

## THE ENTOMOLOGY OF THE MID-ALPINE ZONE OF CUSTER COUNTY, COLORADO.

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The present paper is based upon collections made during a residence of about three years (1887-1890) in the district to which it relates. Although the number of insects already recorded from Colorado is very great, the information available, from which a student of geographical distribution can arrive at satisfactory conclusions, is comparatively scanty. The reason of this unfortunate state of affairs is, that the great majority of recorded species are cited merely as from Colorado, without the locality or altitude being given; and as within the limits of the State there are two or three distinct faunæ, the result on compiling the statistics is something like a jumble of the faunæ of Alaska, Minnesota and Texas. Owing to this meeting of different faunæ in Colorado, the State as a whole is extraordinarily rich in species.

The insect fauna of the mid-alpine zone of Custer County presents some elements which are sufficiently diverse; but taken as a whole, it is a natural fauna, belonging to a well-defined region, and hence available for comparison with other like faunæ. It is, indeed, truly characteristic of the mid-alpine, that besides its ordinary elements, it contains species coming up from the sub-alpine, and down from the high alpine; but although it thus happens that *Junonia cœnia* and *Parnassius smintheus* have been taken in the same zone, it does not follow that either are truly characteristic of it, or that they belong to the same fauna. All faunal lists contain such exceptions or deviations from the average; but when, as in the case of Colorado as a whole, there is no uniformity about the range of the various species, and the majority do not occur throughout the territory, it is impossible to treat the region as containing a single fauna.

The insects herein enumerated are only a portion of those taken, but they are enough to draw conclusions from. Almost the whole of my collections have been distributed, and very many of the more obscure species are at the British Museum unidentified. The Coleoptera are mainly in Dr. J. Hamilton's collection, and I have been



indebted to him for the identification of most of the species. Some few were sent to Dr. Horn, and others are in the U. S. National Museum. The Rhopalocera were mostly identified by Mr. W. H. Edwards; a good many species were sent to Mr. Elwes, but he did not send me their names. Mr. Nash, of Pueblo, very kindly gave me information about his captures at Rosita and elsewhere, from which I have quoted largely. The Heterocera I found it difficult to get named, and so the list is small. Mr. Hulst was very kind in identifying species, and the late Mr. Hy. Edwards sent me the names of a few. A good many were sent to Mr. Strecker, but I only got the names of two or three. Mr. Beutenmüller has some of the small species, and so has Prof. Fernald. Some were also sent to Lord Walsingham. The Hymenoptera, with some few exceptions, were sent to Mr. Ashmead, who was most kind in identifying them. Mr. Ashmead also has most of the Hemiptera. Prof. L. Bruner has the Orthoptera, which he kindly identified. I could not find any one to name the Neuroptera, although I sent some species to Mr. McLachlan. The Diptera are mostly unnamed, except a few which I worked out myself. The Arachnida went partly to the Rev. O. P. Cambridge, and partly to Dr. Thorell, but I did not learn the names of the species, although Mr. Cambridge kindly identified the genera. Finally, thanks are due to Prof. Riley and his colleagues at the U. S. Department of Agriculture for constant assistance and advice, which has been invaluable to me.

#### THE MID-ALPINE ZONE OF CUSTER COUNTY.

The mid-alpine zone, as I have defined it,\* extends from about 6500 feet to 10,000 feet. It is essentially the zone of oak-scrub (*Quercus undulata*) and quaking asp (*Populus tremuloides*). Its most characteristic conifer is *Pinus ponderosa* var. *scopulorum*, but with the high-alpine zone it shares *Picea engelmanni*, with the sub-alpine, *Pinus edulis* and *Juniperus virginianus*. The mid-alpine of Custer County is practically the same district as Wet Mountain Valley. This valley has an altitude of about 8000 feet; it is bordered on the east by the Wet Mountains, and on the west by the Sangre de Cristo Range. The central portion of the valley is open prairie land, but the mountain slopes are wooded. Rosita, on the slope of the Wet Mountains, is 8736 feet above sea-level. The two towns situated on the open plain are Silver Cliff, 7990 feet, and West Cliff,

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\* See "Entomological News," 1892, p. 203.



7864 feet (sometimes given as 7718 feet). Not far off is Ula, 7819 feet, now hardly a village.

The valley is watered mainly by Grape Creek, which rises to the south, near Music Pass, and passing West Cliff, Ula and Dora, goes down a narrow cañon to join the Arkansas close to Cañon City. Short Creek, coming from the vicinity of Gibb's Peak, and Swift Creek, descending from the Lakes of the Clouds, both belong to the Grape Creek basin ; but immediately to the north of these is Willow Creek, which belongs to the Texas Creek basin. Texas Creek, of which Brush Creek is a tributary, does not run into Grape Creek, but flowing northward joins the Arkansas higher up. The Cusack Ranch, 8192 feet, is situated just on the divide between the Grape Creek and Texas Creek basins, and also at the junction of the forest and the open country, so that it is an exceptionally good locality for collecting. The latitude of Wet Mountain Valley is about 38° N.

