NOTES

ON THE

NATURAL HISTORY

OF PORTIONS OF

MONTANA AND DAKOTA;

BEING THE SUBSTANCE OF A REPORT TO THE SECRETARY OF WAR ON THE COLLECTIONS MADE BY THE NORTH PACIFIC RAILROAD EXPEDITION OF 1873, GEN. D. S. STANLEY, COMMANDER.

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Notes on the Natural History of Portions of Dakota and Montana Territories, being the Substance of a Report to the Secretary of War on the Collections made by the North Pacific Railroad Expedition of 1873, Gen. D. S. Stanley, Commander.

By J. A. Allen, Naturalist of the Expedition.

I. Introductory.

The route taken by the Expedition may be briefly indicated as follows: — Starting from Fort Rice, on the Missouri River (a point a little to the north of the geographical centre of Dakota), our course was thence nearly due west to the Yellowstone River, in Montana Territory, which we struck a few miles above the mouth of Glendive Creek. Crossing the Yellowstone at this point, (where a temporary post was established, called Camp Thorne), we followed up its left bank to Pompey's Pillar, a distance of one hundred and ninety miles. We kept mainly to the bottom lands, but the high bluffs being cut by the river at frequent intervals, we were forced occasionally to the adjoining highlands. Leaving the Yellowstone at Pompey's Pillar, we crossed over to the Musselshell, which we struck near the 109th meridian. From this point the Expedition descended the valley of the Musselshell, as far as the "Big Bend," — a distance of about seventy miles — where we left it, and by a southeasterly course reached the Yellowstone again at the mouth of Little Porcupine Creek. Thence down the Yellowstone, and eastward to Fort Abraham Lincoln, on the Missouri, our course was essentially the same as that pursued on our way out. The route of the Expedition hence lay

wholly between the 46th and 47th parallels, sweeping somewhat sinuously from one to the other, and extended from near the 100th meridian to the 109th.

The whole extent of country traversed is thus, in respect to its fauna, wholly beyond the western boundary of the so-called "Eastern province" of North America, and is comprised within the excessively arid belt of the western plains. But throughout this wide area, the country, either in respect to its general features or its productions, is by no means everywhere alike. The eastern border receives much more rain than the western, and the vegetation is proportionally more abundant and varied, with, of course, corresponding differences in the fauna. Geologically the region is wholly embraced within what has been termed the Lignite Tertiary Formation, but includes limited outcroppings of the Upper Cretaceous. It hence embraces considerable areas deeply scored by erosion, forming the well-known "Bad Lands" of the Upper Missouri district. A broad belt of these Bad Lands extends along the Little Missouri, and they occur at intervals all along the Yellowstone and its principal tributaries. They form the favorite haunts of several species of animals and plants not found generally dispersed over the plains.

From the Missouri River westward, nearly to the Little Missouri, the country gives evidence of considerable fertility, being covered with a good growth of grass, which the present year remained quite green till our return in September. Along the streams occur scattered clumps of timber, composed chiefly of box-elder, elm and cottonwood, with here and there groves of oak, the latter being confined chiefly to the coulées, or dry ravines, that extend back from the larger streams. Passing this semi-fertile district we arrive at the Little Missouri belt of Bad Lands, twenty to thirty miles in breadth. Beyond these we again meet with comparatively fertile grassy prairies, which extend to the divide west of Inman's Fork of the Little Missouri, or for a distance of some thirty miles. On reaching this divide (that of the Little Missouri and Yellowstone) we find indications of a more arid climate, the vegetation becoming more scanty, the grass shorter and thinner, and cacti and sage brush begin to be for the first time common, and even at times the predominating plants. Thence to the Yellowstone the country becomes still more and more barren, and is deeply cut by erosion, belts of "Bad Lands" bordering the Yellowstone and its tributaries, and rendering an approach to them with wagons a very difficult undertaking.

The valley of the Yellowstone indicates a great degree of aridity of climate and soil, but the overflowed portions generally afford an abundance of good grass, interspersed, however, with large areas occupied almost exclusively with luxuriant growths of either *Opuntia missouriensis*, grease wood (*Obione vulgaris*), or sage brush (*Artemisia canescens*). The several terraces of the river are even more barren than the bottom-lands, though occasionally affording fine grass, while the plateaus on either side, but especially to the westward, are often nearly destitute of grass, the vegetation consisting mainly of cacti and low depauperate forms of *Artemisia*, and their few characteristic associates. The divide between the Yellowstone and Musselshell, at the point where we crossed it, is also quite similar, a more barren country than that bordering the Musselshell from the 109th meridian to the Big Bend, or than that between the two Porcupine Creeks, being hard to find anywhere east of the Rocky Mountains.

From Camp Thorne, or the "Yellowstone Crossing," nearly to Tongue River, there is very little timber in the valley of the Yellowstone, frequently not a single tree occurring for miles. Quite large forests begin to appear a little below the mouth of Tongue River, extending up that tributary as far as can be seen from the bluff opposite its mouth, and almost uninterruptedly along the Yellowstone thence to Pompey's Pillar, forming an almost continuous belt of varying width. The trees are almost exclusively cottonwood, and are many of them of large size. They sometimes form thick forests, half a mile to a mile in breadth, but more frequently grow in more or less detached belts and clumps, being confined to the old beds of the river or its affluents. In the valley of the Musselshell the cottonwood belt is almost uninterrupted, and is much wider in proportion to the size of the river than that along the Yellowstone, frequently attaining a width of one-half to three-fourths of a mile. The bluffs on the east side of the Musselshell, as far as the Great Bend, as well as the bluffs on both sides of the Yellowstone above the Porcupine Creeks, and much of the region between the Mussellshell and Yellowstone, from the Big Porcupine to Pompey's Pillar, is sparsely covered with pines, which attain the height of thirty to eighty feet, and give the country, when seen at a distance, the appearance of being quite thickly wooded. The distribution of the pines serves to mark the extent of the tertiary sandstones, the pines abruptly disappearing with the appearance of the cretaceous clays and marls.

With these preliminary remarks descriptive of the general character of the country, we proceed to give in detail such observations as our rapid journey of nearly one thousand miles in less than one hundred days, including detentions, enabled us to make respecting the vertebrate fauna of the district through which we passed. Although we moved quite too rapidly to allow of a very satisfactory examination of the country traversed, or to admit of the formation of very large collections, it is believed that but few species escaped notice, while of the greater part specimens were either preserved or examined.

In this connection it gives me great pleasure to acknowledge my indebtedness to my valuable assistant, Mr. C. W. Bennett, for important aid in my work, and for many facts recorded in the following pages. Mr. S. H. Scudder has kindly prepared the report on the butterflies, and Dr. Geo. Vasey, botanist of the Department of Agriculture, has prepared the report on the plants, with which I have incorporated a few remarks on the relative abundance and range of some of the more prominent species. The report on the fishes is unavoidably delayed.

II. Report on the Mammals.

Although the region now under consideration is so barren, and has hitherto been so little frequented by white men, considerable changes in the relative abundance of the larger mammals have already been effected by human agency. The buffalo that once swarmed over these plains has wholly disappeared east of the Yellowstone, as far up at least as the Tongue River, and with his decline have nearly disappeared the coyote and the wolf. The elk and the black-tailed deer were formerly abundant along all the principal streams, but neither now occurs in any numbers except on the Musselshell, and on the Yellowstone above the mouth of Powder River. The mountain sheep, or Bighorn, still occurs sparingly in the Bad Lands bordering the Little Missouri and Yellowstone Rivers. The Pronghorn is the only one of the herbivores that is still generally distributed, being now the most numerous of the larger mammals. A very fatal disease, however, visited them the past summer (1873), sweeping away thousands inhabiting the region between the Little Missouri and Yellowstone divide and the Missouri River, in fact nearly depopulat-

ing the district; so that many years must elapse before they will again be as abundant here as formerly.

With perhaps one or two exceptions, none of the smaller mammals can be considered as abundant. The prairie dog is much less numerous than further south, and the striped gopher is far from abundant, though these are among the most numerously represented species. Along the Yellowstone, however, the *Dipodomys Ordii* may be fairly regarded as abundant.

FELIDÆ.

1. Lynx rufus Raf.[1] Bay Lynx. Wild Cat.

Indications of their occurrence were noticed along the Yellowstone and Musselshell Rivers, and a young one was shot near our camp on the Big Porcupine.

CANIDÆ.

2. Canis lupus var. **occidentalis** All. Gray Wolf.

Rare east of the Little Missouri, but frequent indications of their presence were noticed as we approached the Yellowstone, and from the mouth of the Big Horn up the Yellowstone and over to the Musselshell and back, they were heard in considerable numbers about camp nearly every night. They are rare now, however, throughout this whole region, in comparison with their former abundance. Dr. Hayden, writing in 1863, says, "Countless numbers are seen in the valley of the Yellowstone, and along the Missouri above Fort Union, and woe to any poor buffalo, elk or deer, which may have been so unfortunate as to have been wounded by the hunter, or to be in the decline of life."[2] They, however, no longer occur in such large numbers on the Lower Yellowstone.[3]

[1] The authorities adopted here are those of the first author who used both the generic and specific names in their present connection. In the case of varietal names, the same practice is followed. The authority is hence regarded, as the writer has always regarded it, as a part of the name, and not as a property label.

[2] Trans. Am. Phil. Soc., Vol. XII, p. 141.

[3] In writing of the varieties of color presented by our wolves in 1869 (See Bull. Mus. Comp. Zool., Vol. I, p. 156), I overlooked the following important remarks on this subject by Dr F. V. Hayden: — He says, "This animal varies so much in color that the traders on the Upper Missouri suppose there are four or five species. I have seen them differing in color from an almost snowy whiteness to a dark brown or black, and was at first inclined to attribute this difference to age and sex, but Mr. Zephyr, an intelligent trader, informed me that he had noticed the same variations of color in all ages." Trans. Am. Phil. Soc., Vol. XII, p. 141.

3. Canis latrans Say. Coyote. Prairie Wolf.

Not common east of the Yellowstone. In the valley of the Yellowstone and westward, they were heard in considerable numbers every night, and were occasionally seen while we were on the march, particularly in the Musselshell district. None were heard on our way out till we reached the Yellowstone, but from the Yellowstone "Crossing" westward they were at times quite numerous. The wolves, including the Coyote and the Gray Wolf, have been nearly exterminated over the region most frequented by hunters, by the use of strychnine. The hunters have pursued them till too few of them are left to make "wolfing" profitable. They now say, "There are now no wolves here," they have become so much scarcer than they formerly were.

4. Vulpes vulgaris var. **macroura** All. Western Fox.

Quite common along the Yellowstone, and thence westward to the Musselshell.

5. Vulpes velox Aud. and Bach. Kit Fox. Swift.

Quite frequent.

MUSTELIDÆ.

6. Mephitis mephitica Bd. Common Skunk.

But two or three individuals were met with on the whole trip. Apparently not very numerous.

7. Taxidea americana Waterh. American Badger.

Apparently more or less common, though but very few were seen.

URSIDÆ.

8. Ursus arctos var. **horibilis** All. Grizzly Bear.

Very scarce. Less than half a dozen were reported or seen by the whole Expedition collectively, during the whole trip, and only one old one and two cubs were killed. Even very few signs of them were noticed.

PROCYONIDÆ.

9. Procyon lotor Storr. Raccoon.

Saw tracks in the mud along the Yellowstone that were unmistakably those of the raccoon, but none of the animals were either taken or observed.

BOVIDÆ.

10. Bos americanus Gray. American Bison. "Buffalo."

Recent signs of the buffalo were first met with in the valley of the Yellowstone, near the mouth of the Rosebud — tracks of single old bulls that had passed down to the river for water within a period of a few weeks. Above this point considerable numbers seemed to have frequented the river valley during the early part of the season (1873), and tracks but a few days old were frequent for the last ten miles before reaching Pompey's Pillar. The first buffalo *seen* was observed about twelve miles west of Pompey's Pillar. Eight miles further west, on the divide between the Yellowstone and the Musselshell, we found large herds had grazed but a day or two before our arrival, and fresh tracks of cows and calves, as well as of bulls, were abundant. From this point to the Yellowstone we were frequently in sight of quite large bands, and quite a number of individuals were killed. They moved off rapidly, however, as we approached, and at no time were more than a few hundreds in sight at once. We found later that the valley of the Musselshell and its adjoining prairies had been the recent feeding ground of large herds, immense numbers having evidently spent the early part of the season there. They seemed not, however, to have visited the valley in large numbers before for many years, as all the trails and other signs had most evidently been made within the few weeks immediately preceding our arrival. Traces of ancient trails remained, but they were few and insignificant as compared with those of the present year. The herds seemed to have occupied the whole valley as far as we followed it (from the 109th meridian to the Big Bend), as well as the plains on either side. Considerable bands had also ranged over the divide between the Musselshell and Yellowstone, particularly along the two Porcupine Creeks. Gen. Custer met with small herds still further to the eastward, and the main expedition came in sight of a few near the mouth of Custer's Creek, where several were killed by the scouts. On our return we found that during our absence small bands had visited the valley of the Yellowstone itself as far down as Powder River, while quite large herds had recently passed up Custer's Creek.

