range through the whole series west of the mountains, where it has its maximum thickness, and they also contain certain species associated in the same layers that appear to characterize the Fort Union and Judith River beds respectively, in the Upper Missouri River region, and not there associated together in either.

The distribution of species in the Laramie Group, on both sides of the Rocky Mountains, is too conspicuously shown by the table to need comment.

In the foregoing discussion only the species that are common to the strata of two or more of the districts here discussed have been considered. Therefore, only the faunal relationships between these regions, and not their differences, are shown. To show the latter, a consideration of all the species yet discovered in the strata of this great group is necessary. The characteristics of all the known species of the districts named, except a part of those of Bear River Valley, are in har-

mony with the close faunal relationship, which is shown to exist, by the few species that are named in the table.

The brackish-water branchiferous species, however (as well as the pulmonate *Rhytophorus priscus* Meek), of the Bear River Valley series, are not only of different species from any that occur in any other strata of the Laramie Group, but a part of them are of different types also. It is also true that these brackish-water species depart more widely from living types than do any of the species of other portions of the Laramie Group. In fact, not one of the species yet found in the true brackish-water strata of the Bear River series has been identified in those of any of the other regions discussed in this paper; and the evidence of the faunal relationship of this portion of the Laramie Group with the others, which is shown in the table, is confined to pulmonate mollusks alone. It is true also that the pulmonate mollusks of the Bear River Valley series that have been identified with species found in Laramie strata in other districts are apparently confined to the Evanston coal-bearing beds that overlie the portion of the series in the Bear River Valley which contains the brackish-water types. The fact that these pulmonate species of the Evanston coal-bearing beds have also been found only in the Judith River series, which probably represents the lower or earlier portion of the Laramie Group, seems to indicate that the Bear River series of brackish-water strata is still older. But this is not necessarily the case, for there is apparently no reason why we might not expect to find those species to range through the whole Laramie series, as other species have been shown to do. In other words, from our present knowledge of the facts, it appears justifiable to regard the Judith River beds as representing the earlier and the coal-bearing beds near Evanston as the later portion of the Laramie period.

It now seems probable that we must look for the cause of the differences which the branchiferous mollusks of the strata of the Bear River Valley present, from all other portions of the Laramie Group, in a difference of physical conditions probably induced by the proximity of the western shore-line of the great Laramie inland sea; conditions that induced differential changes in the aqueous mollusks, but not thus affecting the land and palustral pulmonates.

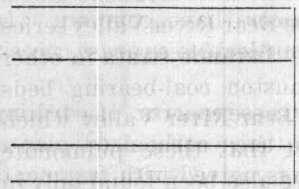
In subsequent papers, it is proposed to discuss the relations of the Laramie Group with those above and beneath it; and also the relations of its molluscan types with those of other fossil, and also with those of existing forms.

ART. XXX.—ON SOME DARK SHALE RECENTLY DISCOVERED BELOW THE DEVONIAN LIMESTONES, AT INDEPENDENCE, IOWA; WITH A NOTICE OF ITS FOSSILS AND DESCRIPTION OF NEW SPECIES.

BY S. CALVIN,

Professor of Geology, State University of Iowa.

The Devonian deposits of Iowa, as now known, may be roughly represented by the annexed diagram, in which 1



indicates the position of a member of the group recently discovered at Independence, consisting of dark argillaceous, with some thin beds of impure, concretionary limestone. It has been explored to a depth of 20 or 25 feet. No. 2 represents all the beds of what have been termed Devonian limestones in Iowa, and is made up largely of limestones, with associated beds of light-colored shales; estimated thickness, 150 feet. No. 3 is a bed of argillaceous shales exposed at and near Rockford, Iowa, and is referred to in this paper as the Rockford Shales. It abounds in fossils, and weathers, on exposure, into a stiff clay, that has been utilized in the manufacture of brick; observed thickness, 70 feet.

Until quite recently, Nos. 2 and 3 of the above section were supposed to make up the entire thickness of Devonian rocks in Iowa. No. 2 not only varies, as already indicated, in lithological characters, but the grouping of fossils differs widely in different localities, so much so that competent geologists have referred certain exposures—for example, those at Waterloo—to the Corniferous, and others—as at Independence and Waverly—to the Hamilton. Such references of the above-named exposures will be found in the Twenty-third Report on the State Cabinet of New York, pp. 223–226; and in the same article Professors Hall and Whitfield declare the Rockford shales to be the equivalent of the New York Chemung. On the other hand, Dr. C. A. White—Geology of Iowa, 1870, vol. i, p. 187—is of opinion that all the Devonian strata of Iowa belong to a single epoch.

Thus matters stood until about a year or so ago, when D. S. Deering called attention to the interesting fact that a dark shale had been exposed in working out the layers in the bottom of one of the limestone quarries near Independence. The quarrymen penetrated the shale to a considerable depth in the hope of finding coal. The shale varies somewhat lithologically, but where it presents its most characteristic features it is argillaceous, fine-grained, and highly charged with bituminous

matter. In some of the beds there are numerous remains of plants—stems of *Lepidodendron* and *Sigillaria* that made up the forests of the Devonian. The plants, however, are very imperfect; the form only is partially preserved, and that mainly by iron pyrite that replaced the original stem. The woody tissue of the plants has been converted into coal that occupies thin, irregular seams among the laminæ of pyrite. The little bands of coal vary in thickness, but none of those observed exceed a quarter of an inch. None of the plants are perfect enough to render either generic or specific identification possible.

The discovery of shale charged with the carbonized stems of plants below the Devonian limestone of Iowa is a matter of much interest. Frequent reports have gained circulation of the discovery of coal in drilling wells in regions occupied by Devonian rocks. From Jesup, Janesville, Marion, Davenport, and other places, such rumors have gone out. In one or two cases, shafts have been dug at considerable expense, necessarily ending in disappointment and failure.

The discovery at Independence accounts for these reports. In drilling through the limestones, the lower shales, with their carbonized plants, were reached, and the dark color of the borings, mixed with fragments of real coal, naturally enough gave rise to the impression that a veritable coal-mine had been found.

It is to be noticed that all the places from which such reports have come stand near the eastern outcrop of the Devonian, where its entire thickness could be pierced at a very moderate depth. The number and position of such localities would show that the shale in question is not a mere local deposit, but is distributed all along the outcrop of Devonian rocks in Iowa.