#### CLIMATE.

The climate is dry ; not too hot in the Summer, cold in the Winter. The earliest flowers—*Anemone patens* var. *nuttalliana*—appear at the end of March or beginning of April. Humming-birds arrive at the end of May, and the night-hawks at the beginning of June (for further details, see the 9th and 12th Reports of the Colorado Biological Association).

#### PLANTS CHARACTERISTIC OF THE REGION.

The following plants may be noted as characteristic of the mid-alpine zone of Custer County, Colorado: *Clematis douglasii*, Hook.; *Anemone cylindrica*, Gray ; *A. patens* var. *nuttalliana*, Gray ; *Ranunculus cymbalaria*, Pursh ; *Caltha leptosepala*, DC. ; *Delphinium scopulorum*, Gray ; *Aconitum columbianum*, Nutt. ; *Berberis repens*, Lindl. ; *Argemone platyceras*, L. and O. ; *Viola nuttallii*, Pursh ; *V. canadensis*, L. ; *Silene scouleri*, Hook ; *Sidalcea malvæflora*, Gray ; *S. candida*, Gray ; *Malvastrum coccineum*, Gray ; *Linum perenne*, L. ; *Thermopsis montana*, Nutt. ; *Oxytropis lamberti*, Pursh ; *Rubus strigosus*, Mx. ; *Potentilla fruticosa*, L. ; *Rosa blanda* var. *arkansana* (Porter) ; *Ribes aureum*, Pursh ; *Epilobium angustifolium*, L. ; *Oenothera biennis*, L. ; *Cereus viridiflorus*, Eng. ; *Ligusticum montanum*, B. and H. ; *Cymopterus montanus*, T. and G. ; *Heracleum lanatum*, Mx. ; *Townsendia sericea*, Hook ; *Aster lævis*, L. ; *Antennaria dioica*, Goertn. ; *Achillea millefolium*, L. ; *Senecio aureus*, L. ; *Cnicus ochrocentrus*, Gray ; *Campanula rotundifolia*, L. ; *C. planiflora*, Eng. ;



*Arctostaphylos uva-ursi* (L.); *Gentiana humilis*, Stev.; *G. serrata*, Gunner; *Gilia aggregata*, Spreng.; *Pentstemon acuminatus*, Dougl.; *Mimulus luteus* L.; *Castilleja integra*, Gray; *Euphorbia montana*, Eng.; *Quercus undulata*, Torr.; *Populus tremuloides*, Mx.; *Iris missouriensis*, Nutt.; *Bouteloua oligostachya*, Torr.; *Pinus ponderosa* var. *scopulorum*, Eng.; *Picea engelmanni* (Parry); *P. pungens*, Eng.; *Marchantia polymorpha*, L.; *Bovista circumscissa*, B. and C.; *Hypocrea richardsoni*, B. and M.; *Uredo ribricola*, C. and E.; *Claviceps purpurea*, Tul., and *Valsa nivea*, Fr.

#### CHARACTERISTIC BIRDS.

Under this head the following may be mentioned as examples: *Merula migratoria*, L.; *Sialia arctica*, Swains.; *Chelidon erythrogastra*, Bodd.; *Pica rustica*, var. *hudsonica*, Scop.; *Agelæus phæniceus*, L.; *Scolecophagus cyanocephalus*, Wagl.; *Sturnella neglecta*, Aud.; *Cyanocitta stelleri* var. *macrolopha*, Baird; *Tinnunculus sparverius*, L.; and *Ægialitis vociferus*, L.

#### CHARACTERISTIC MOLLUSCA.

The only slug is *Agriolimax campestris* var. *montanus*, Ing. Of the land shells one may mention *Hyalinia arborea*, Say; *Patula strigosa* var. *cooperi*, W. G. Binn.; *P. striatella*, Anth.; *Vallonia pulchella* var. *cyclophorella*, Ancy; *Pupa coloradensis*, Ckll.; and *Succinea avara*, Say. Of fresh water shells, *Limnæa truncatula*, Müll.; *Physa heterostropha*, Say; *P. hypnorum*, L.; and *Pisidium abditum*, Hald.

#### CHARACTERS OF THE INSECT FAUNA.

The species found in our district are numbered consecutively in the list. To some are appended dates of capture and precise localities; of others I have nothing particular to record, and so the name alone appears. I have also added to many of the species information as to the distribution elsewhere, North or South, up or down, etc., so that the reader can see at a glance the relations of the component parts of the fauna. It may be suggested that the same information could have been conveyed by compiled statistics, but I believe that the method adopted, of giving details regarding each species separately, is much clearer and more useful, although taking up more space. The difficulty with statistics is, that they have to be taken on trust, if the facts on which they are based do not appear in the same paper; this is just what I want to avoid in the present



contribution, I want rather to so present the facts that the reader may compare them and judge for himself, correcting the details or adding to them when necessary.