Occasional skeletons and buffalo chips in a good state of preservation occur eastward nearly to the Missouri, but the only very recent signs observed this year east of the Yellowstone were the tracks of a few old straggling bulls a few miles east of the river. The last buffalo killed near Fort Rice was taken in 1869, when three were killed

from a herd of ten old bulls that had strayed far to the eastward of the main herds. It is but two or three years, however, since they ranged one hundred to two hundred miles east of the Yellowstone in the latitude of Fort Rice.

11. Ovis montana Cuv. Bighorn. Rocky Mountain Sheep.

Not common. First met with in the Bad Lands, near the head of Glendive Creek, and seen occasionally in the Bad Lands that border the Yellowstone. Not more than six or eight were secured by the hunters and scouts altogether, though their fresh tracks were quite abundant at a few localities.

ANTILOCAPRIDÆ.

12. Antilocapra americana Ord. Pronghorn. "Antelope."

Generally distributed, and more or less common. Most frequent, however, between the Missouri and Little Missouri Rivers.

During the summer of 1873 a fatal epidemic raged among the prong-horns over nearly the whole area between the Yellowstone and Missouri Rivers, destroying apparently three-fourths to nine-tenths of them. The greatest fatality seems to have occurred in July, judging from the size of the fawns found dead, and hence not long after we crossed this portion of the country. From the head of Heart River to the Missouri we found their carcasses, on our return, thickly scattered along our line of march, including those of both sexes and all ages, fawns being often found lying within a few yards of their dams. On our way out antelopes were almost constantly in sight, but on our return they were only rarely met with, ten dead ones being seen to each living one. The epidemic seems not to have extended beyond the Yellowstone, where they seemed more numerous on our return than on our way out, and where no dead ones were observed.

The previous year they are reported to have ranged over this section of the country, in autumn, in very large numbers, bands of two or three hundred being sometimes met with by the Yellowstone Expedition of 1872, on its return eastward. Four were captured by the men as the frightened animals attempted to run through the train.

Epidemics similar to that affecting the prong-horns, are well known to occasionally affect deer, rabbits and field mice. A few years since (about 1869) the Jackass Rabbits of Salt Lake Valley, Utah, were nearly exterminated by a fatal disease, their dead bodies being found scattered over the plains in great numbers. From being so common

that some of the farmers were accustomed to shoot them to feed to their hogs, they became so scarce that but two or three could be obtained in a whole day's hunt, and sometimes none would be met with. From frontiersmen and hunters I have learned of deer being similarly swept away and almost exterminated over quite large areas.

The field mice, especially the *Arvicolæ*, it is well known are periodically excessively abundant, and again very scarce, and this variation in their numbers is probably due to a similar cause.

CERVIDÆ.

13. Cervus canadensis Erxl. Elk. Wapiti.

Quite numerous along the Musselshell, and also on the Yellowstone above Powder River, and occasional near all the larger wooded streams.[1]

14. Cervus macrotis Say. Mule Deer. "Black-tailed Deer."

More or less frequent along all the wooded streams, and quite common on the Yellowstone and Musselshell Rivers.

VESPERTILIONIDÆ.

15. Lasiurus noveboracensis Gray. Red Bat.

Apparently not very unfrequent along the more heavily timbered portions of the Yellowstone and Musselshell Rivers. Often seen flying about camp after nightfall.

16. Scotophilus fuscus H. All. Brown Bat.

One specimen was taken on the Yellowstone, near the mouth of the Little Porcupine. Probably more or less frequent.

[1] A yearling buck was killed on the Musselshell, which had a very singular malformation of the left antler. It is essentially a double antler, and is attached to the skull by a base three inches long by an inch in diameter. The antler divides into two main parts or beams about three inches from the head, each beam sending out a branch from near its base. There is no trace of a bur or enlargement at the usual point, the bony portion passing higher than usual, and blending insensibly with the horn proper. The anterior beam is fifteen inches long, and inclines a little backward; it sends out a branch seven inches long from near the base of its anterior face, which in turn is also bifurcate at the end. The posterior beam is seventeen inches long, being a little larger than the anterior, and parallel with it. Near the base a branch four inches long arises from its posterior face, which grows in a horizontal direction, curving inwards, and nearly clasping the base of the right antler. The right antler is of the usual size and form of that of a buck of this age.

17. Scotophilus noctivagans H. All. Silvery-haired Bat.

One specimen was taken at our camp of August 29, on the Big Porcupine.

18. Vespertilio subulatus Say. Little Brown Bat.

A specimen was taken at the mouth of the Little Porcupine, Sept. 1. A small bat of probably this species was more or less frequent at most of our camps along the Yellowstone and Musselshell Rivers.

MURIDÆ.

19. Mus musculus Linn. House Mouse.

A specimen was taken in our camp at Fort A. Lincoln, where the species was already becoming common, although the post had been established but one year.

20. Hesperomys leucopus var. **sonoriensis** Coues, Ms. White-footed Mouse.

A specimen was taken at the Big Bend of the Musselshell, and another on Heart River, and it undoubtedly occurs with greater or less frequency along all the principal streams.

21. Neotoma cinerea Bd. Mountain Rat.

More or less frequent along the timbered portions of the streams.

22. Arvicola riparius Ord. Meadow Mouse.

A specimen was collected near the head of Heart River by Dr. W. J. Hoffman, and by him kindly presented to the collection. Signs of their presence were observed at various localities, but no other specimens were obtained.

SACCOMYIDÆ.

23. Dipodomys Ordii Woodh. Jumping Rat.

The most abundant mammal met with in the valley of the Yellowstone; much less common on the Great Porcupine Creek and in the valley of the Musselshell. It seems to prefer the dryest situations, burrowing beneath the cacti and in bunches of sage brush everywhere. Rarely seen abroad, but occasionally surprised and killed by the teamsters and soldiers, the collection being indebted to the kindness of Dr. Hoffman for several specimens thus obtained. These animals form little paths or "run ways" leading in various directions from their burrows, not unlike those made by muskrats.

24. Perognathus flavus Baird. Pouched Mouse.

Apparently common. First met with at the Big Muddy, and afterwards along the Yellowstone and Musselshell.

GEOMYIDÆ.

25. Thomomys rufescens Maxim. Fort Union Gopher.

The little mounds of earth thrown up by some species of *Thomomys* were frequent in the moister parts of the prairies east of the Yellowstone, but were more rare along the Yellowstone, and still less frequent along the Musselshell. The only specimen obtained was taken on the Yellowstone, near Camp Thorne.

CASTORIDÆ.

26. Castor fiber Linn. Beaver.

Sparsely distributed along all the principal streams. Along the Yellowstone indications of their presence were seen at only a few points.

SCIURIDÆ.

27. Sciurus hudsonius Pall. Red Squirrel.

One or two were seen on the Musselshell, among the pines that cover the sandstone ridges.

28. Tamias quadrivittatus var. **pallidus** All. Missouri Striped Squirrel.

Rather frequent from the Little Missouri westward, especially in the bad lands along the Yellowstone and the sandstone bluffs of the Musselshell. Nowhere, however, very abundant.

29. Spermophilus tridecem-lineatus var. **pallidus** All. Striped Gopher.

Generally distributed, but much more numerous on the prairies east of the Yellowstone than in the Yellowstone valley, or west of it.

30. Cynomys ludovicianus Bd. Prairie Dog.

More or less generally distributed throughout the region traversed, but nowhere very numerous, and sometimes not seen for days together.

HYSTRICIDÆ.

31. Erethizon dorsatus var. **epizanthus** All. Porcupine.

Rather rare. Two specimens were killed near the Heart River, and indications of their presence were seen elsewhere.

III. Report on the Birds.

Notwithstanding the almost entire absence of timber, and the generally arid nature of the country, the birds are comparatively numerous, but belong mainly to a few species. The greater part are of course prairie species, but more woodland birds occur than would naturally be looked for in a region so destitute of trees. Every tree and every clump of shrubbery, however isolated, forms the home of one or more pairs of tree-nesting species, while the continuous though narrow belts of trees, and their accompanying undergrowths, are far more populous with bird-life than similar patches of timber are in the better wooded parts of the country. The prairies, particularly those east of the Yellowstone, abound in birds, a few species, almost universally distributed, being exceedingly numerous in individuals. These are, more especially, two species of *Plectrophanes* (*P. ornatus* and *P. Maccowni*), the lark bunting (*Calamospiza bicolor*), and the meadow lark (*Sturnella ludoviciana* var. *neglecta*). The horned lark (*Eremophila alpestris*), the grass finch (*Poœcetes gramineus*), Baird's bunting (*Centronyx Bairdii*), the Missouri skylark (*Neocorys Spraguei*), the yellow-winged and clay-colored sparrows (*Coturniculus passerinus* and *Spizella pallida*), the cow bird (*Molothrus pecoris*), the night hawk (*Chordeiles popetue* var. *Henryi*), the Carolina dove (*Zenœdura carolinensis*) and the upland plover (*Actiturus Bartramius*), make up the chief part of the rest. Of the woodland birds, the three by far most abundant species are the Arkansas flycatcher (*Tyrannus verticalis*), the king bird (*Tyrannus, carolinensis*) and the red-headed woodpecker (*Melanerpes erythrocephalus*). The cat bird (*Mimus carolinensis*), the brown thrush (*Harporhynchus rufus*), the yellow warbler (*Dendrœca æstiva*), the Arctic towhee (*Pipilo maculatus* var. *arcticus*), and the common wren (*Troglodytes œdon*) are next in abundance, and are pretty sure to be met with wherever there are a few trees and thickets of underbrush. The Arkansas flycatcher probably nearly outnumbers all the other woodland species together, excepting the king bird, which is almost equally abundant. Isolated trees, though miles away from the nearest clump of timber, are sure to be inhabited by one or more pairs of these birds. Thickets of low willows and rose bushes, however isolated, are almost equally certain to form the home of one or more pairs of cat birds, or brown thrushes, or black-headed grosbeaks (*Goniaphea melanocephala*), and sometimes of each of these.

A clearer idea of the association and relative abundance of the species at particular localities may be obtained from the following abstracts from my note-book, than can be gained from the general list.

At Forts Rice and Lincoln, on the Missouri River, where about two weeks were spent in June, a greater variety of species occur than at any point that we visited further west, owing, of course, to the much greater extent of forest occurring here. At Fort Rice, in the wooded bottom-lands of the Missouri, birds were extremely numerous, twenty or twenty-five species being common, and some of them abundant, as indicated in the subjoined list. During the early part of the day, and also toward evening, they filled the air with song, so many singing at once that the song of any particular individual could scarcely be distinguished. At this time but few of the species had commenced nesting. The forest growth of these bottom-lands consists of large, rather scattered trees of oak, ash, willow and cottonwood, with a dense undergrowth of rose, willow and *Symphoricarpus*, at times so dense as to be almost impenetrable. The following birds were observed at this locality during the third week of June: —

Turdus migratorius. Not common.
Turdus fuscescens. Abundant.
Harporhynchus rufus. Frequent.
Mimus carolinensis. Very abundant.
Icteria virens. Very abundant.
Dendræca æstiva. Very abundant.
Mniotilta varia. Not common.
Geothlypis trichas. Abundant.
Troglodytes ædon. Common.
Seiurus aurocapillus. Abundant.
Setophaga ruticilla. Common.
Hirundo lunifrons. Abundant.
Vireo olivaceus. Common.
Vireo gilvus. Common.
Chrysomitris tristis. Common.
Spizella socialis. Common.
Spizella pallida. Common.
Chondestes grammaca. Common.
Cyanospiza amœna. Common.
Goniaphea melanocephala. Not common.

Pipilo maculatus var. *arcticus*. Abundant.
Quiscalus purpureus. Abundant.
Molothrus pecoris. Abundant.
Icterus Bullocki. Not numerous.
Corvus americanus. Abundant.
Tyrannus carolinensis. Abundant.
Tyrannus verticalis. Abundant.
Empidonax minimus. Common.
Chordeiles popetue var. *Henryi*. Abundant.
Chætura pelasgia. Common.
Colaptes auratus. Not common.
Melanerpes erythrocephalus. Abundant.
Picus pubescens var. *Gairdneri*. Not common.
Falco sparverius. Common.
Zenœdura carolinensis. Abundant.

Other woodland species were occasionally observed, but the above named were characteristically common. The following species were generally numerous on the adjoining prairies: —

Eremophila alpestris. Rather common.
Plectrophanes ornatus. Abundant.
Plectrophanes Maccowni. Common.
Poœcetes gramineus. Frequent.
Coturniculus passerinus. Common.
Sturnella ludoviciana var. *neglecta*. Common.
Pediœcetes phasianellus var. *columbianus*. Frequent.
Ægialitis vociferus. Frequent.
Actiturus Bartramius. Abundant.
Numenius longirostris. Occasional.

After leaving the Missouri, we of course found no large areas of forest. Along Heart River, which in places is well bordered with trees, we found nearly the same kinds of birds as at Fort Rice, and equally numerous in proportion to the more limited amount of timber. At the Big Muddy we were detained several days by high water, which afforded me an opportunity of becoming quite familiar with the birds found in the vicinity of our camp. The trees were limited to here and there a few low scraggy box elders and elms scattered along the creek, a few hundred yards to half a mile or more apart. The banks of the stream were clothed with a thick growth of rose bushes, mixed with a few willows and a species each of *Sympho-*

ricarpus and *Viburnum*, which, with the scattered trees already mentioned, formed the only resort available for the tree- and bush-nesting birds. Yet in the three or four days spent here (June 28th to July 1st) about forty species were noticed within the limited area of our rambles, twelve or fifteen of which may be regarded as tree- or bush-nesting species. But generally only a few pairs of each species were met with, the prairie species being the only ones really numerous. As indicating the general character of the bird fauna of this almost treeless region, I subjoin a list of the species met with, and remarks on their relative numbers, giving first the arboreal species and then the truly prairie forms, or those not materially influenced in their distribution by the presence or absence of trees.