The researches of Mr. Deering and myself have brought to light quite a number of finely preserved Brachiopods, representing fourteen species. Of these, two are not determined and five are new to science; but the chief interest attaches to certain species that have hitherto been known only from the shales of bed No. 3, near Rockford. It will be convenient to arrange the specimens in three groups as follows:—

I. Species limited in Iowa, so far as known, to the Independence shales: *Strophodonta variabilis*, n. s.; *Gypidula munda*, n. s.; *Orthis infera*, n. s.; *Rhynchonella ambigua*, n. s.; *Spirifera subumbona*, Hall (?).

II. Species ranging throughout the entire group, and so common to beds 1, 2, and 3: *Atrypa reticularis*, Linn.

III. Species common to beds 1 and 3, but not known to occur in the intervening limestones: *Strophodonta quadrata*, n. s.; *S. arcuata*, Hall; *S. canace*, Hall & Whitfield; *S. reversa*, Hall; *Atrypa hystrix*, Hall;* and *Productus* (*Productella*) *dissimilis*, Hall.

*The form designated here as *A. hystrix*, Hall, differs conspicuously from that described in Geology of Iowa, 1858, vol. i, part 2, p. 515, under the name of *A. aspera* var. *occidentalis*. This last occurs abundantly in the overlying limestones. The specimens from the lower shales are identical with the form presented by this *Atrypa* in the Rockford shales. For application of this specific name to this special form, see 23d Annual Report of Board of Regents on New York State Cabinet, p. 225.

It is an interesting fact that of the twelve determinable species six occur only in the shaly deposits at the opening and close of the Devonian, notwithstanding these deposits are separated by 150 feet of limestone. Only one species is known to pass from the lower shales into the limestones above, and even there it appears under a form so altered that specimens from the two beds may be distinguished as readily as if they were distinct species. If we take form and surface-markings into account, the *Atrypa reticularis* of No. 1 also finds its nearest representative, not in the limestones immediately above, but in the shales at Rockford.

Obviously, then, the Independence shales are more nearly related to the Rockford beds than to any other formation in Iowa. The species in Group I seem to have disappeared with the ushering-in of conditions under which limestones were formed; they maintained themselves in some locality which has not been discovered, or from which the shaly deposits have been entirely swept away, and returned with the return of conditions favorable to their existence during the deposition of the Rockford shales.

The intimate relation between the two extremes of the group is certainly a most interesting one, and can but strengthen the conclusion of Dr. White, that all the Devonian strata of Iowa belong to a single epoch.

Brachiopods of the Independence Shale.

STROPHODONTA VARIABILIS, n. s.

Shell small, very variable, thin, orbicular to semi-oval in outline. Valves in some instances about equally convex, in other cases, notably in young specimens, the dorsal valve has the greater convexity, the ventral being flat or even slightly concave; again the ventral valve may be regularly convex, the dorsal being concave, or the dorsal valve may be convex near the back, becoming deeply concave toward the front margin.

Hinge-line straight; cardinal extremities often produced, but more frequently rounded in adult individuals. Hinge-area common to both valves, narrow, a little wider on the ventral, marked by a few strong vertical striæ corresponding to the deep crenulations of the hinge-line.

Surface marked by fine radiating and alternating striæ, which are strongly curved on the cardino-lateral areas and increase by implantation. Fascicles, of from 4 to 7 minute, low, rounded striæ, occur between each pair of larger, angular, and much more prominent ones. An imperfectly defined mesial fold sometimes seen on ventral valve. Striæ crossed by very minute, microscopic, concentric lines.

Muscular scars of ventral valve broad, short, and sharply defined by an elevated ridge. Cardinal process of dorsal valve bifid, the diverging parts slender, emarginate at tip, and fitting into notches in area of ventral valve. Entire inner surface granulose. Vascular markings obscure, except near the margin.

Length, 12; width, 15; thickness, 4 millimeters.*

Known only from the Independence shales.

STROPHODONTA QUADRATA, n. s.

Shell small, concavo-convex, quadrate in outline. Cardinal extremities sometimes abruptly produced, sometimes rounded. Ventral valve very convex, flattened on the umbo, and descending abruptly to the lateral and front margins. Dorsal valve concave, following closely the curvature of the other. Hinge-area common to both valves, wider on ventral, finely striated. Foramen only sufficiently developed to receive the extremities of the bifid cardinal process. Muscular scars faintly impressed, not definitely bounded.

Surface of ventral valve ornamented by fine radiating striæ. From 3 to 5 very small striæ are implanted between pairs of more prominent, but very slender, filiform, and often slightly interrupted ones. A broad, shallow, mesial sinus sometimes occupies the front half of the valve. On dorsal valve, the striæ are subequal, corresponding to the finer ones of the ventral.

Length, 9; width, 11; convexity, 5 millimeters.

Occurs both at Independence and Rockford.

STROPHODONTA ARCUATA, Hall.

Strophodonta arcuata, Hall, Geology of Iowa, 1858, vol. i, part 2, p. 492, plate iii, fig. 1 *a*, *b*, *c*, and 2 *a*, *b*.

Very common in the Rockford shales, and is also found at Independence.

STROPHODONTA CANACE, Hall & Whitfield.

Strophodonta canace, Hall & Whitfield, 23d Ann. Report on State Cab. of New York, p. 236, pl. xi, figs. 8–11.

The specimens in hand present some differences from the Rockford forms. Other specimens from Independence show more exact agreement.

STROPHODONTA REVERSA, Hall.

Strophodonta reversa, Hall, Geology of Iowa, 1858, vol. i, part 2, p. 494, pl. iii, fig. 4 *a*, *d*.

From Independence. Also found at Rockford, where this species is very abundant.

ORTHIS INFERA, n. s.

Shell very small, orbicular or subelliptical; valves about equally convex. Ventral valve regularly convex, with a slight indication of a mesial fold; beak prominent, erect or slightly incurved; hinge-line short, length about equal to a third of the width of shell near the middle; hinge-area narrow.

*All the dimensions given in this paper are taken from average-sized specimens, unless otherwise stated.

Dorsal valve convex, with a fairly defined mesial sinus that is wide in front and narrows rapidly toward the beak; beak only a little less prominent than on ventral valve. Surface of both valves marked by from 24 to 30 moderately strong, rounded striæ that are separated by wide furrows and multiply by bifurcation on the front half of shell. Striæ and furrows crossed by very minute microscopic lines.