Among the Coleoptera it will be noticed at once how many of the species are boreal, extending to Canada (*sens. lat.*) and often to the New England States. The Southern element is but slight, although distinct if looked for; and there is also a fair number of species endemic in the Rocky Mountains. The Tenebrionidæ, characteristic of the Western prairies, are fairly numerous. The Coleopterous fauna, as a whole, is strikingly distinct from that of the Mississippi region and the Eastern States generally, except as regards the boreal element. Mr. Wickham has published a list of the beetles found in the vicinity of Iowa City, and on comparing it with the present list, I was astonished to find how few were the species common to both. This result is brought about in large measure, no doubt, by the different character of the forests—those of Iowa containing a great variety of deciduous trees, those of Colorado mainly conifers, with very few deciduous species. Thus, it happens that not one species of Cerambycidæ is common to the Custer County and Iowa City lists, although six species are common to our district and the much more distant State of New Jersey.

The Rhopalocera are boreal with a strong Western element, and a rather surprising number of Southern forms—some of which, however, are evidently represented only by stragglers. Thus, *Calidryas eubule* at Rosita seems quite out of place, but the occurrence is less remarkable when we remember the strong migratory tendencies of the genus. *C. philea* has been taken in Arapahoe County, Colorado, by Mr. H. G. Smith, Jr., as I learned from Mr. Nash. *Terias nicippe*, however, is not accidental, and *Nathalis iole* is very well established and common. The Heterocera show similar tendencies. The really neotropical *Erebus odora* is an occasional visitor.

The Hymenoptera, especially among the parasitic groups, show many apparently endemic forms—but it is probable that further knowledge will prove that most of them are more widely distributed. Thus, *Monodontomerus montivagus*, known only hitherto from Wet Mountain Valley, has recently turned up in California. With the aid of Mr. Cresson's invaluable list, I made out the affinities of the 88 *aculeata* of Wet Mountain Valley to be as follows:

|                              |    |
|------------------------------|----|
| Boreal.....                  | 31 |
| North America generally..... | 4  |
| Rocky Mountains only.....    | 39 |
| Texas region and South.....  | 11 |
| Eastern States.....          | 2  |
| California .....             | 1  |

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Of the Heteroptera, 28 are boreal or widely distributed, 13 Western, and two Southern. *Conorhinus* (species not identified) is a Southern type. For the rest, see the information given in the list. The fauna, as a whole, is decidedly boreal.

#### COMPARISON WITH THE HIGH-ALPINE ZONE.

The high-alpine zone in Custer County extends from 10,000 feet on the Sangre de Cristo range to the summits of the mountains (Gibb's Peak, wrongly called Gibson Peak, 13,729 feet; Horn's Peak, 13,447 feet; Humboldt Peak, 14,041 feet, etc.). A list of the high-alpine species, so far as observed, is given in "Can. Ent." 1890. Although the number of records is not great, they show that the high-alpine and mid-alpine zones are sufficiently distinct.

Of high-alpine Hymenoptera, 49 species were identified, and the result of comparing these with the mid-alpine is as follows: Out of 14 high-alpine families, two (Sapygidæ and Oryssidæ) were not found in the mid-alpine zone. One subfamily, Perilampinæ, is not mid-alpine. Of 42 genera, 16 (rather less than one-third) are not mid-alpine. These are *Oryssus*, *Macrophya*, *Diaeretus*, *Sapyga*, *Perilampus*, *Aspilota*, *Aphidius*, *Sphecodes*, *Dolichopselephus*, *Pteromalus*, *Atractodes*, *Leptacis*, *Psilophrys*, *Calliopsis*, *Tenthredo* and *Microbracon*. Out of 49 species, 25 are not mid-alpine—about one-half.

Of the high-alpine Coleoptera, 25 species are recorded, and a 26th may be added, namely, *Coccinella trifasciata* L., from near the Micawber Mine in October. It extends to Canada, Lapland, etc. Of these 26, seven genera are not mid-alpine, namely, *Orsodachna*, *Dichelonycha*, *Chrysobothris*, *Zeugophora*, *Athous*, *Dasytes* and *Glyptina*. Eleven of the species are wanting in the mid-alpine collections.

Of the Lepidoptera ("Can. Ent." 1890, pp. 57, 76) nine species are not mid-alpine. To these may be added an insect doubtfully referred to *Choreutus silphiella* Grt., from the Micawber Mine: this represents a family not mid-alpine. Lord Walsingham has the specimen.

These statistics would undoubtedly be altered by further research, but I do not think they can be without significance. That the high-alpine and mid-alpine fauna are largely of different derivation seems to be proved by the large proportion of *generic* difference. Thus, 25 distinct species of Hymenoptera include no less than 16 genera; and eleven Coleoptera include eight genera. The high-alpine, therefore, is not, as regards its peculiar features, derived from the mid-



alpine or lower; contrasting in this respect with the high-alpine of Ecuador, which is so derived.