Mimus carolinensis. Two or three pairs seen.
Harporhynchus rufus. A single pair observed.
Dendrœca æstiva. A few pairs noticed.
Troglodytes ædon. One pair seen.
Spizella pallida. Only once or twice observed.
Euspiza americana. Several seen.
Goniaphea melanocephala. Several pairs seen.
Tyrannus verticalis. Quite numerous.
Tyrannus carolinensis. One pair seen.
Sayornis Sayus. One pair seen.
Coccygus americanus. One seen.
Zenœdura carolinensis. A few pairs seen.
Buteo sp. Seen once or twice.

The following list is composed mainly of prairie species, but includes also several swallows and hawks that cannot properly be included among those of the preceding list: —

Neocorys Spraguei. Common.
Eremophila alpestris. Common.
Hirundo horreorum. Only a few seen.
Petrochelidon lunifrons. Quite frequent.
Cotyle serripennis. One small colony found.
Plectrophanes ornatus. Very abundant.
Plectrophanes Maccowni. Abundant.
Calamospiza bicolor. Abundant.
Poœcetes gramineus. Common.
Centronyx Bairdii. Common.
Coturniculus passerinus. Common.

Chondestes grammaca. Common.
Dolichonyx oryzivorus. Only one seen.
Molothrus pecoris. Common.
Agelæus phœniceus. One small colony.
Xanthocephalus icterocephalus. A few pairs, with the preceding.
Scolecophagus cyanocephalus. Occasional.
Sturnella ludoviciana var. *neglecta.* Common.
Chordeiles popetue var. *Henryi.* Common.
Speotyto cunicularia var. *hypogœa.* One pair seen.
Circus cyaneus var. *hudsonius.* One pair seen.
Archibuteo ferrugineus. Several seen.
Falco communis var. *anatum.* A single pair seen.
Pediœcetes phasianellus var. *columbianus.* Not frequent.
Ægialitis vociferus. Occasional.
Actiturus Bartramius. Common.
Ardea herodias. A single one seen.
Anas boschas. One pair seen.

Along the Yellowstone and Musselshell are found nearly all the species observed at Fort Rice, but generally more sparingly represented, and with the addition of *Sialia arctica*, *Salpinctes obsoletus*, *Centrocercus urophasianus* and *Ægialitis montanus.* A few others not yet mentioned were also occasionally met with, as shown by the following general list, in which one hundred and eighteen species are enumerated.

TURDIDÆ.

1. Turdus migratorius Linn. Robin.

Nowhere very numerous. It was rather frequent in June near Fort A. Lincoln, and a few were observed at Fort Rice, and along the Heart River. It was not again met with till we reached the valley of the Yellowstone, where a few pairs were seen at distant intervals. Along the Musselshell they were observed in considerable numbers wherever there were plenty of small fruits, as gooseberries, currants, bullberries (*Shepherdia argentea*), and wild cherries (*Prunus virginiana*).

2. Turdus fuscescens Stephens. Wilson's Thrush. Veery.

Common in the timbered bottom lands of the Missouri at Fort Rice, but not elsewhere met with. One nest was found by Mr. Bennett containing eggs *thickly speckled with very small dots of olive.*

Other nests were found with the eggs uniform green, as usual. Song and habits same as at the East.

3. Oreoscoptes montanus Bd. Sage Thrush.

Not common. Met with only along the Musselshell, and on the divide between the Musselshell and Yellowstone. Seen only at distant intervals, either singly or two or three together, and very difficult to approach. Frequents the sage brush and grease wood, often far away from streams or timber.

4. Mimus carolinensis Gray. Cat Bird.

One of the most common and generally distributed woodland species met with, occurring along the streams everywhere, even where the thickets of rosebushes and *Symphoricarpus* shrubs, with here and there an occasional clump of small willows and isolated scraggy box elders, were the only forms of arborescent vegetation.

5. Harporhynchus rufus Cab. Brown Thrush.

More or less common everywhere in the thickets along the streams from the Missouri to the Musselshell. Far less numerous, however, than the preceding species (*Mimus carolinensis*).

SAXICOLIDÆ.

6. Sialia arctica Sw. Arctic Blue Bird.

First met with at the crossing of the Yellowstone. Rather frequent along the Musselshell, and seen at Pompey's Pillar, and at a few other points on the Yellowstone. Much more numerous along the pine ridges than among the cottonwoods near the streams.

PARIDÆ.

7. Parus atricapillus var. **septentrionalis** All. Chickadee.

Frequent along the Yellowstone and Musselshell Rivers, and noticed in September along Heart River.

SITTIDÆ.

8. Sitta carolinensis var. **aculeata** All. White-bellied Nuthatch.

Observed at rare intervals, both on the Yellowstone and Musselshell Rivers.

TROGLODYTIDÆ.

9. Salpinctes obsoletus Cab. Rock Wren.

First met with about some rocky buttes near the Big Muddy (near Camp No. 12); common in the Little Missouri Bad Lands, and more or less frequent throughout the Bad Lands of the Yellowstone, and thence westward to the Musselshell.

10. Troglodytes ædon var. **Parkmanni** Cs. Common Wren.

Abundant along all the streams wherever there is timber.

ALAUDIDÆ.

11. Eremophila alpestris var. **leucolæma** Cs. Horned Lark.

Occasional in the breeding season throughout the region traversed by the Expedition, but nowhere very common, being far less numerous than at the same season on the plains of Kansas and Colorado. More numerous in September, when they were often seen in considerable flocks.

As on the plains generally, the form here met with is the variety with very pale colors, (var. *leucolæma* of Coues), having the yellow which forms so prominent a feature of the markings about the head and on the throat in the eastern form, either of the faintest tint of yellowish white, or quite obsolete.

MOTACILLIDÆ.

12. Anthus ludovicianus Licht. Titlark.

First seen September 6, when a small flock was met with on the Yellowstone, near the mouth of Powder River. Two weeks later they were quite common, occurring near Heart River in small flocks, associating with *Plectrophanes Maccowni* and *P. ornatus*.

13. Neocorys Spraguei Scl. Missouri Sky-lark.

First observed along the Heart River, about fifty miles west of Fort Rice; more or less common thence to the Yellowstone; and it was noticed once or twice on the plains beyond the Yellowstone. Ranges at least from the Yellowstone to the Missouri, and probably eastward to the Red River. Most numerous on the moist grassy prairies from the Big Muddy westward to the Little Missouri. Probably more rare on the drier plains beyond the Yellowstone, over

which it doubtless ranges sparingly to the base of the Rocky Mountains. Audubon, who first described this species, met with it in considerable abundance about Fort Union, near the mouth of the Yellowstone, in the summer of 1843. It was next taken on the Saskatchewan by Capt. Blackiston, and by Capt. J. P. McCown at Fort Randall, D. T., where Dr. Coues feels sure also of having seen it.[1] Dr. Coues also reports it as abundant on the prairies of the northern border of Dakota, where he obtained it in large numbers the past summer. Though it so long eluded observation after its discovery by Audubon, it seems to be a tolerably abundant species over a considerable area.

Audubon speaks of the resemblance of its habits to those of the European Sky-lark, and of the difficulty of obtaining specimens. In common with others, I sought for the bird at first on the ground, striving to locate it by its notes, which were finally found to originate from a point over our heads, so high in the air that the bird was almost invisible. Their notes resemble the syllables *jingle, jingle, jingle, jingle*, rapidly repeated, beginning loud and high, and decreasing rapidly in strength and loudness, and are remarkable for their clear metallic ring, their song reminding one of the jingling sound of a light chain when slowly let fall into a coil. They appear to sing only while on the wing, remaining often one-fourth to half an hour hovering over nearly the same spot, and so high as to be seen with great difficulty. They descend almost vertically, and with a rapidity so great that the eye can scarcely follow them, until within one or two hundred feet of the ground, when they scale off obliquely, and often finally alight at a considerable distance from the point over which they commenced to descend. When on the ground they run rapidly through the grass, and are thus difficult to find, as in attempting to flush them one never knows which way or where to look for them. When mounting to sing they rise rapidly in a wide spiral, with a bounding, very undulatory flight, and are thus soon out of reach.

The nest, as described by Audubon, is placed on the ground and very neatly formed of fine dry grass. The only one found by me was arched over, and being placed in a tuft of rank grass was most thoroughly concealed. The bird would seem to be a close sitter, as in this case the female remained on the nest till I actually stepped over it, she brushing against my feet as she flew off. The eggs, five in

[1] Am. Nat., Vol. VII, Nov., 1873, p. 697.

number, were rather long and pointed, being .90 of an inch in length by .60 in diameter. The ground color is a dull grayish white, thickly and quite uniformly covered with small blotches of purplish brown, giving to the eggs a decidedly dark purplish tint. In color the eggs thus somewhat resemble those of *Anthus ludovicianus*.

This species appears to migrate southward early in September, as very few were seen between the Yellowstone and the Missouri on our homeward march. Being necessarily migratory, and probably passing quite far southward, it seems strange that a bird so numerous should not have been before this met with during its migrations.

SYLVICOLIDÆ.

14. Mniotilta varia Vieill. Black-and-White Creeper.

A few were seen near Fort Rice, June 10th to 20th, and several specimens were taken.

15. Dendrœca æstiva Baird. Yellow Warbler.

Abundant along the Missouri and Heart Rivers, and frequent on the Musselshell and Yellowstone. Very generally distributed, being found also along all the streams wherever wooded. One of the most numerously represented of the woodland species.

16. Seiurus aurocapillus Swain. Golden-crowned Wagtail.

Abundant in the thickets and timbered bottom-lands in the vicinity of Forts Rice and A. Lincoln, and observed on Heart River, but not elsewhere on the trip.

17. Seiurus ?noveboracensis Nutt. Water Wagtail.

A water thrush, probably *S. noveboracensis*, was seen by Mr. Bennett at the Big Bend of the Musselshell.

18. Geothlypis trichas Cab. Maryland Yellowthroat.

More or less common along all the wooded streams, from the Missouri to the Musselshell, and quite abundant at favorable localities.

19. Geothlypis philadelphia var. **Macgillivrayi** All. Mourning Warbler.

Seen a few times along the Musselshell.

20. Icteria virens Baird. Yellow-breasted Chat.

Common in the woodlands along the Missouri, and observed at rare intervals on the Yellowstone and Musselshell; also seen on Heart River and the Little Missouri.

21. Setophaga ruticilla Sw. Redstart.

Quite common along the Missouri at Fort Rice in June, where it was apparently breeding. Not met with elsewhere.

A bird supposed to be *Dendrœca Auduboni*, was seen on two or three occasions (on Davis Creek, and near the mouth of the Big Horn River), but it eluding capture, it was not positively identified.

HIRUNDINIDÆ.

22. Hirundo horreorum Bart. Barn Swallow.

Occasional pairs met with throughout the district traversed, but it was nowhere common. Found it nesting under projecting rocks, against which the nest was plastered. Dr. Hayden has also reported its nesting "on the vertical sides of the bluffs along the Missouri,"[1] this being its normal mode of nesting doubtless everywhere prior to the occupation of this continent by the whites.

23. Tachycineta bicolor Cab. White-bellied Swallow.

Common at one locality on the Musselshell, but not seen elsewhere.

24. Tachycineta thalassina Cab. Violet-green Swallow.

First seen near the mouth of Tongue river, and frequently on the Yellowstone for some distance above this point.

25. Petrochelidon lunifrons Cab. Cliff Swallow.

Rather common. The most numerous and the most generally distributed of the Hirundines. A peculiar deviation from its usual mode of nesting, which was observed at some sandstone bluffs near the Yellowstone Crossing, seems worthy of note. The sandstone had weathered in such a manner as to leave the face of the bluff full of rounded cavities a few inches in diameter. Here a large colony of these swallows, instead of affixing their nests against the smooth face of the cliff, as they usually do, built them in these weatherworn holes. A few nests were built in the ordinary way, but most of them were formed by adding a neck to the holes already existing in the rocks! Some of them looked like nests imbedded in the cliff, with only the neck of the retort-shaped structure projecting. On another occasion I had an opportunity to note the breeding of this species in holes in banks, in the same manner as, and in company with, a large colony of sand martins.[2] At Fort Rice a colony had taken possession

[1] Trans. Am. Phil. Soc., XII, p. 161.

[2] Bull. Mus. Comp. Zool., Vol. III, p. 125.

of a bridge over a small creek for the location of their nests, attaching them to the sleepers of the bridge. The bridge was crossed almost constantly by heavy teams, which caused it to vibrate quite forcibly, yet the birds continued their work of nest building without interruption or apparent fear.

26. Cotyle riparia Boie. Bank Swallow. Sand Martin.

A colony seen breeding in the banks of the Great Porcupine Creek; young unfledged August 10th. Another large colony was met with on the banks of the Yellowstone, near the mouth of Custer's Creek. Here full-fledged young were obtained August 1st.