Length, 6; width, 7; thickness, 3½ millimeters.

Known at present only from the dark shales at Independence.

ORTHIS, sp. ?

The surface is marked by coarse, angular striæ, and a sharp angular mesial ridge gives the valve a carinated appearance. From the Independence shale.

SPIRIFERA SUBUMBONA, Hall.

Spirifera subumbona, Hall, Pal. N. Y. vol. iv, p. 234, pl. 32, figs. 22–30.

The specimens under consideration agree very well in most characters with some forms of *Spirifera subumbona*, but, as will be seen from the figures, they differ materially in size and in the width of the hinge-area. Not known to occur in Iowa except in the Independence shales.

ATRYPA HYSTRIX, Hall.

Atrypa hystrix, Hall, Pal. N. Y. vol. iv, p. 236, pl. 53, A, figs. 15–17.
A. hystrix, H. & W., 23d Annual Rept. N. Y. State Cabinet, p. 225.
(See note at bottom of p. 726 of this Bulletin.)

The specimen in hand was collected at Independence.

ATRYPA RETICULARIS, Linn.

Atrypa reticularis of authors.

The specimens collected represent the prevailing type as this species occurs in the lower shale at Independence. It is more nearly related to Rockford forms than to the forms found in the limestones only a few feet above.

RHYNCHONELLA AMBIGUA, n. s.

Shell large, transversely oval or elliptical; valves moderately gibbous, subequally convex; mesial fold and sinus broad and well developed at the anterior margin in full-grown shells, becoming obsolete toward the umbonal region. Length and width in about the ratio of 3 to 4. Ventral valve regularly arched in the posterior part; the middle of the anterior half of the valve occupied by a broad sinus, which becomes deep and subangularly margined toward the front. A strong fold, extending about a third of the way to the beak, occupies the middle of the sinus; rudimentary folds appear on either side of the middle in the sinus of large shells. Beak of ventral valve projecting slightly beyond the other, closely incurved and appressed so as to show neither area nor

foramen in perfect adult shells. Dorsal valve convex; greatest convexity near the umbo, from which it slopes gradually to the lateral and antero-lateral margins. Mesial fold confined to anterior half, broad and high in front, and divided in the middle by a wide, longitudinal, subangular furrow; rudimentary furrows on either side of the middle. Both valves with three or four plications on either side of mesial fold and sinus in adult shells; plications confined to antero-lateral margins. Postero-lateral margins and umbonal region smooth. Shell thin, translucent, scarcely fibrous.

Dimensions of a large specimen are: Length, 28; width, 41; thickness, 23 millimeters.

Confined, as far as known, to the dark shales at Independence.

GYPIDULA MUNDA, n. s.

Shell small, subtriangular to broadly ovate, inequivalve; ventral valve convex, curving almost regularly from beak to front margin; beak only moderately prominent, obtuse, slightly incurved; an indistinct mesial fold near the front margin. Dorsal valve transverse elliptical in outline, slightly convex near the beak, sloping at first somewhat abruptly and then more gradually toward the cardino-lateral margins; a broad sinus, of which the middle is occupied by a single low fold, is confined to the anterior margin. A few indistinct folds occupy the antero-lateral margins of both valves; surface otherwise smooth.

Area and foramen as in other species of this genus.

Length, 8; width, 10; thickness, 6 millimeters.

This species resembles *Gypidula occidentalis*, Hall, from which it may be distinguished by its smaller size, less prominent beak, greater proportionate width, and deeper sinus. The young *G. occidentalis* of corresponding size are entirely smooth, and show no trace of either fold or sinus. They differ also from *G. munda* in form and general proportions.

From the dark shale at Independence. The species is unknown from any other horizon.

PRODUCTUS (PRODUCTELLA) DISSIMILIS, Hall.

Productus dissimilis, Hall, Geology of Iowa, 1858, vol. i, part 2, p. 497, plate iii, fig. 7 *a–c*.

This species is abundant at Rockford, and is among the most common species in the Independence shales.

PRODUCTUS (PRODUCTELLA) sp.?

The collections from the Lower Devonian Shales contain a few specimens of this small *Productus*. It is somewhat related to *P. Shumardianus*, Hall. More material will be necessary before it can be determined.

ART. XXXI.—ON THE MINERALOGY OF NEVADA.

By W. J. Hoffman, M. D.

This report is based primarily upon the collection made in 1871 while a member of the expedition for the exploration of Nevada and Arizona.* Since that time I have received well-authenticated species from various sources, chiefly in Nevada; and those which have not come under my personal observation have been accredited to the proper authorities. The original collection is now at the National Museum, excepting in a few instances, in which the materials were consumed in making the necessary analyses. The only interesting feature which I shall mention here is the occurrence of manganiferous compounds in a belt of limestone, chiefly traceable from Austin south, and eastward toward Hot Spring Cañon. Most of the compounds containing antimony in various forms occur chiefly throughout the western portion of the State, while in the eastern portion the haloid compounds predominate. Neither of these, however, are in any way governed by the occurrence of so-called "sulphuret ores", as these are distributed pretty generally.

In addition to the above, a few remarks upon, and a list of, the thermal and mineral springs visited are added; also notice of some of the rarer minerals found in Owens Valley, California.

I embrace this opportunity of acknowledging my indebtedness to the following-named gentlemen for information and specimens which I could not have obtained through any other sources: Mr. Julius Partz, superintendent and afterward assayer of the mines in Blind Springs District, California; Mr. Richard Stretch, formerly engineer of the Virginia City Mines; Mr. Leon and the Canfield Bros., Belmont; the Messrs. Ogden, of Morey; Thomas Shaw, Gold Mountain; and Mr. W. S. Keys, superintendent of the Eureka Consolidated Mines. Dr. A. E. Foote, of Philadelphia, Pa., furnished me with several names, to which (when not on my list) his name has been appended as authority. In several instances, also, I have quoted from Professor Dana's Manual of Mineralogy for localities unknown to me personally. The localities cited are those in which the specimens named occur or did occur in their greatest purity or finest crystallizations.

Agate. See *Silica.*

Albite. In rhyolite, at Eureka and at Morey; massive, granular, at various points in Fish Lake Valley, rarely in crystals. Fine crystals in trachyte on the Colorado River.

* Now known as United States Geographical Surveys West of 100th Meridian.