#### THE HIGH-ALPINE COMPARED WITH NORTHERN REGIONS.

The affinities of the high-alpine not being with the mid-alpine, they could only be with the far North. Alberta being a suitable region for comparison, I wrote to Mr. Thomas E. Bean, asking him to tell me how many of my high-alpine species occurred with him. He most kindly replied, giving me the following interesting information:

Of the Coleoptera, he finds at Laggan *Dolopius lateralis*, *Podabrus lateralis*, *Orsodachna atra*, *Cicindela longilabris*, *Adoxus vitis*, *Chrysobothris trinervia*, *Coccinella transversoguttata*, *Trichodes ornatus*, *Acmæops pratensis* and *Mordella scutellaris*. He adds: "That is a good sprinkling, considering that I derive the facts from a small lot I sent Mr. Fletcher several years ago, presumably the commoner species."

Of the Rhopalocera, he has taken the following:

*Lycæna sæpiolus*, Laggan, 5000 ft.

*Pyrameis cardui*, Laggan, 5000 ft.

*Anthocharis ausonides*, Laggan, 5000 ft. Rare.

*Vanessa milbertii*, Laggan, 5000 ft. Also 7000 to 8000 ft.

*Pieris oleracea*, Laggan, 5000 ft. to 6500 ft.

*Papilio rutulus*, on the Columbia near Golden, B. C., altitude about 2550 ft.

*Chionobas chryxus*, Laggan, 5000 to 7000 ft.

*Colias eurytheme*, Laggan, 5000 ft. "Occurrence intermittent, as our altitude is almost above its limit."

*Vanessa antiopa*, Laggan. "Chiefly 5000 ft., but sometimes find larvæ up to about 5500 ft."

*Parnassius smintheus*, Laggan, 5000 ft., and again 7000 to 8000 ft.

*Pieris protodice*, once only at Laggan, 5000 ft.

*Pieris occidentalis*, Laggan, 5000 to 8000 ft.

*Satyrus charon*, Laggan, 5000 ft.

It is to be observed that Mr. Bean does not take our characteristic high-alpine species of *Colias*—*C. scudderii* and *C. meadii*.

The timber line at Laggan is at 7000 ft.

#### MID-ALPINE COMPARED WITH SUB-ALPINE.

For information about the sub-alpine zone of Custer County, and the adjacent parts of Pueblo County, see "Entomologist," December, 1888, pp. 298-305; and 1889, pp. 113 and 190; 1890, p. 19. In making comparisons with the mid-alpine of Custer County, only this district will be considered, as the sub-alpine of localities not imme-



diately adjacent might show other differences than those due to altitude.

Thirty-six Coleoptera were found and identified in the sub-alpine zone, and of these twenty-two, or nearly two-thirds, were not found in the mid-alpine. These include the following eleven genera not found in the mid-alpine: *Pityophagus*, *Batyle*, *Ditylus*, *Badister*, *Serica*, *Diabrotica*, *Tomicus*, *Polyphylla*, *Euryomia*, *Listrus* and *Desmaris*. Of the thirty-six species, one only, *Hippodamia convergens*, was observed to range up to the high-alpine.

Of fourteen Orthoptera from the sub-alpine of Custer County, not a single species was found also in the mid-alpine. Of twelve sub-alpine genera the following eight are not mid-alpine: *Mermiria*, *Hadrotettix*, *Ædipoda*, *Scyllina*, *Acridium*, *Dissoteira*, *Mestobregma* and *Philibostroma*.

Thus, in both Coleoptera and Orthoptera, the difference between the two zones is seen to be very marked, not only as to species, but also as to genera, showing that we have to deal with distinct faunæ.

With the Rhopalocera, so far as my observations went, the differences were by no means so marked. Many species of butterflies undoubtedly fly over a considerable range of altitude, and I was convinced in Wet Mountain Valley that a number of individuals of *Danais plexippus*, *Colias eurytheme*, etc., were to be caught at altitudes a good deal above where they had been bred. But however this may be, several species certainly range right up from the sub-alpine to the high-alpine,—such are *Phyciodes camillus*, *Nathalis iole*, *Limenitis weidemeyerii* and *Colias eurytheme*.

Of course there are also many sub-alpine species which do not range upwards in this manner. Mr. Nash kindly gave me much information about his captures, extending over several years, and the following, among others, were all taken by him in Pueblo County: *Colias cæsonia* Stoll., *Phyciodes picta* Edw., *Grapta interrogationis* Fab., *Satyrus alope* Fab., *Limenitis disippus* Godt., *Paphia troglodyta* Fab., *Thecla melinus* Hüb., *T. siva* Edw., *Lycæna alce* Edw., *Nisoides alpheus* Edw., *Eudamus tityrus* Fab., and *Pamphila cernes* B. and L. The last-mentioned species was taken at Rye.

#### ZOOLOGICAL REGIONS.

Dr. C. H. Merriam has lately (Proc. Biol. Soc. Washington, April, 1892) published a new Bio-geographic map of North America, in which he adopts an arrangement of faunal regions different from



that of Packard (3d Rep. U. S. Ent. Comm.) and most other zoologists. In this new arrangement the old central region is abolished, and a new region, the Sonoran, is made to stretch from the Atlantic to the Pacific.