27. Cotyle serripennis Bon. Rough-winged Sand Martin.

A colony found breeding in a sand bluff near our crossing of the Big Muddy. A considerable number of nests, examined July 1st, all contained newly hatched young. This species was not positively identified as occurring elsewhere on the trip.

28. Progne subis Baird. Purple Martin.

More or less frequent along the Yellowstone, from the mouth of Tongue River to Pompey's Pillar, August 1st to 15th.

AMPELIDÆ.

29. Ampelis cedrorum Baird. Cedar Bird.

Seen at a few points on the Yellowstone, and quite common along the Musselshell, in consequence, doubtless, of the abundance here of choke cherries, buffalo berries and other small fruits.

VIREONIDÆ.

30. Vireo olivaceus Vieill. Red-eyed Vireo.

Common wherever there is timber, from the Missouri to the Musselshell.

31. Vireo gilvus Bon. Warbling Vireo.

Common, and generally distributed, occurring wherever there is timber.

LANIIDÆ.

32. Collurio ludovicianus var. **excubitoroides** Coues. Logger-head Shrike.

A few pairs were met with, widely scattered throughout the whole district traversed by the Expedition.

FRINGILLIDÆ.

33. Loxia americana Bon. Red Crossbill.

Quite frequent from the mouth of the Big Horn to Pompey's Pillar, and also on the Musselshell, in the vicinity of the pine covered bluffs, and ravines.

34. Chrysomitris tristis Bon. Yellow Bird. Goldfinch.

Observed at frequent intervals from the Missouri to the Yellowstone. Quite common along the better timbered portions of the larger creeks and rivers, particularly along the Musselshell and Yellowstone Rivers.

35. Plectrophanes ornatus Towns. Chestnut-collared Bunting.

Abundant from Fort Rice, on the Missouri River, to the Yellowstone. Rarely observed beyond the Yellowstone, only two or three individuals being seen during our whole march up the Yellowstone and across to the Musselshell and back. Seen about June 1st as far eastward as the James River. They are generally most abundant in the moister prairies, and in the vicinity of the streams. Everywhere between the Missouri and the Yellowstone one of the most abundant species of the plains.

The twelve sets of eggs collected present a very considerable amount of variation in form, size and color. The ground color is usually a clear grayish white, in one set varying to reddish. The markings are usually fine streaks and blotches of purplish brown or black, sometimes very few, at other times covering the greater part of the surface. In size and form they vary from .74 × .56 of an inch to .85 × .60.

In plumage the males of this species vary greatly. Generally the black of the lower parts is greatly obscured by the ashy edgings of the feathers, but in others these parts are pure intense black, while in still others they are more or less strongly tinged with bright rufous. One specimen (Orig. No. 60; S. I. No. 65, 116) has the feathers of the breast and middle of the abdomen broadly edged with bright rufous, representing typically the *P. melanomus*, which, as I have already shown,[1] and as is now generally admitted,[2] is merely a high state of plumage of *P. ornatus*. In the less brightly colored males the lesser wing coverts are brown; but as the general colors become

[1] Bull. Mus. Comp. Zool., III, 136.

[2] Coues, Key to N. Amer. Birds; Baird, Brewer and Ridgway, Hist. Birds North Amer.

heightened, these coverts become black, with the outer row tipped with white. One of the females also shows the rufous color strongly on the lower parts, which are almost as black as in some of the paler males. Another female is quite black below, but shows no red. Both have the nuchal collar strongly marked.

36. Plectrophanes Maccowni Bd. McCown's Bunting.

Seen in considerable abundance from the Missouri to the Yellowstone, but hardly so numerous nor so uniformly distributed as the *P. ornatus*. Sometimes very few were seen for twenty or thirty miles, and again they outnumbered any other species over a considerable area. Both this and *P. ornatus* seem to locate more or less in colonies, being here and there very numerous, and then almost entirely absent for miles.

In ascending the Yellowstone, about August 1st, this species, as well as *P. ornatus*, was very rarely seen; but a month later, on our way back, we began to meet with them in small flocks, which increased in size and number as the season advanced. A few small parties were seen on the Musselshell, and in crossing the divide between the Musselshell and the Yellowstone; but on again reaching the valley of the Yellowstone at the mouth of the Little Porcupine, we found them in flocks of hundreds, and even in some cases of thousands, of individuals. At the Yellowstone Crossing (Camp Thorne), where hardly one was seen in July, in September the prairies were alive with the immense flocks that had assembled from more or less distant points. Mixed with them were many *Eremophila alpestris* and a few *P. ornatus*, and occasionally a little party of *Anthus ludovicianus*. They were also frequent thence eastward to the Missouri River.

Three nests of this species were found, two of which contained five eggs each, and the other three. The nests were of course placed on the ground, and were formed of dry grass. The eggs are olive, or dull yellowish white, sparingly marked with small streaks and blotches of brown. The ground color varies from a dull soiled bluish white to cream color. Average size .80 by .60 of an inch. These are apparently the first really authentic eggs of this species known.

The plumage of this species is quite variable, even in the breeding season, the black of the breast in the males being sometimes pure and intense, and sometimes nearly concealed by the ashy edgings of the feathers, and the general colors vary in intensity in a corresponding

degree. The females sometimes wholly lack the chestnut on the wing-coverts, while in some it is nearly as bright as in average males.

37. Passerculus savanna var. ~~anthinus~~ Coues. Savanna Sparrow.

A single specimen was shot at Camp 56, on the Great Porcupine Creek, August 29th, where a few others were seen.

38. Poœcetes gramineus Baird. Grass Finch.

One of the most common and uniformly distributed species met with; particularly numerous in the valleys of the Yellowstone and the Musselshell.

39. Coturniculus passerinus var. **perpallidus** Ridgway. Yellow-winged Sparrow.

Common at intervals from the Missouri to the Musselshell, but apparently much more numerous over the comparatively moist prairies east of the Yellowstone than beyond it.

40. Centronyx Bairdii Baird. Baird's Sparrow.

Rather frequent in the moist hollows from the Missouri westward to the Little Missouri. Found by Audubon about Fort Union, and Dr. Elliott Coues reports it as abundant in Northern Dakota, west of the Pembina Mountains.[1] A single nest (the only one thus far known) was found by the writer July 1st, near Heart River, containing four eggs. The nest was a substantial structure of dry grass placed on the ground. The eggs are quite spherical, and of large size for the size of the bird, measuring .82 of an inch by .65. The color is pale grayish white, irregularly and quite thickly marked with specks and blotches of reddish brown, varying to dark umber.

41. Spizella socialis Bon. Chipping Sparrow.

More or less common along the wooded bottom-lands of the streams from the Missouri to the Musselshell; quite abundant also in August and September in the piny districts of the Yellowstone and Musselshell. They were chiefly young birds, which, with *Chondestes grammaca*, often formed considerable flocks.

42. Spizella pusilla Bon. Field Sparrow.

Frequent along Davis Creek, in the Bad Lands of the Little Missouri, but not observed elsewhere. No specimens were taken.

43. Spizella pallida Bon. Clay-colored Sparrow.

Common in the thickets bordering the streams from the Missouri nearly to the Yellowstone. In the valley of the Yellowstone, and to the westward, it seemed to be wholly replaced by the *S. Breweri*; at

[1] Am. Nat., Vol. VII, Nov., 1873, p. 697.

least no specimens of the true *pallida* type were taken, while the other form was abundant, the sage brush plains seeming to be its favorite haunts.

43*a*. Spizella pallida var. **Breweri** Coues. Brewer's Sparrow.

A common inhabitant of the sage brush everywhere; especially numerous in the valleys of the Yellowstone and Musselshell.

44. Chondestes grammaca Bon. Lark Finch.

One of the most abundant and generally diffused species, frequenting the edges of the wooded bottom-lands and the bushy ravines, but also found occasionally quite far out on the prairies.

45. Calamospiza bicolor Bon. Lark Bunting.

Very abundant at localities from near the Missouri to the valley of the Musselshell. Prefers wet prairies and bottom-lands near streams, where scores of pairs were sometimes found inhabiting a small area. I have often seen six or eight males hovering and singing in the air at once. Observed it first about fifty miles west of Fort Rice; saw it in the valley of the Yellowstone the first week in August, in considerable flocks, consisting mainly of young birds; but it disappeared entirely about the end of the month, being one of the earliest species to migrate.

In this species the colors are much less intense here than on the plains of Middle Kansas and Colorado, the black being more obscured by brownish edgings to the feathers, and more frequently mixed with brownish patches. This region probably forms nearly the northern limit of its distribution, it doubtless not extending its range much to the northward of the Upper Missouri.

The eggs of this species are very variable in respect to size, form and depth of color. Some twenty sets were collected, varying in color from pale bluish white to quite deep blue. The average dimensions may be given as .90 by .73 of an inch, the variation ranging from .80 to .95 of an inch in length, and .63 to .75 of an inch in diameter. The considerable variation in form is indicated by the following extremes of proportions: .80 × .73, .95 × .65, and .86 × .63. The nest varies from a very slight to a quite bulky and substantial structure.

This species proves to be one of the favorite foster-parents of the cow bird (*Molothrus pecoris*). In a series of eighteen nests, five, or nearly one-third, contained eggs of the cow bird, two even containing two each, and one had three; while out of twenty-nine nests of

other ground-nesting prairie birds, collected at the same time and over the same area, *not one* contained an egg of the cow bird!

46. Euspiza americana Bon. Black-throated Bunting.

Occasional along the bushy ravines from Fort Rice westward to the Bad Lands of the Little Missouri.

47. Goniaphea melanocephala Bowd. Black-headed Grosbeak.

Observed at frequent intervals along the wooded portions of the streams from the Missouri to the Yellowstone.

48. Cyanospiza amœna Baird. Western Indigo Bird. Lazuli Finch.

Quite abundant on the Missouri at Fort Rice, and met with occasionally thence westward throughout our journey.

49. Pipilo maculatus var. **arcticus** Coues. Arctic Towhee.

A common inhabitant of the wooded bottom-lands everywhere. Heard a few whose songs were undistinguishable from the songs of *P. erythrophthalmus*. A single individual seen on Davis Creek could not be distinguished in appearance, though but three or four yards distant, from the true *P. erythrophthalmus*.

ICTERIDÆ.

50. Dolichonyx oryzivorus Sw. Bobolink.

A few were seen at distant intervals about midway between the Missouri and Yellowstone,— not more than half a dozen in all,—and none were met with elsewhere. Dr. Hayden reports it as common about Fort Pierre, but states that he "never observed it high up towards the sources of the Missouri."[1]

51. Molothrus pecoris Swain. Cow Bird.

Abundant and very generally diffused. Its eggs occurred in nearly one-third of the nests of the lark bunting we found, in one instance three, and in several instances two, being found in the same nest. They thus form no inconsiderable check upon the increase of this bird; but in no instance were their eggs found in the nests of the other prairie birds.

52. Agelæus phœniceus Vieill. Red-winged Blackbird.

Met with only at distant intervals, and nowhere in considerable numbers. Not observed either on the Musselshell or the Yellowstone.

[1] Trans. Am. Phil. Soc., XII, p. 169.

53. Xanthocephalus icterocephalus Baird. Yellow-headed Blackbird.

Seen but three or four times on the whole journey. A small colony found breeding near the point where we crossed the Big Muddy, and a single small flock seen near the head of the Great Porcupine Creek. A small flock seen once also on Heart River.

54. Sturnella ludoviciana var. **neglecta** All. Meadow Lark.

One of the most abundant birds of the plains, occurring everywhere. No other bird, perhaps, is so uniformly met with.

The following are some of the variations in the size and color of the eggs of this species: Extremes, 1.25 × .81 inches, and 1.02 × .81 inches. Two eggs of the same set varied as follows: 1.20 × .90; 1.02 × .80. The markings vary from pale diffused rufous blotches to sharply defined small dark purplish brown or black specks. One set of eggs presents an almost exact likeness in size, shape and color to the eggs of the whippoorwill.

55. Icterus spurius Bon. Orchard Oriole.

A few pairs seen near the "Second Crossing" of Heart River, July 5th, were the only ones met with.

56. Icterus Bullocki Bon. Bullock's Oriole.

More or less frequent along all the wooded portions of the streams. Observed at Fort Rice and on the Heart River; collected on Beaver Creek, on the Yellowstone at the Crossing, and at the Big Bend of the Musselshell. Dr. W. J. Hoffman, U. S. A., informs me that it is common at the Grand River Agency and at Fort Randall. Dr. Hayden says this species "seldom passes above Fort Pierre," but that "it occurs occasionally along the Lower Missouri." He speaks of having met with but one specimen in all his explorations. On the other hand, he gives *I. Baltimore* as "abundant throughout the wooded portion of the Missouri country," and as "more common on the numerous islands in the river, from the mouth to Fort Union,"[1] while not a single specimen was seen by us west of the Missouri.

57. Scolecophagus cyanocephalus Cab. Brewer's Blackbird.

Common along all the timbered portions of the streams everywhere. In September seen in immense flocks along the Yellowstone and Heart Rivers. I observed large flocks in Dakota, as far east even as the James River.

[1] Trans. Am. Phil. Soc., XII, p. 170.