Allemontite. Locality unknown. Also reported by Dr. Foote. (Pri. com.)

Alum. See *Kalinite.*

Alunogen. At Mount Diablo, associated with kalinite.

Amethyst. On the mesa, near the mouth of Rio Virgen.

Analcite. In small crystals in the La Libertad Mine, San Antonio District. In amygdaloid in the Black Cañon, Colorado River.

Anglesite. Occurs sparingly in Railroad District, at Hyko, and at Mineral Hill. Across the State line at Partzwick, Cal., crystals were obtained measuring .34 of an inch across.

Ankerite. Occurs southeast of Camp Halleck. Locality unknown.

Sp. gr.= 2.975.

Composition:	
Carbonate of lime	51.14
Carbonate of magnesia	23.48
Carbonate of iron	18.75
Carbonate of manganese	6.20
Organic matter	0.43
	100.00

Antimony. See *Stibnite.*

Apatite. In small crystals, with good terminations, at Lone Mountain.

Aragonite. Crystals nearly one inch in length, with perfect terminations, in a cave one mile south of Mineral Hill. The variety known as *Flos Ferri* occurs in small quantities.

Argentite. In small quantities in Cope and Bull Run Districts. Sparingly at Mineral Hill and Hyko; more frequent at Palmetto.

Arsenic. Antimonial arsenic, 17[a]. A compound, consisting of arsenic, 90.82, and antimony, 9.18, (=17 As + 1 Sb), occurs in the Comstock lead of the Ophir Mine, Washoe County, "Cal." (*i.e.*, Nevada), in finely crystalline, and somewhat radiated, reniform masses, between tin-white and iron-black on a fresh fracture, but grayish black on tarnishing, unassociated with arsenolite, calcite, and quartz.*

Arsenolite. Ophir Mine. (Dana and Stretch.) Sparingly, in small quantities, at Belmont.

Astrophyllite. Rare, in small hexagonal laminæ, at Silver Peak.

Alunogen. Near Mount Diablo, frequently associated and mixed with sulphur. Dr. Loew mentions this as occurring thirty-five miles northwest of Silver Peak, having reference undoubtedly to the same locality.

Azurite. Occasionally in minute crystals at Bull Run; in thin coatings and seams at Hyko and Cope District; rather more frequent at San Antonio, Montezuma, and Philadelphia Districts. In beautiful crystals at Mineral Hill.

Beryl. Sparingly, ten miles north-northwest of Silver Peak. Some crystals have been obtained, the largest measuring .75 of an inch across. Color dull bluish-ash.

*Dana's Manual of Mineralogy, New York, 1868, p. 18.

Biotite. In fine crystals at Silver Peak; also in the cañon about ten miles west of Palmetto.

Borax. In moderately sized crystals in the desert south of San Antonio; Death Valley.

Bornite. Sparingly in Galena and Railroad Districts.

Borono-calcite. Hot Springs. (Loew.)

Bournontite. Accompanies silver-ores at Lone Mountain.

Bromid of silver. See *Bromyrite.*

Calcite. In simple and modified rhombohedra, four inches in length, at Bull Run. Smaller crystals, occasionally scalenohedra, at Reese River. At Morey acute rhombohedra occur of various shades of pink, often rose-colored, where they are frequently associated with rhodocrosite. Two analyses show great variation of composition, although they did not exhibit any perceptible difference in measurement or coloration. No. 1 was taken from the extreme northeastern portion of the mine, and No. 2 about twenty yards southwest of that locality.

	No. 1.	No. 2.
Carbonic acid	53.74	52.36
Manganous oxide	3.87	4.97
Ferrous oxide	trace	0.21
Lime	42.28	41.42
Silicic acid	—	0.97
Loss	0.11	0.07
	100.00	100.00

These samples contain a large quantity of carbonate of manganese, but the calcite, wherever it appears in the region between Morey and Austin, contains more or less, frequently so much so as to present the characteristic tints; these, however, may to some extent be due to the presence of iron.

One mile south of Mineral Hill, in a cave, occur the following varieties:—

a. Rarely, small flat rhombohedra, with the lateral angles removed, known as nail-head spar;

b. Small scalene dodecahedra;

c. Fine aggregations of acute rhombohedra; and

d. Drusic and acicular incrustations and clusters, assuming great varieties of form.

Some of the acicular crystals measured nearly three-fourths of an inch in length, and occurred radiating from various places from the roof of the cave.

Carbonate of copper. See *Malachite.*

Carbonate of iron. See *Siderite.*

Carbonate of lead. See *Cerussite.*

Carbonate of lime. See *Calcite.*

Carbonate of manganese. See *Rhodocrosite.*

Cassiterite. The only locality where stream tin was found to occur is at the Tuscarora placer mines. Small crystals are occasionally met with.

Cerargyrite. Frequently met with in the Comstock Mine; rarely at Montezuma; in small pale brown and greenish-brown crystals at San Antonio; in fine cinnamon-brown crystals at Belmont, Philadelphia Mine; also sparingly at Bull Run; more frequent at Pioche, Reese River District, White Pine District, and at Columbus.

Cerussite. In drusic incrustations on galenite at Bull Run; massive, of dirty-white and yellowish-gray colors, in Pinto District. Occurs in elongated six-rayed crystals at Hyko. Associated with and coating clusters of crystals of anglesite at Eureka.

Cervantite. Massive and in minute crystallized coatings, sparingly, with stibnite, west of Battle Mountain.

Chalcedony. See *Silica.*

Chabazite. In small but fine crystals in La Libertad Mine, San Antonio District. Many of these crystals were coated with smaller crystals of cerargyrite.

Chalcocite. Common at Reese River District. It is said to occur with the sulphuret ores throughout the State, but the specimens received from various contributors were not labeled. Professor Dana mentions it as occurring in Washoe, Humboldt, Churchill, and Nye Counties.*

Chalcopyrite. Massive in Galena District; associated with pyrite and galenite in Railroad District.

Chalcotrichite. Sparingly in Galena District, with the ordinary crystals of cuprite, of which it is a variety.

Chrysolite. Specimens said to be from this State in Captain Rabbitt's collection at Palisade; locality unknown. Dr. A. E. Foote informs me likewise of its occurrence in Nevada.

Cinnabar. Massive, occasionally in minute acicular coatings, at Steamboat Springs. (Partz.)