I have been interested in examining the facts presented in the present paper, and others known to me, to see how far they supported these changes. So far as I am able to judge, the suppression of the central region is entirely justified, but I cannot agree as to the proposed Sonoran region. An analysis of the insects of the Colorado Rocky Mountains shows that the high-alpine and mid-alpine elements, although sufficiently distinct, are both essentially boreal. If we follow Dr. Merriam's arrangement, it appears that the high-alpine is truly boreal, while the mid-alpine belongs to the transition region, containing a considerable number of strictly American types. The sub-alpine, on the other hand, is southern or Sonoran.

Dr. Horn has kindly given me his opinion, as follows:

"My ideas of the distribution of Coleoptera in the mountainous region of Colorado, which is a good centre of the Rocky Mountain chain are as follows:

"The high region seems to have been populated from the Canadian through the H. B. T. region. A collection made above 8000 feet in Colorado is almost identical with one made in the Lake Superior region. The same fauna runs down to N. M. and Arizona, and again appears, mixed, of course, in the Mexican Mountains.

"The sub-alpine region is one that continues from Washington to New Mexico, as shown by such striking forms as *Ergates*, *Melanophila miranda*, *Iphthimus serratus*, *Galeruca externa*, *Calosoma lunatum* in varieties.

"The lower region, foothills, etc., is a mixture of New Mexico forms with those of the eastern United States, with some peculiar forms allied more to the southern regions.

"California is a peculiar region, and, in many respects, allied to Europe (in general). I think California supplies us with more species of genera peculiar to Europe than does the Eastern region." (In litt., July 14, 1892.)

According to the facts now recorded it seems that there is, firstly, a circumpolar and strictly boreal element; secondly, a boreal but modified or Canadian element; and thirdly, a southern element belonging to the arid portion of Dr. Merriam's Sonoran region. I do not think any distinct faunæ except these can be recognized, and the central region accordingly falls. But there is, sprinkled among the ordinary types, a *distinct element of endemic species*, to which I shall refer later. There also seem to be a few surviving fragments of an ancient fauna, of which *Anthracoptyx* is a good example.

There seems to be a small Californian element, but the species



falling under this head are perhaps rather Southern than properly Californian. The Mollusca are very instructive here. There are certain distinct generic types of slugs, *Prophysaon* and *Hemphillia*, which belong to the Californian or Pacific province, and these go inland as far as Idaho. The *Nearctula* group of *Pupa*, which is boreal and Californian, extends southwards into the Colorado Mountains, with three species. The *Vertigo* group, on the other hand, is characteristic of the Eastern States, but I never found it living in Colorado. I did, however, find two species of this group, *P. ovata* Say\* and *P. gouldii* Binn., in a post-tertiary deposit at West Cliff—a fact which I thought might have some significance. From these facts I infer that the fauna of the northern part of the Pacific region is pushing its way inland and southward, and will in the future mingle to some extent with that coming from the southern portion through Arizona.

The resemblance between the Colorado fauna, and that of the Mississippi basin and further East, always, excepting the boreal element that comes from the North, is very slight indeed. The great plains to the east of the Rocky Mountains have been as much a barrier as the sea would have been. Many insect pests of the East are only now reaching Colorado, having been taken there no doubt on plants. Sometime ago, in one of the Fort Collins Bulletins, it was noticed that certain Eastern pests occurred in the grounds of the Agricultural College, but not generally throughout the State. The reason of this was, I suppose, simply that they had been taken there on imported plants.

#### REASONS FOR NOT ADOPTING THE SONORAN REGION.

In Dr. Merriam's map the Upper and Lower Sonoran regions include all of North America, except the boreal and transition areas to the North, and the tropical elements to the South. That is to say, the Pacific province is no longer recognized, and the Eastern and Central provinces, so far as they are not boreal, are merged together. It seems to me that the distribution of the Mollusca, more especially, precludes us from adopting this change. Take the slugs, for instance. Their distribution in the old regions (excluding species known to be imported) is as follows:

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\* Yarrow, in the Wheeler Report, records *P. ovata* from Twin Lakes and Saguache, but as he does not mention any of the *Nearctula* group, which he surely must have found, I suppose it likely that the identification is erroneous.



## PACIFIC PROVINCE.

Agriolimax, 2 spp.

Amalia, 1 sp.

Ariolimax, 2 spp.

Hesperarion, 3 spp.

Prophysaon, 6 spp.

Subg. Phenacarion, 2 spp.

Anadenulus, 1 sp.

Hemphillia, 1 sp.

Binneya, 1 sp.

## CENTRAL PROVINCE.

Agriolimax, 1 sp.

## EASTERN PROVINCE.

Agriolimax, 1 sp.

Philomycus, 5 spp.