58. Quiscalus purpureus Licht. Crow Blackbird. Purple Grakle.

Abundant on the Missouri at Fort Rice, common along Heart River, and on the Yellowstone as far up as we ascended. Very abundant about the mouth of Tongue River.

CORVIDÆ.

59. Corvus corax Linn. Raven.

More or less common from the Missouri to the Musselshell, being seen almost daily, but nowhere very numerous. Seen on the divide, between the two Porcupine Creeks, far out on the naked barren ridges in the Bad Lands.

60. Corvus americanus Aud. Common Crow.

Common wherever there is timber. Contrary to what is usually supposed, we found the ravens quite common where the crows were very abundant. Quite large flocks of crows and small parties of ravens were frequently in sight along the Yellowstone at the same time, there being apparently no hostility nor antipathy between them. We robbed a raven's nest July 5th, near the Heart River, within hearing of a large flock of crows that had assembled a few hundred yards distant in the timber, to celebrate, apparently, some great occasion.

61. Pica caudata var. **hudsonica** All. Magpie.

Not common. A few seen at distant intervals throughout the journey.

TYRANNIDÆ.

62. Tyrannus carolinensis Bd. King Bird. Bee Martin.

Very common along all the wooded portions of the streams. One of the most common of the woodland birds. Seen frequently after the breeding season far out among the sage brush on the plains. Departs for the south during the last week in August.

63. Tyrannus verticalis Say. Arkansas Flycatcher.

Exceedingly abundant wherever there is timber, far outnumbering even so common a bird as the *T. carolinensis*, and more numerous than any other of the tree-nesting species. After the breeding season seen far away from the timber among the sage brush. This, like the preceding species, disappeared about the end of August.

64. Sayornis Sayus Bd. Say's Flycatcher.

During the breeding season only solitary pairs were seen, usually

at intervals of several days, generally in the Bad Lands, or about rocky buttes. Found two or three nests, but they all contained young birds. The nests were placed under projecting ledges of rock, in broken or precipitous places. Later in the season the species was more frequently observed, sometimes in small parties of four or five together.

65. Contopus virens var. **Richardsoni** All. Richardson's Pewee.

Seen at various points along the Yellowstone and Musselshell.

66. Empidonax minimus Baird. Least Flycatcher.

Common in the timbered bottom-lands of the Missouri at Fort Rice, frequenting the more open parts of the woodland, where fires had killed the underbrush. A few were seen also on Heart River, but neither this nor any other species of *Empidonax* was met with elsewhere during the whole journey.

CAPRIMULGIDÆ.

67. Antrostomus Nuttalli Cass. Nuttall's Whippoorwill.

A few individuals seen in the pine ridges and ravines along the Musselshell.

68. Chordeiles popetue var. **Henryi** All. Western Nighthawk.

Everywhere quite common.

CYPSELIDÆ.

69. Chætura pelasgia Steph. Swift.

Common along the Missouri at Fort Rice; seen elsewhere only on the Yellowstone, near the mouth of Tongue River, where the hollow trees of the heavy cottonwood forests doubtless afford them the necessary breeding sites.

ALCEDINIDÆ.

70. Ceryle alcyon Boie. Kingfisher.

Two or three individuals, observed on the Musselshell, were all that were seen during the whole journey. Their absence is readily explained by the turbid state of the streams, in which it would be impossible for them to discover their finny prey, however abundant it might be.

CUCULIDÆ.

71. Coccygus americanus Bon. Yellow-billed Cuckoo.

This species was several times observed along Heart River and either this or *C. erythropthalmus* in the valley of the Yellowstone. Dr. Hayden speaks of having both species in his Nebraska collections.[1]

PICIDÆ.

72. Picus villosus var. **Harrisi** All. Hairy Woodpecker.

Occasional in the forests of the Yellowstone and Musselshell.

73. Picus pubescens var. **Gairdneri** Coues. Downy Woodpecker.

More or less frequent along the more heavily wooded portions of the streams, from the Missouri to the Musselshell.

74. Sphyrapicus varius var. **nuchalis** All. Yellow-bellied Woodpecker.

Seen only on the Musselshell, where several specimens were taken.

75. Melanerpes erythrocephalus Swain. Red-headed Woodpecker.

Abundant everywhere from the Missouri to the Musselshell, far outnumbering all the other *Picidæ* together.

76. Colaptes "auratus." Yellow-shafted Flicker.

Obtained in the vicinity of Fort Rice, and seen occasionally westward to the Musselshell.

77. Colaptes "mexicanus." Red-shafted Flicker.

The most prevalent form of *Colaptes*, but by no means numerous, and very hard to approach. On the Great Porcupine Creek I shot a series of specimens that present a very interesting gradation from the "*mexicanus*" to the "*auratus*" type. Throughout this region the two forms associate together, and a considerable portion of them present an interesting combination of the characters of the two forms.

A female collected at Fort Rice is scarcely different from the usual form of *C.* "*auratus*." A young male, collected on the Big Knife River, also scarcely differs from the ordinary style of *C.* "*auratus*." Other specimens, collected along the Yellowstone and Musselshell Rivers, more or less strongly resemble the *C.* "*mexicanus*," one of them typically representing that form, while of the rest each presents a different and intermediate stage between the two types.

[1] Trans. Am. Phil. Soc., XII, p. 155.

STRIGIDÆ.

78. Bubo virginianus Bon. Great Horned Owl.

Occasional.

79. Otus vulgaris var. **Wilsonianus** All. Long-eared Owl.

Occasional. Two specimens obtained.

80. Brachyotus palustris Bon. Short-eared Owl.

Apparently the most common of the Owls. Seen a few times far out on the prairies, many miles from timber.

81. Syrnium nebulosum Gray. Barred Owl.

Met with on the Missouri at Fort Rice, and on the Yellowstone and Musselshell.

82. Speotyto cunicularia var. **hypogæa** Coues. Burrowing Owl.

Not numerous; met with at intervals, in the prairie-dog towns, from the Little Missouri westward.

FALCONIDÆ.

83. Circus cyaneus var. **hudsonius** All. Marsh Hawk.

Rare in the breeding season; more common in August and September.

84. Accipiter Cooperi Bon. Cooper's Hawk.

One was taken August 8th, near the mouth of the Little Porcupine, and a few others were seen later in the season. Rare.

85. Falco communis var. **anatum** Ridg. Duck Hawk.

Seen but once or twice, near the Great Bend of the Musselshell.

86. Falco columbarius Linn. Pigeon Hawk.

Seen at distant intervals on the Yellowstone and Heart Rivers, in September.

87. Falco sparverius Linn. Sparrow Hawk.

Very abundant along the timbered portion of the streams everywhere. Ten times more numerous than all the other *Falconidæ* together.

88. Buteo borealis Vieill. Red-tailed Hawk.

Occasional along the more heavily timbered portions of the bottomlands.

89. Buteo Swainsoni Bon. Swainson's Hawk.

More or less common, doubtless, where there is timber. Obtained an adult male on Heart River, June 25th.

90. Archibuteo ferrugineus Gray. Western Rough-legged Hawk.

Next to *Falco sparverius*, the most common species of the *Falconidæ*; yet it was seen only at distant intervals. Several nests were found containing young. The nest is often a very large bulky structure, sometimes three or four feet in diameter, built of coarse sticks, mixed with the ribs of antelopes and buffalos. It is placed on the ground or rocks, usually near the summit of isolated buttes. The same nest is apparently occupied for a series of years and annually repaired.

91. Aquila chrysaëtos Linn. Golden Eagle.

Occasional. A young one was captured by some soldiers of the 7th Cavalry on Heart River.

92. Haliaëtus leucocephalus Savig. White-headed Eagle. Bald Eagle.

Seen only at rare intervals along the Yellowstone and Musselshell Rivers.

CATHARTIDÆ.

93. Cathartes aura Ill. Turkey Buzzard.

Seen at intervals all the way from the Missouri to the Yellowstone, rarely more than two or three together, and generally singly. Quite a number, however, finally assembled around Camp Thorne, attracted, doubtless, by the offal from the beeves slaughtered for the support of the garrison stationed there during the absence of the main expedition up the Yellowstone.

COLUMBIDÆ.

94. Zenædura carolinensis Bon. Carolina Dove.

Abundant everywhere, particularly near the streams. A few nests met with, which were invariably placed on the ground.

TETRAONIDÆ.

95. Centrocercus urophasianus Sab. Sage Cock. Cock-of-the-plains.

More or less common along the Yellowstone and Musselshell Rivers, but large flocks met with only a few times. None seen east of the Little Missouri.

96. Pediœcetes phasianellus var. **columbianus** Coues. Sharp-tailed Grouse.

Occasional in the vicinity of all the larger streams from the Missouri to the Musselshell, but nowhere very numerous. Young hatched the last week in June.

CHARADRIIDÆ.

97. Ægialitis vociferus Cass. Killdee Plover.

Single pairs met with at intervals throughout our journey. Far less numerous than on the plains of Kansas, Colorado, and Southern Wyoming. Sometimes none were seen for several days.

98. Ægialitis montanus Cass. Mountain Plover.

Met with at widely distant intervals. Seen more frequently on the plains bordering the Yellowstone and Musselshell than elsewhere. Two or three small flocks were met with in September, but generally they were seen only in single pairs at intervals of several days.

RECURVIROSTRIDÆ.

99. Recurvirostra americana Gmel. Avoset.

Three or four pairs were seen about a rain-water pool on the divide between the Yellowstone and Musselshell (near Camp 46), August 18th — the only time the species was met with on the whole journey.

SCOLOPACIDÆ.

100. Tringa ? Bairdii Coues. Baird's Sandpiper.

A few individuals were seen along the Musselshell, which were supposed to be of this species, but no specimens were taken. It was also seen a few times in September along the Yellowstone.

101. Totanus solitarius Wils. Solitary Sandpiper.

Observed frequently along the Musselshell and Yellowstone Rivers. First seen July 28th, on a little creek not far from Camp Thorne.

102. Totanus melanoleuca Gm. Greater Tattler.

Occasional along the Musselshell, and seen a few times on the Yellowstone and Heart Rivers in September.

103. Tringoides macularius Gray. Spotted Sandpiper.

Not common. Seen at unfrequent intervals from the Missouri to the Musselshell.

104. Actiturus Bartramius Bon. Bartram's Plover. Upland Plover.

Very common on the prairies east of the Yellowstone, and seen at frequent intervals throughout our journey. Outnumbers all the other *Grallæ* together. Nests found with fresh eggs from June 14th to July 15th.

105. Numenius longirostris Wilson. Long-billed Curlew.

A few pairs met with at quite distant intervals from the Missouri to the Musselshell.

ARDEIDÆ.

106. Ardea herodias Linn. Blue Heron.

A single specimen seen on Heart River — the only representative of the family seen on the journey.

GRUIDÆ.

107. Grus canadensis Temm. Brown Crane.

A large flock seen at the crossing of the Little Missouri, September 15th, circling over our camp high in the air; the only time that the species was observed.

RALLIDÆ.

108. Rallus virginianus Linn. Virginia Rail.

Met with once or twice in June near the Heart River.

109. Fulica americana Gmel. Coot.

Not common.

ANATIDÆ.

110. Branta canadensis Scop. Canada Goose.

Quite frequent along the Yellowstone and Musselshell. Breeds.

~~PODICIPIDÆ.~~

111. Anas boschas Linn. Mallard.

Not common. Seen on Beaver Creek and Heart River in September.

112. Querquedula carolinensis Steph. Green-winged Teal.

A few pairs met with at distant intervals during the breeding season, and a few small flocks seen in September mixed with *Q. discors*.

113. Quequedula discors Steph. Blue-winged Teal.

Met with occasionally in the breeding season, and a few small flocks seen in September.

114. Spatula clypeata Boie. Shoveller. Spoon-billed Duck.

Two or three shot near the head of Heart River in September. No others observed.

115. Aix sponsa Boie. Wood Duck.

More or less frequent on the Missouri, near Forts A. Lincoln and Rice, but not met with elsewhere.

116. Mergus cucullatus Linn. Hooded Merganser.

Met with near the head of Heart River about July 1st, and also in September, but not seen elsewhere.

PELECANIDÆ.

117. Pelecanus trachyrhynchus Lath. White Pelican.

One specimen obtained at Camp Thorne, September 12th. Said to be common on the Missouri in June, a few miles below Fort Rice.

118. Podiceps auritus var. **californicus** Coues. Eared Grebe.

A single specimen was obtained on the Yellowstone, near the mouth of Tongue River, September 2d, and four or five others were seen on the Great Porcupine Creek.

IV. Report on the Reptiles.

Reptilian life is extremely scarce throughout the region traversed by the Expedition, there being but two species very numerously represented, or very generally dispersed. These are the *Caudisona confluenta* and the *Phrynosoma Douglassi*. The first not only outnumbers all the other Ophidians, but all the other reptiles, excluding the *Phrynosoma Douglassi*, which may possibly exceed in numbers the *Caudisona confluenta*.

The *Aspidonectes spinifer*, which is more or less frequent in the large streams, is apparently almost the sole representative of the Testudinata, as *Phrynosoma Douglassi* is also almost the only representative of the Lacertilia.

TESTUDINATA.

1. Chrysemys oregonensis Agass.

A few individuals were seen near Fort Rice, and in the vicinity of Heart River, near pools of water in the prairies.