Citron stone. See *Silica.*

Coal. See APPENDIX A.

Copper. Occurs in thin, arborescent leaves or sheets at Bull Run, Battle Mountain District; sparingly at Eureka and Belmont. More frequent at Galena District, where crystals of cuprite have been obtained containing minute filaments of native copper.

Corundum. Impure columnar fragments, sometimes nearly an inch in diameter, at Silver Peak.

Cuprite. In cubes, sometimes measuring .5 of an inch across, having truncated edges; twin crystals, tabular, at Galena District; frequent occurrence of fibers of native copper protruding from one or more faces of a crystal.

Datolite. In small crystals at Montezuma, Silver Peak, and Gold Mountain.

*System of Mineralogy, etc., J. D. Dana, New York, 1868, p. 53.

Diallogite. Occasionally found at Morey, where it accompanies calcite and rhodocrosite; rarely at Reese River.

Dolomite. Is found in various portions of the limestone formations, although sometimes rarely in crystals. The variety known as *pearl spar* occurs in moderately sized crystals twenty miles south of Eureka.

A ferriferous variety, usually known as brown spar, occurs in the eastern portion of the State (exact locality unknown). This was supposed to contain a large percentage of chloride of silver, the finders arriving at this conclusion by its grayish-brown color alone. Crystals occur of from two to three inches in length. An examination of one of the samples resulted as follows:—

G. = 2.92.

Carbonate of lime	55.38
Carbonate of magnesia	39.90
Carbonate of iron	3.03
Carbonate of manganese	1.64
	99.95

Another variety found in the same region is undoubtedly *ankerite* (*q. v.*).

Embolite. In small quantities at Bull Run, Cope, and Eureka Districts; more abundant at Mineral Hill, San Antonio, Belmont, Montezuma, Palmetto, and Hyko.

Epidote. Locality unknown.

Feldspar. See *Orthoclase.*

Flint. See *Silica.*

Fluorite. In small green crystals in the White Mountains, near the dividing line between Nevada and California, west of Columbus.

Frieslebenite. Belmont. (Loew.)

Galenite. In large quantities and frequently of large cubic forms in Galena District; in cubes and dodecahedra at Reese River; a crystal of the latter variety measured over two inches in diameter. Massive and associated in moderate quantities with silver-ores in nearly all the districts to a greater or less extent.

The following varieties are found in more decided quantities in the following-named districts:—

a. Argentiferous: rarely at Belmont and Hyko; sparingly at Bull Run, Mineral Hill, and Silver Peak; abundant at Battle Mountain and Galena Districts. An exceedingly rich variety occurs sparingly four miles west of Gold Mountain.

b. Auriferous: sparingly but very rich at Silver Peak.

Garnet. Good crystals, but very small, from the Black Cañon, Colorado River. Impure, fractured crystals, nearly one and a half inches in diameter, occur.

Gay-Lussite. Sparingly in the dry soil of Fish Spring Valley.

Gold. Occurs granular, laminated, in quartz, and sometimes in tolerably large nodules in the placer mines at Tuscarora. Much of the larger sized are porous or cellular; one specimen of this character, measuring two inches in length, one in width, and over half an inch in thickness, was worth but $11.50. The outer surface was worn smooth, giving it the appearance of a solid nugget.

At Silver Peak, in quartz; sometimes in delicate arborescent forms, sometimes resembling frost-work in construction; also occurs in galenite (*q. v.*).

At Gold Mountain in metamorphic rocks. Frequently in variously tinted quartz. One fiber was found to run clean through a small nodule of malachite, and resembled native copper in its filiform variety. Five miles northwest of Gold Mountain, in the "State Line Ledge", is an exposure of auriferous quartz, 20 feet thick and over 2,000 feet in length, running northwest and southeast. Mr. Shaw, of Gold Mountain, stated that an analysis gave about $20 per ton of ore! At the same time he was one of a party of three who were contented, apparently, in working "ten-dollar ore".

The total absence of water may account for their not having worked this quartz.

In Green Mountain District, at the head of Tule Cañon, gold was found in the sand in large coarse grains.

Gold is found in many of the silver-ores throughout the State, in various quantities, but seldom sufficient to work it to the exclusion of silver.

Graphite. Ten miles northwest of Gold Mountain.

Gypsum. See *Selenite.*

Halite. In small crystals in the desert south of Columbus; in fine tabular crystals and cubes in the salt marsh near Silver Peak; in large cubes, crusts, and efflorescences in Death Valley; as an efflorescence on the banks of Rio Virgen, Black Cañon, Colorado River, and in Diamond Creek on the Arizona side of the Colorado. In large masses and cubes at Hyko; abundant at Salt Mountain, near Rio Virgen, in the southern part of the State.

Halotrichite. Locality unknown.

Hematite. Ocherous and porous at Lone Mountain. Sparingly at Bull Run and Morey. Occurs in Virgin Cañon, Colorado River, frequently associated with small quantities of the carbonates of copper. Eighteen miles southeast of Silver Peak in occasional croppings.

Hornblende. Found in small crystals at Gold Mountain. In rhyolite at Carlin, Eureka, and near Morey. Ten miles west of Mount Magruder in fine crystals.

Hübnerite. In fine columnar masses from the White Mountains. Austin.

Iodide of silver. See *Iodyrite.*

Iodyrite. In minute cubes, coating quartz and argentite, from Reese River District; sparingly at San Antonio; White Pine.

Jamesonite. Humboldt County. (Dana.)

Jasper. See *Silica.*

Kalinite. Massive and columnar, sometimes crystallized, at Mount Diablo. Specimens frequently contain small quantities of sulphur, through liquid infiltration.

Kermesite. Was reported from Eureka, which is undoubtedly an error. It was found very sparingly in Blind Spring District, California, just across the line from Columbus, during the earlier stage of development of the mines.

Küstelite. Is an auriferous silver, of a silver-white color, somewhat darker than native silver on a fresh surface. Contains silver, lead, and gold, the first much predominating. From the Ophir Mine, according to Dana.* Occurs in bean-shaped grains.

Lead (Arsenate of). See *Mimetite.*

Lead (Carbonate of). See *Cerussite.*

Lead (Molybdate of). See *Wulfenite.*

Lead (Phosphate of). See *Pyromorphite.*

Lead (Sulphate of). See *Anglesite.*

Lead (Sulphuret of). See *Galenite.*

Limonite. Lone Mountain. Is also found in many of the silver-mines.