Of these, *Agriolimax*, *Ariolimax*, *Binneya* and *Philomycus* range into Central America. Four genera are peculiar to the Pacific province, two of them extending inland as far as Idaho. Not a single genus, except *Agriolimax*, which is cosmopolitan, extends across the continent.

The shell-bearing forms tell exactly the same story. In *Helix*, the group *Lysinoe*, with nineteen species, is confined to the Pacific province. On the other hand, the large and characteristic groups *Mesodon*, *Stenotrema*, *Triodopsis* and *Polygyra* belong to the Eastern province, with a very small representation in the West. Among freshwater forms, the extraordinarily rich fauna of the Eastern province finds no parallel in the West. To pursue this subject further would occupy too much space. I have used the Mollusca in illustration because they are little able to migrate, and present a more forcible instance than I could select in Entomology. But I should be sorry if these incomplete statements prevented any one from considering the matter impartially from other points of view.

## A METHOD FOR DEFINING FAUNAL REGIONS.

It appears from a consideration of what has been written on faunal regions, that it would be desirable if some rules could be laid down, so as to leave the matter less to the discretion of the individual writer. It would require a good deal of research to determine what rules could be laid down, that would work, but as regards insects, at all events, I have thought it possible that the following rule might answer for secondary faunal divisions:

*Any two districts shall be regarded as in the same secondary faunal division if the number of species common to both exceeds the number of genera in common.*

In order to test this rule, I have compared some orders of insects in the mid-alpine of Custer County with the lists in Prof. John B. Smith's New Jersey catalogue. According to accepted views, the



two regions are not in the same secondary division, but from the proximity of New Jersey to the boreal (or at least transition) zone, there should be a fair amount of affinity.

The results are as follows:

| Colo. (mid-alpine, Custer Co.) and N. J. | Genera in Common | Species in Common |
|------------------------------------------|------------------|-------------------|
| Rhopalocera.....                         | 24               | 25                |
| Heterocera.....                          | 59               | 31                |
| Heteroptera.....                         | 36               | 27                |
| Homoptera.....                           | 14               | 4                 |
| Orthoptera.....                          | 12               | 9                 |
|                                          | <hr/> 145        | <hr/> 96          |

The rule here gives just the results that might be expected. The greater number of butterfly *species* in common is in accordance with the wide distribution of *Rhopalocera*, as before mentioned.

It would be interesting to compare the mid-alpine and sub-alpine zones of Colorado in the same manner, but this cannot be satisfactorily done until the sub-alpine records are more complete. When comparing distinct faunæ in close geographical proximity, it would be necessary to exclude from consideration all casual occurrences of species out of their proper zone. The breeding areas are really what should be compared. This is sufficiently obvious; for instance it would be absurd, in such a comparison, to reckon such genera as *Junonia* and *Erebus* as inhabitants of the mid-alpine zone.

#### EQUIGENERIC AREAS.

For minor divisions, to be used in relation to particular groups, I have devised what may be termed equigeneric areas.

*Equigeneric areas are areas throughout which the genera of the group under consideration are identical.*

These areas are sometimes large, sometimes small. When two genera overlap, the region where they both occur, however small, makes a separate equigeneric area. This might be thought a disadvantage; but really, I believe it to be an advantage in the method, since it is important to recognize these intermediate or overlapping areas.

Taking the slugs as convenient for illustration, the equigeneric areas in North America are as follows:

- (1.) Area of *Agriolimax* only = boreal province (so far as slugs have been found) and central region.
- (2.) Area of *Agriolimax* + *Philomycus* = Eastern province (*Veronicella* is found in Florida, and if truly indigenous there, as seems likely, constitutes another area).



- (3.) Area of *Hemphillia* + *Prophysaon* + *Amalia*, etc. = Washington, Oregon and part of Idaho.
- (4.) Area of *Ariolimax* + *Prophysaon* + *Phenacarion*, etc. = Puget Sound district and into Oregon.
- (5.) Area of *Ariolimax* + *Prophysaon* + *Agriolimax* + *Hesperarion* + *Amalia* = Oregon and California, along the coast.
- (6.) Area of *Anadenulus*, etc. = Cuyamaca Mountains, California.
- (7.) Area of *Binneya* = Sta. Barbara Island, California.

These areas cannot in every case be precisely defined, owing to lack of information; but their utility seems to lie chiefly in the fact that they give results quite independent of any previous opinion or bias on the part of the collator.

#### ORIGIN OF THE ROCKY MOUNTAIN FAUNA.

The numerous fossils of Colorado bear testimony to the fact that the region of the Rocky Mountains has in the past been peopled by a highly remarkable and numerous fauna. This fauna, however, does not appear to be ancestral to that of the present day. Nor has the present fauna any special connection with that of the high regions to the far South—the Andes. In order to arrive at just conclusions, it will be needful to consider these points in some further detail.