2. Aspidonectes spinifer Agass.

Frequent in both the Musselshell and Yellowstone Rivers, and also seen in some of the smaller streams.

LACERTILIA.

3. Sceloporus consobrinus B. & G.

A single specimen was taken on the Yellowstone, near Camp Thorne, and a few others were seen. Apparently quite rare.

4. Phrynosoma Douglassi Wagl.

Occasional throughout the region traversed, but very common only at a few localities.

OPHIDIA.

5. Caudisona confluenta (Say).

Common, especially in the Bad Lands of the Little Missouri and along the Yellowstone. This species many times outnumbers all the other Ophidians together. Several hundred were killed by the different members of the Expedition, but notwithstanding its abundance the only casualty resulting from it was one horse bitten. On the Expedition of 1872 they were found in much greater abundance than on the present one. It was estimated that on the Expedition of 1872 not less than *two thousand* were killed, and yet not a man nor an animal was bitten by them. This shows how little danger there really is from them, even when numerous. Man is a far more fatal enemy to the snake than the snake is to man. I was surprised to find how late in the season they are found abroad, as we met with them quite frequently after several severe frosts had occurred. During July two pairs were found *in coitu*, indicating the season at which they pair.

6. Bascanion flaviventris B. & G.

Two specimens were taken in the valley of the Yellowstone, near Camp Thorne, and only two or three others were seen.

7. Pityophis bellona B. & G.

A single specimen taken at the mouth of Custer's Creek, Sept. 1st, was the only one seen.

8. Heterodon nasicus B. & G.

A specimen was taken near the head of Heart River, and another in the valley of the Yellowstone; one or two others were observed.

9. Eutænia proxima B. & G.

Not common. Less than half a dozen representatives of the genus *Eutænia* seen on the whole trip.

V. Report on the Batrachians.

As would be anticipated from the great aridity of the climate, the Batrachians are very sparsely represented in the district traversed by the Expedition. The *Rana halecina* is by far the most common species, but is yet comparatively scarce, and, with *Bufo columbinensis*, forms the only representative of the class that can be regarded as at all frequent.

ANURA.

1. Bufo columbiensis B. & G.

Occasional, but far from common.

2. Spea bombifrons Cope.

A single specimen, collected by Mr. Bennet at Camp Thorne, was the only one seen.

3. Rana halecina Kalm.

Rather frequent along the streams, and quite generally dispersed.

URODELA.

4. Amblystoma mavortium Baird.

A specimen was obtained at Fort A. Lincoln, and it was once or twice seen in the valley of the Yellowstone. This was the only representative of the tailed batrachians seen.

VI. Report on the Plants.

For the identification of the species of the following list of plants I am indebted to Dr. Geo. Vasey, Botanist of the Department of Agriculture, to whom the collection was referred for determination. I have added a few species from my notes that were not contained in the collection, which are distinguished by the names being enclosed in brackets. The collection was begun at Fort Rice, about June 12th, and was continued throughout the journey, or till about September 15th. Many of the species collected were confined to the vicinity of the large streams, as were nearly all the species of *Ranunculaceæ* met with, while others were as exclusively inhabitants of the dryest portions of the Plains. The difference between the flora of the vicinity of Fort Rice and that of the divide between the Yellowstone and Musselshell Rivers is very great. The general features of the country through which we passed, and of its flora, have already been

given in the Introduction; but a few additional remarks may be added here. As compared with the flora of Northern Kansas, situated seven or eight degrees further south, the contrast is very great, while the general features of the landscape, aside from the flora, of the region east of the Yellowstone, and especially east of the Little Missouri, are not essentially different from those of the prairies of Middle Kansas. Gently rolling grassy prairies characterize both regions, but while in Kansas the landscape, during early summer, is everywhere varied with differently tinted patches of bright color, from the abundance of the flowers, and from those of the same species growing together in masses, in central Dakota we miss entirely this effect, the flowers being not only far less numerous in species, but those of a given species are so few as rarely to give their own tint to extended portions of the landscape. Such social species, for instance, as the *Malvastrum coccineum*, which on the Kansas prairies sometimes covers acres with its bright flowers, almost to the exclusion of other species, occurs here apparently only as a straggler, a few individuals in a place, of small size, and never forming masses of color sufficient to particularly attract the attention. The same is true of many other species; the absence of this marked grouping of the brightly colored species, resulting evidently from their paucity of representatives, being here as much a floral characteristic of these northern prairies as the presence of this grouping is on the prairies of Kansas. Further remarks on the distribution of particular species are incorporated with the list.

RANUNCULACEÆ.

1. **Clematis ligusticifolia** Nutt. Collected on the Yellowstone at the mouth of Big Porcupine Creek, August 8th. Noticed in considerable abundance at other localities along the Yellowstone and its tributaries.

1*a*. **Clematis ligusticifolia** var. *β*. Collected with the preceding.

2. **Anemone patens** var. **Nuttalliana** Gray. Wooded bottom-lands of the Missouri at Fort Rice, June 15th. Abundant.

3. **Anemone Pennsylvanica** Linn. Abundant at Fort Rice, with the preceding.

4. **Thalictrum Fendleri** Eng. In moist wooded bottom-lands at Fort Rice. Common.

5. **Ranunculus aquatilis** var. **heterophyllus** D. C. Crossing of the Big Muddy, July 1st.

CRUCIFERÆ.

6. Erysimum Arkansanum Nutt. Crossing of the Big Muddy, July 1st. A common prairie species from the Missouri to the Yellowstone.

7. Erysimum asperum var. **inconspicuum** S. Watson. Crossing of the Big Muddy, July 1st.

8. Vesicaria Ludoviciana D. C. Prairies, west of Fort Rice, June 22d.

9. Physaria didymocarpa Gray. Valley of the Little Missouri, at the mouth of Davis Creek, July 10th.

10. Lepidium Virginicum L. Valley of the Little Missouri, July 10th.

CAPPARIDACEÆ.

11. Polanisia uniglandulosa D. C. Shell Point, Yellowstone River, July 16th. Abundant in sandy places.

12. Cleome integrifolia Nutt. Valley of the Musselshell, August 20th. Common.

CARYOPHYLLACEÆ.

13. Cerastium arvense Linn. Valley of the Musselshell.

14. Paronychia sessiliflora Nutt. Near the Big Muddy, July 3d.

MALVACEÆ.

15. Malvastrum coccineum Gray. Sparingly on the prairies from Fort Rice to the Yellowstone, June 18th, and later. Also found in blossom in the bottom lands of the Yellowstone, August 8th, where the growth of this and other plants had been retarded by the spring overflow of the river.

LINACEÆ.

16. Linum sulcatum Riddell. Crossing of the Big Muddy, July 1st. Seen also on Heart River, but not common.

17. Linum perenne L. Abundant on the dry plains and prairies everywhere, varying greatly in size and appearance at different localities.

ANACARDIACEÆ.

18. Rhus toxicodendron Linn. Along the Missouri at Fort Rice, and also on Heart River.

VITACEÆ.

19. Vitis cordifolia Michx. Heart River, June 24th. Also on the Yellowstone, a short distance below Pompey's Pillar.

20. Ampelopsis quinquefolia Michx. Heart River, June 24th.

CELASTRACEÆ.

21. Celastrus scandens L. Heart River, June 24th.

ACERACEÆ.

22. Negundo aceroides Mœnch. One of the most common trees along all the streams from the Missouri to the Musselshell. This and the cottonwood (*Populus monolifera*) constitute the only trees met with at many localities.

POLGALACEÆ.

23. Polygala alba Nutt. Common on the moister prairies, from Fort Rice westward.

LEGUMINOSÆ.

24. Lupinus pusillus Pursh. Common on the prairies between the Missouri and Little Missouri Rivers.

25. Psoralea floribunda Nutt. Yellowstone Valley, at mouth of Little Porcupine Creek, August 7th.

26. Psoralea lanceolata Pursh. Moist bottom-land of the Missouri, at Fort Rice, June 15th.

27. Psoralea argophylla Pursh. Great Bend of Heart River, July 24th.

28. Psoralea esculenta Pursh. Near Fort Rice, June 20th.

29. Hosackia Purshiana Benth. Prairies west of Little Missouri, July 11th.

30. Petalostemon candida Michx. Common on the prairies from the Missouri to the Yellowstone.

31. Petalostemon violaceum Michx. With the preceding, and equally common.

32. Lathyrus ochroleucus Hook. Fort Rice, June 15th.

33. Lathyrus linearis Nutt. Bottom-lands of the Missouri at Fort Rice, June 15th. Abundant.

34. Vicia Americana Muhl. Fort Rice, June 16th. Common.

34*a*. Vicia Americana Muhl., var. Valley of the Little Missouri, at mouth of Davis Creek, July 10th.

35. Astragalus lotiflorus Hook. Near Heart River, July 7th.

36. Astragalus Nuttallianus D. C. Near Heart River, July 7th.

37. Astragalus racemosus Pursh. Heart River Crossing, June 26th.

38. Astragalus Plattensis Nutt. Fort Rice, June 13th.

39. Astragalus adsurgens Pall. Heart River Crossing, June 26th.

40. Astragalus aboriginum Rich. Heart River Crossing, June 26th.

41. Astragalus bisulcatus Gray. Head of Heart River, July 8th.

42. Oxytropis Lamberti Pursh. Fort Rice, June 13th.

43. Glycyrrhiza lepidota Nutt. Mouth of Little Porcupine Creek, August 4th.

44. Amorpha fruticosa Linn. Heart River Crossing, June 26th. A rather common shrub along the streams.

45. [**Amorpha canescens** Nutt.] Common on the prairies.

46. Amorpha microphylla Pursh. Heart River Crossing, June 26th. Common only at a few localities.

ROSACEÆ.

47. Prunus Virginiana Linn. Fort Rice, June 15th. A common shrub along all the streams, from the Missouri to the Musselshell, and on the tributaries of the Little Missouri and Heart Rivers, but not frequent on the Yellowstone, between Glendive Creek and Pompey's Pillar.

48. Prunus pumila Linn. Near the Great Bend of Heart River, June 24th.

49. Potentilla arguta Pursh. Crossing of the Big Muddy, June 30th.

50. Potentilla Pennsylvanica Linn., var. Head of Heart River, July 8th.

51. Potentilla anserina Linn. Bad Route Creek, near the Yellowstone, July 28th.

52. Potentilla gracilis Dougl., var. Head of Heart River, July 8th.

53. Potentilla fruticosa Linn. Heart River Crossing, June 25th.

54. Rosa blanda Ait. Prairies west of Fort Rice, June 22d. Abundant on the prairies almost everywhere, thence westward to the

Yellowstone. Varies in height from a few inches to three feet, according to locality.

55. [**Cratægus coccinea** Linn.] Occasional along the banks of the streams.

56. Amelanchier Canadensis T. and G. Heart River Crossing, June 25th. Widely dispersed, but not common anywhere.

ONAGRACEÆ.

57. Epilobium paniculatum Nutt. Bad Route Creek, July 28th.

58. Gaura coccinea Nutt. Heart River, July 6th.

59. Œnothera biennis Linn. Bad Route Creek, July 28th.

59*a*. Œnothera biennis Linn., var. Head of Heart River, July 8th.

60. Œnothera albicaulis Nutt. Head of Heart River, July 28th.

61. Œnothera serrulata Nutt. Second Crossing of Heart River, July 6th.

62. Œnothera pinnatifida Nutt. Great Bend of Heart River, June 23d.

63. Œnothera cæspitosa Nutt. Near Fort Rice, June 20th.

LOASACEÆ.

64. Mentzelia nuda Linn. Shell Point, Yellowstone River, July 16th.

CACTACEÆ.

65. [**Opuntia Missouriense** D. C.] Common at Fort Rice, and increasing in abundance westward. In the Yellowstone Valley, and between the Yellowstone and Musselshell Rivers it often nearly covers the ground for large distances.

66. [**Opuntia fragilis** Nutt.] More or less common on the prairies west of Fort Rice, but increases in abundance westward, in places nearly covering the ground, and though smaller, is far more troublesome to animals in traveling than the preceding species.

67. [**Mamillaria vivipara** Nutt.] Common throughout the region traversed.

GROSSULACEÆ.

68. Ribes aureum Pursh. Occurs sparingly along the streams everywhere, from the Missouri to the Musselshell; most abundant in the valley of the Musselshell.

69. Ribes rotundifolium Michx. Abundant in the valley of the Musselshell, and occurs sparingly along the streams elsewhere.

70. [Ribes hirtellum Michx.] Dry rocky places, head of Heart River to the Musselshell.

CUCURBITACEÆ.

71. [Echinocystis lobata T. and G.] Near Fort Rice, June 20th.

SAXIFRAGACEÆ.

72. Heuchera hispida Pursh. Near Fort Rice, June 20th.

UMBELIFERÆ.

73. Sanicula Marylandica Linn. Shell Point, Yellowstone River, July 16th.

74. Peucedanum nudicaule Nutt. Fort Rice, June 15th.

75. Musenium divaricatum Nutt. Crossing of the Big Muddy, June 30th.

76. Sium angustifolium Linn. Yellowstone River, near Shell Point, July 25th.

CORNACEÆ.

77. Cornus stolonifera Michx. Fort Rice, June 15th.

CAPRIFOLIACEÆ.