Magnetite. In considerable quantities in Railroad District; also at Morey.

Malachite. Massive; incrustations and mammillary concretions in Copper Cañon, Galena District. Sparingly at San Antonio, Montezuma, and Belmont; more abundant at Mineral Hill.

Manganite. In small crystals, filling cavities in the limestone at Morey Mines.

Massicot. Galena. (Loew.)

Menaccanite. In propylite at and near Carlin; Eureka; Morey; Belmont.

Mica (Common). See *Muscovite.*

Mica (Brown). See *Phlogopite.*

Mimetite. Sparingly at Eureka.

Minium. Specimens exhibited to me as from Eureka were undoubtedly obtained, originally, at Blind Spring District (Rockingham Mine), California. Attempts at deception are frequently made for the purpose of making sales of specimens from so-called new localities. Found at Pioche. (Loew.)

Mispickel. At Morey, very rarely.

Moss agate. See *Silica.*

Muscovite. Found in small pieces at Carlin and Tuscarora. In fine laminæ at Silver Peak; at Eureka, Morey, and at Belmont in rhyolite. Also in the Black Cañon on the Colorado River.

* Manual of Mineralogy, New York, 1868, p. 9.

Mysorin. Very sparingly in the La Libertad Mine at San Antonio. The quantity of material at hand for thorough determination was scarcely sufficient. The analysis, however, nearly corresponds with composition as given by Thompson (quoted by Dana, p. 715); likewise the absence of water. Differs from malachite in color and hardness, being more of reddish or brownish green, and somewhat softer. In taking the general imperfect result, it is safe to say that it approaches mysorin nearer than any other known compound.

Natrolite. Locality unknown.*

Nitre. Silver Peak. (Dana.)

Obsidian. See *Silica.*

Orthoclase. In fine blue and flesh-colored crystal in Fish Lake Valley; also at Palmetto and Gold Mountain. In small crystals in the Black Cañon.

Phlogopite. In the mountains between Silver Peak and Alida District, near the trail. Small specimens were obtained south of the mining camp at Montezuma.

Polybasite. Reese River District and at Morey.

Psilomelane. At Austin, and in less quantity at Morey.

Proustite. Reese River District. Sparingly at Morey.

Pyrargyrite. Massive, and in small crystals at Austin.

Pyrite. In cubes with tetrahedryte in Galena District. In quartz, with galenite at Cope, Belmont, and Morey.

Pyrolusite. Occurs with other manganese ores at Reese River Mines and at Morey.

Pyromorphite. Found sparingly in Bull Run, Railroad, and Gold Mountain Districts.

Quartz. See *Silica.*

Rhodocrosite. Massive and crystallized at Morey; less common at Austin.

Salt. See *Halite.*

Sanidin. Occurs in rhyolite from Carlin southward to Eureka; at Bill Williams's Mountain, Arizona, it occurs in beautiful, moderately sized crystals in trachyte.

Scheelite. Sparingly, with hübnerite, in the White Mountains; has also been observed in minute crystals from Austin.

Scolecite. Locality unknown (Foote, MS.). Story County (Dana).

Selenite. Small crystals in clusters and aggregations at Mineral Hill, Eureka, Montezuma, and San Antonio. Sparingly, in crystals half an inch in length, at Belmont. Fine large crystals from Death Valley, especially that portion near the Old Spanish Trail.

Selensulphur. Occurs sparingly at Mount Diablo. A specimen of kalinite half an inch through was coated with a semi-crystalline layer of sulphur on one side, and with a layer of dark orange colored selensulphur on the other.

* Dr. A. E. Foote, in a private communication.

Serpentine. Eight miles west of Palmetto Cañon; also in Darwin Cañon.

Siderite. At Bull Run, in small crystals. Poor specimens were obtained in the White Mountains.

Silica. *a.* Crystallized, at Tuscarora, where it frequently occurs in geodes, at San Antonio and Belmont. Crystals with double terminations at Gold Mountain. Small green crystals at Reese River, San Antonio.

b. Rose quartz, at Tuscarora, Morey, Carlin, and Silver Peak.

c. Citron stone, at Tuscarora, Gold Mountain, and in Palmetto Cañon.

d. Agate, abundant at Tuscarora, San Antonio, in Fish Spring Valley, and on the mesa west of the mouth of Rio Virgen.

e. Chalcedony, at Tuscarora, San Antonio, Eureka, and Virgen River mesa.

f. Amethyst, in small crystals, in geodes, at Tuscarora.

g. Opal, in magnificent colors, with silicified wood. In breaking some of the large trunks at San Antonio, fine specimens were obtained; occurs also at Tuscarora.

h. Carnelian, in pebbles and lumps (averaging about the size of a common walnut), of all shades, from a pure white to dark reddish-brown, on the Virgen River mesa.

i. Onyx, occasionally found in the same locality.

j. Sardonyx, same as the last.

k. Aventurine quartz, found on the mountain-slope east of Fish Spring Valley.

l. Milky quartz, on the Virgen River mesa, though very seldom.

m. Prase, on the mountains near Silver Peak mining-camp, rarely.

n. Silicified wood, at Tuscarora. Very fine at San Antonio.

o. Jasper, at Deep Spring Valley, near Silver Peak, and along the western border of the Virgen River mesa; usually of dull yellow or red colors. Better specimens at Gold Mountain. Abundant on the desert east of Lone Mountain.

p. Flint (hornstone), in the limestone south of Eureka; also east of Lone Mountain.

q. Obsidian, in fine pieces and very abundant ten miles southeast of Silver Peak. Across the State line (five miles), in Owens Valley, it occurs in red fragments, also banded with alternate layers of black and brown.

Silver. In small foliated masses at Bull Run; Eureka; at Belmont it sometimes occurs in fine reticulated forms. In delicate fibers in Galena District.

Silicified wood. See *Silica.*

Stembergite. Reese River. (Loew.)

Stephanite. In small crystals at Reese River and at Belmont. Occurs also in other regions.

Stetefeldtite. Sparingly at Mineral Hill, Hyko, and Eureka.

Stromeyerite. Occurs in various districts. Fine but small specimens from Comstock Lode and Belmont; also at Cope, Lone Mountain, Mineral Hill, San Antonio, Eureka, and Palmetto.

Sternberghite. In small but fine crystals at Reese River.