#### ALPINE INSECTS OF THE ANDES.

The recently-published "Supplementary Appendix" to Mr. Whymper's work on his travels amongst the Andes of Ecuador, containing an account of his captures, includes some very valuable information about the insects of high altitudes in that country. The late Mr. H. W. Bates has written the introduction, in which the following passages occur:

"If there had been any distinct element of a North Temperate or South Temperate Coleopterous Fauna on the Ecuadorian Andes the collections he made, inexhaustive though they may be, would have shown some traces of it; but there are none. A few genera belonging to temperate latitudes, though not found in the tropical lowlands, do indeed occur, but they are forms of almost world-wide distribution in similar climates, and there is no representative of the numerous characteristic and common genera of the North or South. Even the Northern genera, more or less abundantly found on the Mexican highlands, are absent."

"One feature of the fauna is of great interest. It is the occurrence of apterous species of genera which at lower levels are always winged."

"It seems to me a fair deduction from the facts here set forth that no distinct traces of a migration during the lifetime of existing species, from North to South, or *vice versa*, along the Andes, have as yet been discovered, or are now likely to be discovered."



Going through the list of insects taken at high altitudes in Ecuador, the following points may be noted. There are four new species of *Pterostichus* from 12,000 feet and upwards, but they represent a new subgenus. There is not a single *Amara* or *Harpalus*. The two ants from 9000 feet or upwards, are *Camponotus sylvaticus* and a new *Pheidole*. Five Satyrinæ from 10,000 feet or upwards, are none of them of N. American genera. *Pyrameis huntera* was taken at 9800 feet. There are three species of *Lycæna* from over 10,000 feet. Three species of *Colias* are found at 10,000 feet or upwards; one, *C. alticola* Godm. and Salv., being especially characteristic of very high altitudes.

#### FOSSIL INSECTS OF COLORADO.

From the elaborate researches of Mr. Scudder, we have a large mass of facts available concerning the tertiary insects of Colorado. As in the case of the living Andean fauna, we can detect no marked resemblance to the species now inhabiting the Rocky Mountains; and the indications are, that the recent fauna has *not* been derived from that preserved in the beds at Florissant and elsewhere. So far as modern genera are represented, they are certainly not alpine, but indicate a climate more like that of the Southern States.

Mr. Scudder's recent paper (Proc. Bost. Soc. N. Hist. 1892) on the Tertiary Rhynchophora brings out the facts of the case very clearly. The Gosiute fauna, from western Colorado, differs greatly from that of Florissant, no species being common to both; and of ninety-seven genera, only eighteen are common to the two faunæ. Yet these had hitherto been considered as belonging to about the same age.

All the species are extinct, and no species is identical with any European tertiary form. Many of the genera are extinct; existing genera are not infrequently now subtropical or tropical. There are no extinct families, but in one instance an extinct subfamily with numerous representatives.

Almost exactly the same results were obtained previously from a study of the tertiary Hemiptera, though at that time much less material from the Gosiute was available.

#### THE GLACIAL EPOCH.

In order to account for the facts above cited, it is necessary to consider the geological history of America. In Prestwick's "Geology" (1888) there is a good account of what is known about the glacial



period. In America, the whole continent was covered with ice at least as far south as  $40^{\circ}$ , except a rather problematical area between the eastern and central regions. The ice-sheet went further south in the west than in the east, extending about to San Diego, though the basin of the Colorado in Arizona seems to have been free.

However, to the northwest there was apparently an unfrozen coast-line, at least as fertile as that of Greenland at the present day. We read that "the warm currents of the Pacific, which now temper the severity of the coast climate of Alaska, seem to have exerted the same influence during the glacial period, for none of the glaciers which descend from the inland range reach the sea, nor do they appear to have done so in glacial times. . . . The shores of British Columbia, on the contrary, are indented by long and deep fiords, through which, as in Norway and Greenland, the old glaciers, now stayed further in, traveled out to sea."

It can readily be imagined that such a state of affairs would lead to the destruction of a large part of the fauna, the remainder either surviving along the northwest coast-line, or going southward to the Gulf States and Mexico. The eastern fauna, with which we are not now particularly concerned, would largely survive, owing to there being a considerable area of unglaciated territory available. This, indeed, has been the case. The Californian fauna would survive in part to the north, and also in Lower California and the western coast region of Mexico. But the fauna of the central region would be almost annihilated, because the warm winds being cut off by the coast ranges, the country would become extremely cold, even far down into the higher lands of Mexico. The arid region where not actually glaciated would be a frozen desert, and the migration of the fauna southward would be far from easy.

In the eastern province the species of the moist Northern States would find little difficulty in migrating southward into the equally moist Southern States. The isotherms would shift southward over moderately uniform country. In the central region, however, this would not be the case. There is no place available to the South, except the moister coast line, and the interior uplands, which latter were undoubtedly glaciated. The great plains between the Rocky Mountains and the Mississippi would have made an impassable barrier for most species, preventing migration in that direction.

But, it may be urged, at *some* point to the southward the mountains or central uplands would cease to be glaciated, and why should



not migration take place into the neotropical region. That it did *not* take place, at all events beyond the isthmus, is evidenced by the facts above quoted from Mr. Whymper's "Appendix;" and the reason of this no doubt is, that the isthmus itself was submerged, and all connection between North and South America cut off. This question of the submergence of the Isthmus of Panama has been fully discussed by various naturalists, and need not be enlarged upon here.