78. Symphoricarpus occidentalis R. Br. Abundant near all the streams, and in the moist ravines everywhere.

RUBIACEÆ.

79. Galium boreale Linn. Near Fort Rice, June 22d. Common in the bottom-lands of the Musselshell and other streams.

COMPOSITÆ.

80. Liatris punctata Hook. Yellowstone, fifteen miles below the Big Horn River, August 11. A common species over a wide area.

81. Aster oblongifolius Nutt. Near Pompey's Pillar, August 13th.

82. Aster multiflorus Ait. Valley of the Musselshell, August 19th.

83. Aster lævis Linn. Near Pompey's Pillar, August 14th.

84. Aster tenuifolius Linn. Near Pompey's Pillar, August 14th.

85. Aster falcatus Lindl. Valley of the Musselshell, August 24th.

86. Macærantha tanacetifolia Nees. Valley of the Yellowstone, twenty-seven miles above Tongue River, August 6th.

87. Macærantha canescens Gray. Valley of the Yellowstone, near the mouth of Tongue River, August 6th.

88. Erigeron pumilum Nutt. Fort Rice, June 13th.

89. Erigeron Canadense Linn. Valley of the Musselshell, August 21st.

90. Solidago rigida Linn. Valley of Musselshell, August 21st.

91. Solidago nemoralis Ait. Bottom-lands of the Musselshell River, August 21st.

92. Solidago gigantea Ait. Bottom-lands of the Musselshell River, August 21st. Abundant.

93. Lynosyris graveolens T. and G. Valley of the Musselshell, August 21st. An abundant species over a wide area.

94. Lynosyris graveolens T. and G., var. Near Shell Point, Yellowstone River, July 27th.

95. Lynosyris viscidiflora Hook. Musselshell River, August 21st.

96. Grindelia squarrosa Duval. Valley of the Yellowstone, August 1st.

97. Aplopappus Nuttalli D. C. Head of Heart River, July 8th.

98. Aplopappus spinulosus D. C. Beaver Creek, July 13th.

99. Chrysopsis villosa Nutt. Yellowstone, near mouth of Custer's Creek, August 1st.

100. Iva axillaris Pursh. Crossing of Big Muddy, June 30th.

101. Iva ciliata Wild. Yellowstone, near mouth of Big Horn River, August 11.

102. Xanthium strumarium Linn. Yellowstone, near the mouth of the Little Porcupine Creek, August 7th.

103. Echinacea angustifolia D. C. Abundant on the prairies between the Missouri and Yellowstone.

104. Lepachys columnaris Raf. Bad Route Creek, July 28th.

105. Helianthus pumilis Nutt. Divide between the Musselshell and Yellowstone, west of Pompey's Pillar, August 18th.

106. Helianthus lenticularis Dougl. Musselshell and Yellowstone divide, August 18th.

107. Helianthus petiolaris Gray. Near Pompey's Pillar, August 16th.

108. Helianthus Maximiliani Schrœd. Valley of the Musselshell, August 20th.

109. Coreopsis tinctoria Nutt. Found only at one small locality, a few acres in extent, on a moist prairie near Beaver Creek, July 13th.

110. Dysodia chrysanthemoides Lag. Shell Point, Yellowstone River, July 21st.

111. Gallardia aristata Pursh. Near Fort Rice, June 20th.

112. Hymenopappus tenuifolius Pursh. Second Crossing of Heart River, July 6th.

113. Actinella acaulis Nutt. Near Heart River, June 26th.

114. Actinella Richardsoni Nutt. Head of Heart River, July 8th.

115. Achillea millefolium Linn. Crossing of the Big Muddy, June 30th. Occurs sparingly from the Missouri to the Musselshell.

116. Artemisia dracunculoides Pursh. Valley of the Musselshell, August 21st.

117. Artemisia Canadensis Michx. Custer's Creek, September 6th. Abundant in the valley of the Yellowstone and in the bad lands.

118. Artemisia Ludoviciana Nutt., var. Musselshell Valley, August 21st. Abundant throughout the bad lands, and in the valleys of the Musselshell and Yellowstone.

119. Antennaria dioica Gærtun. Heart River, June 24th.

120. Senecio lugens Rich., var. Fort Rice, June 13th.

121. Senecio canus Hook. Crossing of Big Muddy, July 1st.

122. Senecio aureus Linn. Near Fort Rice, June 20th.

123. Arnica angustifolia Vohl. Fort Rice, June 13th.

124. Circium undulatum Spreng. Bad Route Creek, July 28th.

125. Circium Virginianum Michx., var. Valley of the Musselshell, August 24th.

126. Lygodesmia juncea Don. Shell Point, Yellowstone River, July 22d.

127. Troximon cuspidatum Pursh. Near Fort Rice, June 20th.

128. Macrorhynchus glaucus Eaton. Near Fort Rice, June 20th.

129. Mulgedium pulchellum Nutt. Near Shell Point, Yellowstone River, July 24.

CAMPANULACEÆ.

130. Campanula rotundifolia Linn. Near Fort Rice, July 24th. Occasional westward, on the prairies.

PLANTAGINACEÆ.

131. Plantago pusilla Nutt. Crossing of Big Muddy Creek, June 30th.

132. Plantago Patagonica Jacq., var. Crossing of the Big Muddy, June 30th. Very abundant and widely dispersed.

PRIMULACEÆ.

133. Androsace septentrionalis Linn. Prairies between Little Missouri and Yellowstone, July 12th.

134. Lysimachia ciliata Linn. Little Missouri, at mouth of Davis Creek, July 10th.

OROBANCHACEÆ.

135. Aphyllon fasciculatum T. & G. Prairies near Heart River, June 24th. Rather common.

136. Phelipæa Ludoviciana Don. Valley of the Yellowstone, July 22d. Common in sandy bottom-lands.

SCROPHULARIACEÆ.

137. Penstemon grandiflorus Nutt. Common on the prairies, between the Missouri and Yellowstone.

138. Penstemon albidus Nutt. Fort Rice, June 13th. Common.

139. Penstemon gracilis Nutt. Crossing of the Big Muddy, June 30th.

140. Penstemon cæruleus Nutt. Near Fort Rice, June 20th.

141. Penstemon cristatus Nutt. Head of Heart River, July 8th.

142. Castilleja sessiliflora Pursh. Bad Boute Creek, July 28th.

143. Orthocarpus luteus Nutt. Bad Route Creek, July 28th.

VERBENACEÆ.

144. Verbena bracteosa Michx. Generally abundant in the prairie dog towns, especially along the Yellowstone.

LABIATÆ.

145. Lycopus sinuatus Linn. Bad Route Creek, July 28th.

146. Hedeoma Drummondi Benth. Little Missouri, at the mouth of Davis Creek, July 10th.

147. Hedeoma hispida Pursh. Little Missouri, at the mouth of Davis Creek, July 10th.

148. Monarda fistulosa Linn. Little Missouri, at the mouth of Davis Creek, July 10th, and the Musselshell Valley, August 21st. This and the above-named species of *Hedeoma* are common at favorable localities, from the Missouri to the Musselshell.

BORAGINACEÆ.

149. Echinospermum Redowski Lehm. Fort Rice, June 15th.

150. Eritrichium glomeratum D. C. Near the Great Bend of Heart River (June 26th), and near the head of Davis Creek (July 9th).

151. Lithospermum canescens Lehm. Fort Rice, June 20th.

152. Lithospermum longiflorum Spreng. Fort Rice, June 13th.

POLEMONIACEÆ.

153. Phlox Douglassi Hooker. Prairies west of Fort Rice, June 22d. Very abundant, in places nearly covering the ground.

154. Collomia linearis Nutt. Crossing of the Big Muddy, June 30th. Common.

CONVOLVULACEÆ.

155. Calystegia sepium R. Br. Valley of the Yellowstone, near the mouth of the Big Horn, August 12th.

SOLANACEÆ.

156. Physalis pubescens Linn. Heart River Crossing (June 26th) and the Yellowstone, opposite Shell Point (July 25th). Seen at only two or three localities, in sandy places, near streams.

157. Solanum triflorum Nutt. Valley of the Yellowstone, at numerous localities. Very much eaten by the *Doryphora 10-lineata* Say, with which it was almost always infested.

158. Solanum rostratum Dunal. Crossing of the Big Muddy, June 30th.

APOCYNACEÆ.

159. Apocynum androsæmifolium Linn. Fort Rice, June 15th.

160. Apocynum cannabinum Linn. Crossing of the Big Muddy, July 1st.

ASCLEPIADACEÆ.

161. Acerates viridiflora Ell. Near the Great Bend of Heart River, June 23d. Common on the prairies.

162. Acerates lanuginosa Descainse. Near the Great Bend of Heart River, June 23d.

NYCTAGINACEÆ.

163. Oxybaphus angustifolius Torr. Heart River, June 26th.

164. Oxybaphus nyctagineus Sweet. Heart River, June 26th.

165. Abronia cycloptera Gray. Near Shell Point, Yellowstone River, July 19th.

166. Abronia fragrans Nutt. Near Shell Point, Yellowstone River, July 19th.

CHENOPODIACEÆ.

167. Obione argentea Moq. Abundant in the bad lands of the Yellowstone and Musselshell.

168. Obione canescens Moq. Fort Rice (June 15th), and thence increasing in abundance westward to the Musselshell.

169. Obione confertifolia Torr. Yellowstone, above Tongue River, August 6th.

170. Endolepis Suckleyi Torr. Yellowstone Valley, and westward. Common.

171. Monolepis Nuttalliana Moq. Fort Rice, June 13th.

172. Suœda diffusa S. Wat. Valley of Yellowstone. Common.

173. Eurotia lanata Moq. Crossing of the Big Muddy, June 30th.

POLYGONACEÆ.

174. Rumex salicifolius Weinm. Crossing of the Big Muddy, June 28th. Frequent along the smaller streams.

175. Polygonum amphibium Linn. Head of Davis Creek, July 9th. Streams, common.

176. Polygonum aviculare Linn. Valley of the Yellowstone, near the mouth of Big Horn River, August 11th.

177. Polygonum ramosissimum Michx. Bad lands of the Yellowstone, August 11th.

178. Eriogonum annuum Nutt. Shell Point, Yellowstone River, July 21st.

179. Eriogonum cernuum Nutt. Shell Point, Yellowstone River, July 21st.

180. Eriogonum brevicaule Nutt. Valley of the Yellowstone, near the mouth of the Big Horn, August 12th.

181. Eriogonum flavum Nutt. Prairies, forty miles west of Fort Rice, June 22d.

182. Eriogonum multiceps Nees. Andrew's Creek, July 10th; head of Davis Creek, July 12th.

ELÆAGNACEÆ.

183. Shepherdia argentea Nutt. Abundant along the Missouri at Fort Rice, and common on Heart River and on the Yellowstone. Very abundant in the valley of the Musselshell, and loaded with fruit — the only place where it was seen with fruit.

SANTALACEÆ.

184. Comandra pallida D. C. Near the Great Bend of Heart River, June 24th. Met with but a few times.

EUPHORBIACEÆ.

185. Euphorbia dyctiosperma Fisch. & Moq. Near crossing of the Little Missouri, July 11th.

186. Euphorbia marginata Pursh. Abundant in the valley of the Yellowstone at the mouth of Custer's Creek, and thence up the Yellowstone to Pompey's Pillar. Confined mainly to the bottom-land of the Yellowstone, and not seen below Custer's Creek.

187. Euphorbia montana Engl. Near the crossing of the Little Missouri, July 11th.

188. Euphorbia polygonifolia Linn. Shell Point, Yellowstone River, July 19th.

189. Euphorbia serpens H. B. K. Shell Point, Yellowstone River, July 19th.

URTICACEÆ.

190. Ulmus fulva Michx. Common along Heart River, and other small streams between the Missouri and the Yellowstone.

191. Humulus Lupulus Linn. Occasional along the wooded parts of all the streams.

CUPULIFERÆ.

192. [? **Quercus macrocarpa** Michx.] A species of Quercus, probably *Q. macrocarpa*, occurs abundantly at a few localities on Heart River, thickly clothing the dry ravines, or coulées, that extend back from the river, where they form sometimes almost the only tree occurring at these localities. It was not noticed west of the Little Missouri.

SALICACEÆ.

193. Salix nigra Marsh. Common along the streams.

194. Salix longifolia Muhl. Common along the streams.

195. Populus monolifera Ait. Abundant along all the streams, at some localities constituting the only timber met with. Along the Yellowstone, above Tongue River, and also on the Mussel-

shell, it forms quite thick forests, occupying a considerable portion of the bottom-lands of these streams.

CONIFERÆ.

196. [? **Pinus Engelmanni** Torr.] Occurs abundantly along the Yellowstone bluffs, above the Great Porcupine Creek, and along the bluffs of the Musselshell. It also occupies much of the broken country between the Yellowstone and Musselshell, above the Porcupine Creeks, the country as far as the eye can see seeming quite well-wooded; generally of small size and quite thinly scattered.

197. Juniperus Sabina var. **procumbens** Pursh. Great Bend of Heart River, June 24th. Common on the tops of the buttes east of the Yellowstone.

LILIACEÆ.

198. Lilium Philadelphicum Linn. Great Bend of Heart River, June 24th.

199. Smilacina stellata Desf. Fort Rice, June 15th.

200. Polygonatum giganteum Dietrich. Fort Rice, June 15th.

201. Calochortus Nuttalli T. & G. Grassy hillsides, near the Crossing of the Little Missouri, July 11th. Not common, and seen at only a few localities.