Sulphur. In small crystals at Carlin. In large quantities, massive and crystallized, at Mount Diablo, between thirty and forty miles northwest of Silver Peak.

Talc. Several small specimens were obtained at Reese River.

Tetrahedrite. Locality unknown. (Foote.)

Thenardite. Occurs as an acicular efflorescence on dry mud and halite, in Death Valley, ten miles south of Furnace Creek Cañon.

Tourmaline. In small greenish-brown crystals at Morey.

Trona. Death Valley, Churchill County.*

Turquois. Occurs in the mountains five miles north of Columbus. The specimens are nearly all of a pale blue color, although some finely tinted ones have been obtained.

Uxelite. Locality unknown. (Foote.)

Water. See APPENDIX B.

Wavellite. Occurs on slate near Belmont.

Wolframite. Found in the White Mountains, associated with hübnerite.

Wulfenite. Occurs in fine tabular crystals at Eureka.

Zincazurite. Found sparingly in Railroad District.

In the above list I have omitted those compounds occurring all over the State in greater or less abundance, such as *pumice*, *scoria*, *lava*, etc., they being deemed unnecessary, and not essentially of value in a simple list of minerals.

APPENDIX A.

COAL.

Unfortunately but little information can be given regarding the subject of coal and lignite. About ten miles southwest of Carlin I observed a narrow seam of lignite. This was the only representative encountered. What remarks are added below are derived chiefly from a paper† sent to the Institute of Mining Engineers by Mr. A. J. Brown, of Treasure City. I was also informed at Battle Mountain that ten or twelve miles east of that place coal of good quality was being worked. I have been unable to obtain specimens from the various mines in time for this paper, but hope ere long to be able to submit a series of analyses illustrating the value of each specimen and an average result of those sets of the respective mines.

Mr. Brown says, in allusion to the Pancake coal, that "it is rather

* Dana, Manual of Mineralogy, 1868, p. 706.

† Quoted in Mineral Resources West of the Rocky Mountains, R. W. Raymond, 1875, pp. 268, 269.

early yet to make any estimate of the future value of the discovery, but it is certainly the most promising vein of coal yet discovered in the State of Nevada, and I believe the first true coal found west of the Rocky Mountains, or perhaps west of the Missouri River, unless some of the Utah coals belong to the coal-measures of Carboniferous age. . . . About midway between White Pine and Pancake two or three mounds, which are identical, both lithologically and paleontologically, with the limestone of Treasure Hill, crop through the Quaternary formation of the valley, and still further west are found dark bituminous shales identical with those found along the east slope of Treasure Hill and under the towns of Hamilton and Eberhardt. Some four miles still further west, and belonging to a much higher geological horizon, we find the coal formation." This gentleman further says that fossils have been found—vegetable. A few *Sigillaria* have been collected on the surface in the immediate vicinity. No analyses are given in the report, and nothing can be said regarding the actual value of the discovery. The coal above referred to is found in a vein of from five to six feet in thickness, though distorted and broken, running north and south, "and dips quite steeply (40°) to the west. . . . Several experiments at coking on a small scale have been tried, and have resulted satisfactorily."

Mr. Raymond says that during the year 1874 the mine was worked to a depth of 480 feet, measured on the incline, the Eureka Consolidated Company buying the coal at the rate of from $12 to $20 per ton on the dump.

The Momomoke and Antelope Ranges have since been examined, but, as far as I have been able to learn, with but little success.

At many of the smelting works, the reduction of silver ores was accomplished by the use of charcoal. The scarcity of wood in some regions has caused some uneasiness of late, and coal must either be brought from outside sources at great expense or developed within the State, if it can be discovered in sufficient quantity and of necessary quality.

APPENDIX B.

WATER.

In giving the following list of springs, both mineral and thermal, the qualitative results only are stated. In nearly all instances there was more or less organic matter present—from local causes—so that at the end of six or eight months, when the vessels were opened, the presence of sulphureted and carbureted hydrogen gases proved that material changes had been wrought, sufficiently at least that no analyses would show what the sample was when collected. The mineral ingredients in some were unimpaired, as they were comparatively the same as when collected.

In a recent number of the Naturalist, a list of thermometric experiments is given of a number of springs in the vicinity of Silver Peak, by a gentleman* who visited the locality at the same time my observations were made. These springs are located chiefly in the western border of a large salt marsh. They run irregularly north and south, and none of them are of large extent, ranging from several feet to a few yards in diameter.

The first of these springs was originally of larger size than it is now; owing to a long-continued deposit of saline matter around the border, a crust was formed, which has gradually narrowed the opening to a diameter of not more than five feet. How far the water recedes under this formation is not known. The chief constituents of the water are borax and several compounds of soda. It is also strongly impregnated with and emits sulphureted hydrogen gas.

No. 2 is also rather saline and unfit for use. It is situated about twenty yards from No. 1, and measures about 18 feet in diameter.

Observations taken July 7, 1871.

			6.30 a. m.	7.35 a. m.
Temperature of..	Air	*Dry bulb*	62.4°	73.7°
		Wet bulb	—	70.8°
	Water		67.5°	69.0°

No. 3 is also saline and nearly closed over with incrustations.

Temperature ..... 79°

No. 4, four feet distant from the last named, and about one hundred paces from No. 2.

Temperature ..... 117°

No. 5, about ten or twelve paces from No. 6, very strongly impregnated with sodium chlorid.

Temperature ..... 116.5°

No. 6, saline; the examination was made late in the day, which accounts for the difference in the temperature of the air, as given below.

Temperature of water ..... 79.0°

Temperature of air ..... 66.3°

No. 7 was the last upon which I took notes, and was also the most northern visited by me. Frequently emitted steam.

Temperature of water ..... 117.8°

Lieutenant Lyle mentions several others, chiefly saline, of which the temperatures were respectively 79°, 117.8°, and 116.5°. I am inclined to believe that the last named is No. 5 of my list.

About forty miles east of Silver Peak and six or seven miles north-northeast of Montezuma we encamped near several springs located at the base of Mount Nagle, or rather the northern spur of the mountain.

No. 1 contained scarcely any saline matter, but was strongly impregnated, and emitted a great deal of sulphureted hydrogen gas.

* D. A. Lyle, U. S. Army. <Am. Nat. vol. xii, No. 1, 1878, pp. 18–27. (*l. c.*)

No. 2, a few paces farther west; the water contained sulphate of soda in considerable abundance.

No. 3. Besides these three named, there were other small pools highly impregnated with chlorid of sodium. In all, these springs afforded but little comfort to thirsty travelers.

Two miles south of Gold Mountain, at Pigeon Springs, the water is rather scanty, but what exists is highly charged with the compounds of soda.

I was informed that east of this range, in the head of Death Valley, there was a spring the waters of which consist of nearly a saturated solution of alum. Although the information was derived from a miner of more than ordinary education, the statement can scarcely be relied upon, until samples of the water have been submitted to systematic analysis.

Near the greatest depression of Death Valley,* observations were taken on August 24, 1871, from 10.30 a.m. until 7.30 p.m. At this locality, we found a spring of palatable water, about eight feet across, and over twenty in length, around the borders of which was a fair growth of tall reeds, or tule-grass.

Sp. gr. of water at 60°, 1.008.

Temperature of water at 3 p.m., 80.7°.

Temperature of air at 3 p.m., 117°.

The thermometers were suspended from the dead branches of a mesquite-bush, clear of all materials having any local effect upon the instruments; and at some distance double blankets were suspended between the upright saplings to avoid the direct rays of the sun.

In the eastern portion of Armagoza Desert, at the base of a range of low hills, is a fine, strong spring of pure water. The locality is known as Ash Meadows, and the springs are called Grapevine Springs.

Sp. gr. of water at 60°, 1.003.

Temperature of water, 81.6°.†

A spring situated at the base of the hills running along the western edge of Diamond Valley is of doubtful character regarding the temperature. Lieutenant Wheeler, who was with me at the time, considered it safe to estimate it at 150°.‡

Deep Spring Valley furnishes a number of springs of various temperatures and qualities of water. The following were the only ones which I had an opportunity of passing.

The first was a sulphur spring, and was covered to great extent with a dense growth of grass and weeds.

Temperature of water, 65.5°; air, 82.5°.

Later in the day I passed a good-sized body of water, very alkaline, and scarcely fit to be used for cooking purposes. The spring or pond

* East from Telescope Peak 3° 14′ N., and distant from 15 to 18 miles.

† Quoted from author's MS. by Mr. G. K. Gilbert. < U. S. Geolog. and Geograph. Sur. West of 100th Meridian, vol. iii, 1875, p. 152.

‡ *Ibidem.*

was about one hundred and twenty yards long and twenty-five yards broad.

Temperature of water, 77.6°; air, 78.60°.

A short distance from this was another body of water, very clear, and free from foreign substances. It was nearly round, with an average diameter of nearly one hundred yards.

Temperature of water, 74°; air, 78°.

There were numbers of springs visited which would have been examined *en détail* but for the lack of necessary vessels for the transportation of samples. As before stated, some that were brought back for thorough analysis contained sufficient organic matter originally so as to be in a worthless condition when opened for any such purpose. In others there was an accumulation of gas, either carbureted hydrogen or sulphureted hydrogen, from the decomposition of foreign matter held in suspension. In only a few instances were the samples fit for a qualitative analysis. There should always be sufficient chemicals and appliances on hand in the field, so as to obtain some idea of the nature of the constituents present, and to submit duplicates to critical examination, if possible, at the earliest convenient time and place.

APPENDIX C.

NOTE ON THE RARER MINERALS FOUND IN OWENS VALLEY, CALIFORNIA.

Blind Spring District, located in the upper end of Owens Valley, furnished some beautiful examples of crystallized compounds, until the mines reach a depth of over 200 feet, when water-level was reached. Beneath this, the "heavy sulphuret ores" occur, where the volatile compounds, or those containing iodine, bromine, chlorine, antimony, or arsenic, are rarely found. The latter occur above, where, through various physical causes, compounds containing one or more of these elements are formed. Good crystals of most minerals are scarce throughout the extreme West as a rule; but at times fine examples occur, though not in abundance, excepting in a few instances.

1. *Angelsite.*—Crystals half an inch in length and a quarter of an inch thick have been secured in small quantities.
2. *Argentite.*—Small specimens of great purity.
3. *Azurite.*—In fine masses and clusters of crystals.
4. *Cerussite.*—In small but brilliant crystals.
5. *Cuprite.*—In cubes 0.4 of an inch across. Brilliant and perfect.
6. *Malachite.*—In small but beautiful masses.
7. *Mimetite.*—Sparingly, with other compounds of lead.
8. *Minium.*—Rarer than the last-named.
9. *Partzite.*—Rather abundant shortly after the opening of the mines.

The ore yielded from $500 to $1,500 silver per ton. Choice specimens yielded even more

Another compound was found associated with partzite, which the miners distinguished under the local name of bismarckite. There was not much that could be secured, and shortly after my return several specimens were sent to Professor Chandler, of Columbia College, N. Y., for determination. No satisfactory results were obtained of the small quantity. The mineral, according to Mr. Partz, acted differently from partzite in the furnace. It was not as hard as the latter, rather granular at times, sometimes of a yellowish color; frequently there were bands of yellow and dark greenish-black. In appearance it looked as if it were a mechanical mixture of *embolite* and *partzite*.

10. *Pyromorphite.*—In small but fine crystallizations, passing through various shades of green, through pale brown, into dark olive.

11. *Siderite.*—Very fine crystals; perfect.

12. *Sphalerite.*—Mr. Partz informs me that beautiful crystals of various shades of pale greenish-yellow, light, and dark brown colors have recently been found in the Comanche Mine, Blind Spring District. He has found in massive varieties as much as $2,100 silver per ton.

13. *Stetefeldtite.*—In small quantities, but making fine cabinet specimens.

14. *Stromeyerite.*—Occasionally, in moderately sized specimens.

15. *Strontianite.*—This has been recently found in small quantities, well crystallized, at the mines at Cerro Gordo, in the southeastern portion of Owens Valley, near the Nevada State line.

At or near the same place, arsenolite has been found in small quantities, having observed it myself. The presence of this mineral in that range gives some color to the prospectors' tale of a spring of poisonous water further south. I have been told repeatedly, by various parties, that dead jackass-rabbits and other small game have been found near there in all stages of decomposition, or "dried up". Such is possible, as decomposition of the mineral may furnish soluble salts of arsenic, even in small quantities, which in time may become very strong through concentration by the evaporation of the water.