202. Allium reticulatum Nutt. Fort Rice, June 13th. Very abundant throughout the prairies east of the Little Missouri; perhaps with other species.

203. Zygadenus glaucus Nutt. Near Fort Rice, June 20th.

204. Yucca angustifolia Nutt. Common, especially between the Missouri and Little Missouri Rivers.

IRIDACEÆ.

205. Sisyrinchium Burmudiana Linn. Common in the moist prairies east of the Yellowstone.

COMMELYNACEÆ.

206. Tradescantia Virginica L. Common in the moist prairies east of the Little Missouri.

SMILACEÆ.

207. Smilax herbacea Linn. Fort Rice, June 15th.

207*a*. Smilax herbacea Linn., var. **pulvurulenta** Michx. Near the Great Bend of Heart River, June 24th.

CYPERACEÆ.

208. Scirpus validus Vahl. Crossing of the Big Muddy, June 30th.

209. Carex longirostris Torr. Fort Rice, June 15th.

GRAMINACEÆ.

210. Calamagrostis longifolius Hook. Valley of the Musselshell, August 21st.

211. Stipa viridula Trin. Near Great Bend of Heart River, June 23d.

212. Stipa spartea Trin. Near Great Bend of Heart River, June 23d.

213. Spartina cyanosuroides Wild. Valley of the Yellowstone, near the mouth of the Big Horn, August 12th.

214. Bouteloua curtipendula Gray. Bad Route Creek, July 28th.

215. Bouteloua oligostachya Torr. Bad Route Creek, July 28th.

216. Kœleria cristata Pers.

217. Poa seratina Ehrhart. Fort Rice, June 15th.

218. Poa tenuifolia Nutt. Fort Rice, June 15th.

219. Triticum repens Linn. Valley of the Musselshell, August 21st.

220. Hordeum jubatum Linn.

221. Elymus condensatus Presl. Valley of the Musselshell, August 21st.

EQUISETACEÆ.

222. Equisetum arvense Linn. Fort Rice, June 15th.

FILICES.

223. Woodsia Oregona D. C. Eaton. Near crossing of the Little Missouri, July 11th. Very rare; met with but a few times.

MUSCI.

224. Hypnum filicinum Linn. Near Shell Point, Yellowstone River.

VII. Report on the Butterflies collected by Mr. J. A. Allen on the Yellowstone Expedition of 1873. By Samuel H. Scudder.

The twenty-eight butterflies mentioned below were brought home by the Yellowstone Expedition, sent out under the charge of Gen. D. S. Stanley, by the Secretary of War. They were collected by Mr. J. A. Allen, zoologist and botanist of the expedition, and were taken at four different localities, from Heart River (about 1800 feet above the sea) to the mouth of Cedar Creek on the Yellowstone (about 2200 feet above the sea), between June 26 and July 20. The localities were the following: —

1. Heart River Crossing, Dakotah Terr., about fifty miles west of the Missouri River, June 26. The collections were almost wholly made in the valley of the river, near or among timber. More than half of the specimens brought home, and nearly three-fourths of the species were taken at this place. The butterflies *not* found here were: —*Min. silvestris*, *Arg. nevadensis*, *Char. Ismeria*, *Chrys. Sirius*, *Chrys. Helloides*, *Amar. Zolicaon*, the two species of Erynnis and *Atryt. Logan*. There was a large proportion of Nymphales and Urbicolæ, three-fourths of the butterflies belonging to these two families.

2. "Camp No. 8," at the crossing of Big Muddy Creek, about twenty miles northwest of the Heart River Crossing. There was very little timber here, and most, if not all, of the butterflies were taken in the open country, and represent, says Mr. Allen, the usual species of the prairie. The butterflies taken there were: — *Cœn. Galactina*, *Arg. nevadensis*, *Lyc. Anna*, *Chrys. Helloides*, *Hesp. tessellata* and *Ocytes Uncas*.

3. Near the head of Heart River, about one hundred miles west of the two previous localities, July 8. The butterflies were also taken on the prairie, and consisted of *Bas. Dissippe*, *Van. cardui*, *Arg. nevadensis*, and *Chrys. Helloides*.

4. Shell Point, Yellowstone River, at the mouth of Cedar Creek, ten miles above the mouth of Glendive Creek, — landmarks which will doubtless be given on the next good map of this region. The

butterflies were obtained July 18 and 20, among the sage brush of the river valley, and consisted of *Min. silvestris*, *Bas. Weidemeyeri*, *Char. Ismeria*, *Lyc. Anna*, *Col. Philodice*, *Amar. Zolicaon*, the two species of Erynnis, and *Atryt. Logan*.

NYMPHALES.

1. Satyrus Ridingsii Edw. A single male, rubbed, but not torn, was taken in the river valley, at Heart River Crossing, June 26.

2. Minois silvestris (Edw.). Sixteen specimens (11♂, 5♀) were taken on the banks of the Yellowstone River, in the sage brush, July 18 and 20. About half the males were in fair condition; the other half were rather rubbed and frayed; most of the females were pretty fresh, but two of them were a good deal torn. Probably the butterfly appears early in July.

3. Cœnonympha Galactina (Boisd.) Morr. This species was taken at Heart River Crossing, in the river valley, June 26, and on the open prairie, at the crossing of the Big Muddy, June 28. The males (six) were fresh or very nearly fresh; and the females (fourteen) were all fresh, though some were a little torn, perhaps in capture. The butterfly probably appears toward the end of the month.

4. Basilarchia Disippe (God.) Scudd. This butterfly was only taken on Heart River; a male, fresh and very dark, like Floridan specimens, was taken at the crossing in the river valley, June 26; and a female, very badly rubbed, and of the ordinary color of northern specimens, near the head of the river, on the prairie, July 8.

5. Basilarchia Weidemeyeri (Edw.) Grote. Three specimens of this beautiful insect were taken; two males, one of them perfect, the other pretty fresh, were found near timber at Heart River Crossing, in the river valley, June 26; the third, a female and ragged, was taken in the sage brush of the river valley, near the encampments on the Yellowstone, July 18. Its periods resemble, therefore, those of *B. Arthemis*.

6. Vanessa cardui (Linn.) Ochs. Two males were taken, one fresh, the other very badly frayed; the former on the banks of the Yellowstone, July 18; the latter at Heart River Crossing, June 26; the latter had probably hibernated, and the former was an early individual of the first brood.

7. Argynnis nevadensis Edw. Two males and a female of this butterfly, fresh, were taken on the open prairie at the crossing of

the Big Muddy, June 28. On July 8, at the head of Heart River, also on the prairie, thirteen males were taken, most of them in a tolerably fresh condition.

8. Argynnis Edwardsii Reak. Four males of this species, either fresh or very nearly fresh, were taken June 26, at Heart River Crossing, near the timber in the valley of the river. The seasons of these two species are therefore nearly identical.

9. Phyciodes Tharos (Drury) Kirb. About thirty specimens of this butterfly were taken at Heart River Crossing, June 26, the two sexes in nearly equal numbers; fresh, passable and badly bruised individuals were divided about equally among males and females.

10. Charidryas Ismeria (Boisd.-LeC.) Scudd. Only taken on the Yellowstone, among the sage brush in the valley, July 18; six males and two females were captured; a single male in pretty good condition, the others, as well as the females, dull, rubbed and frayed. Probably, therefore, it appears in June.

RURALES.

11. Lycæides Anna (Edw.). This butterfly was found in considerable abundance, and in nearly all the localities in which collections were made, viz.: at Heart River Crossing, the banks of the Yellowstone, and at the crossing of the Big Muddy, from June 26 to July 18. At the earliest date, twenty-one males were taken, of which six were fresh and bright, twelve tolerably fresh, and three badly rubbed; while of the six females taken at the same time, four were perfectly, and two tolerably, fresh. Two days later, one fresh and one rubbed male and two rather fresh females were taken; while the single female captured July 18 was badly rubbed and torn. The butterfly probably made its appearance this year at or shortly after the middle of June.

12. Agriades Minnehaha nov. sp. Upper surface of male dark violet; the outer margin dark brown, extending more broadly on the front than on the hind wings; upper surface of male rather dark brown, the basal half dusted, not very conspicuously, with blue scales; both sexes have a small black bar crossing the cell of all the wings, larger in the female than in the male; outer margin edged with black, followed interiorly on the hind wings by a line of white scales, upon which are seated small, blackish, interspaceal spots, sur-

mounted, in the female, by small, dull orange, triangular spots. Under surface ashy gray, slightly darker in the male than in the female, the outer border edged with black. Fore wings with a rather large, black discal bar, edged narrowly with white, and midway between this and the outer border a row of small black spots, the upper ones round, the lower oval, all narrowly encircled with white, and arranged in a curve which bends most strongly in the interspaces beyond the cell; there are also two faint rows of transverse, dusky submarginal spots, the inner midway between the border and the outermost portion of the row of black spots. On the hind wings the discal spot is scarcely, if at all, darker than the ground, and distinguishable only by being narrowly encircled with whitish; in the middle of the cell is a small blackish spot, and above it another, both encircled with whitish; beyond is a sinuate series of spots encircled with white, the upper and lower spots black or blackish, the others seldom darker than the ground, and thus indistinct; there is one in each interspace, transverse oval in shape, those in the interspaces beyond the cell lying half way between the discal spot and the border. There is a marginal series of small, round, dark brown spots, often dotted, especially away from the centre, with metallic spots, surrounded with yellowish brown, which above, and especially in the female, deepens into dull orange; these spots are again surmounted by very slight, dark brown lunules, bearing pretty large triangular spots of grayish white, pointing toward, and almost reaching, the extra-mesial row of spots. Expanse ♂ 26 mm.; ♀ 24–26 mm.

This butterfly does not seem to have been described, but it accords best with the description of *Lyc. Maricopa* Reak., from California.

One pretty fresh male, another rubbed male, one fresh and one rubbed, dull female were taken at Heart River Crossing, June 26.

13. Chrysophanus Helloides (Boisd.) Edw. One pretty fresh female was taken at the crossing of the Big Muddy, on the open prairie, June 28.

14. Chrysophanus Sirius Edw. A single male, badly torn and rubbed, was taken on the Yellowstone River, among the sage brush in the valley, July 20.

PAPILIONIDES.

15. Colias Philodice God. At Heart River Crossing, near timber in the river bottom, June 26, ten males were taken, mostly in good condition, though two of them were poor. Later, July 18 and

20, a large number of males and a single female were taken on the banks of the Yellowstone River, among the sage brush; of these, most of the specimens taken on the 18th were pretty fresh; but some males were somewhat or considerably rubbed; of those taken on the 20th, only one specimen was fair, the others being very badly rubbed; some of these were very small, one measuring but thirty-seven millimetres in alar expanse.

16. Colias Eurytheme Boisd. This species was taken only at Heart River Crossing, near timber in the river bottom, June 26. Three pretty good males and two good females were captured, besides three females, rather badly worn.

17. Synchloe Protodice (Boisd.-LeC.) Scudd. Two females only were taken, both fresh; one at Heart River Crossing, June 26; the other on the Yellowstone, July 18.

18. Amaryssus Polyxenes (Fabr.) Scudd. A single female, badly torn and worn, was taken at Heart River Crossing, June 26.

19. Amaryssus Zolicaon (Boisd.). A single male, fresh in color, but a little torn, was taken on the Yellowstone, July 18.

URBICOLÆ.

20. Epargyreus Tityrus (Fabr.) Scudd. A single female, torn (perhaps in capture) but pretty fresh, was taken at Heart River Crossing, June 26.

21. Thorybes Pylades Scudd. A single fresh male was taken at Heart River Crossing, June 26.

22. Erynnis Persius Scudd. A single, rather rubbed male, apparently belonging to this species, though differing somewhat from eastern examples in the abdominal appendages, was taken on the Yellowstone, July 18.

23. Erynnis Lucilius (Lintn.) Scudd. A single male, not very fresh, was taken with the preceding species. It does not differ from the eastern type, even in the abdominal appendages.

24. Hesperia tessellata Scudd. Three fresh males were taken at Heart River Crossing, June 26; but three worn specimens, a male and two females, their fringes all gone, were taken at the crossing of the Big Muddy, only two days later.

25. Oarisma Hylax (Edw.). Three pretty fresh males were taken at Heart River Crossing, June 26.

26. A single male butterfly was taken at Heart River Crossing, June 26, which resembles very closely *Amblyscirtes vialis* in the form and neuration of the wings, in the structure of the legs and antennæ, and even in the coloration and markings of the wings, so far as these could be made out from a somewhat rubbed individual; but there is a perfectly distinct indication of a discal dash of raised scales, the sexual mark of the fore wings in so many Astyci, which is altogether wanting in Amblyscirtes. I await the reception of further material before describing this interesting form.

27. Ocytes Uncas (Edw.). One pair, both fresh, were taken at Heart River Crossing, near timber in the valley of the river, June 26. At the crossing of the Big Muddy, on the open prairie, two females, one of them fresh, the other somewhat less so, were taken June 28.

28. Atrytone Logan (Edw.) Scudd. A torn and rubbed male and a pretty fresh female were taken on the banks of the Yellowstone, among sage brush on the river bottom, July 18.