It is impossible in the present paper to give more than this bare outline of the subject, but I believe the conclusion is justified, that the central region fauna was practically stamped out during the glacial epoch; and that the present fauna is derived from the boreal faunæ which survived to the east and to the west, and the southern fauna which survived in Mexico. This view seems to be supported by a consideration of the present distribution of species, as well as by geological evidence.

#### REMNANTS OF THE ANCIENT FAUNA.

Mr. Scudder's tertiary insects of course date a long way back, and we have no knowledge of the entomology of Colorado immediately before the glacial epoch. But whatever it may have been like, it is reasonable to suppose that there would be some few survivors left, if we only knew which they were. I believe *Anthracopteryx hiemalis* is such a survivor; it is a peculiar species of wide affinities, the only representative of its genus; and moreover, it is not afraid of cold, appearing very early in the year. Among Lepidoptera, it may be that *Neophasia menapia* is a survivor, and also some of the high-alpine species. But this is mere speculation—it is enough to suggest the probability of such a thing.

#### POST-GLACIAL DEVELOPMENTS.

Excepting the remnants of the ancient fauna, all the strictly endemic element in the Rocky Mountains is of *post-glacial origin*—that is, according to the views here set forth. This means a good deal, if it is actually the case, as I believe. Under certain circumstances, species develop quickly, and we have, at least among insects and flowering plants, a great array of new species coming into existence. Such species are closely allied to species from which they sprang, and to each other, so as to give rise to much dispute as to their validity—as an example, one may cite the genus *Argynnis*, which has been very productive of post-glacial species in America.



In such a case it matters little whether we term all these diverse forms true species, or subspecies or races,—but to lump them under a common name obscures the facts, and leads us to ignore one of the most interesting phenomena that are presented to a zoologist.

I was very well pleased to find these opinions shared by so acute an observer as Mr. Thos. E. Bean, of Laggan, Alberta. He wrote me on Dec. 6, 1892: "In answer to your query, I can say most decidedly that in my opinion the butterflies of this [Laggan] district may be arranged in two categories *as to their age as species*: one set of apparently *old old forms*, the others having the appearance of being *forms now taking character*. I have now under consideration one of the latter kind, a *Colias*, which, if completer study confirms my present views, I shall probably announce as a distinct species. In that case I may give it the name *post-glacialis*, in accordance with the idea that it is one of these recently separated species which have not yet acquired complete equilibrium of characters."

#### SPECIES-FORMING AREAS.

It is well known that the genera commonly accepted are unequal in value, but most of those whose validity could not be questioned, are evidently of considerable antiquity. Of the forty-six genera of aculeate Hymenoptera in the mid-alpine of Custer County, thirty-three, or about two-thirds, are also found in the British Is. This is not very different from what might be expected; but the further wide distribution of some of these genera is shown when I open the volume of the "Zoological Record" for 1889, which happens to be at hand, and find references to *Megachile* from the Congo, *Andrena* from Sicily, *Trypoxylon* from Panama, *Ammophila* from Afghanistan, and so forth.

But the curious thing is, that these wide-ranging genera are not equally productive of species over their whole areas. Dr. Simroth has pointed out how in the case of the slug-genus *Agriolimax*, one or two species range almost unchanged over an immense territory; while in the Mediterranean region and the country eastward of it, species are produced in abundance. Dr. A. R. Wallace refers ("Island Life," ed. 2, p. 368) to the existence of four or five peculiar species of the moss-genus *Mnium* in the Drontheim Mountains in central Norway; these are "found nowhere else, although the genus extends over Europe, India, and the southern hemisphere, but always represented by a very few wide-ranging species except in this one mountain group!" Among flowering plants good instances can



easily be found. The British botanist, accustomed to two or three species of *Aster*, two of *Erigeron*, two of *Oxytropis*, and three of *Astragalus*, is astonished at the enormous species-fertility of these four genera in Rocky Mountains; while on the other hand a resident of Colorado, who is used to four species of *Rubus* and three of *Hieracium*, may well be startled to find that in the British Is. the *Rubi* are reckoned at something over sixty, and the *Hieracia*, given as forty in the last "London Catalogue," are still being added to at a quite remarkable rate by Mr. Hanbury!

Among insects, *Argynnis* and *Colias*, and several genera of Noctuæ, exhibit strong species-forming tendencies in the Western States of North America. *Catocala*, in the Eastern States, has a very strong species-forming area. And so on in many other instances which will occur to the reader. This phenomenon is a most remarkable one, since it affects chiefly old and almost cosmopolitan genera, and does not occur in the same districts in all the genera. Two cosmopolitan genera, as we have seen, may have their species-forming areas on opposite sides of the world. It would seem, indeed, as if there were causes at the bottom of it, that we do not yet understand.

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## LIST OF SPECIES.

### COLEOPTERA.

#### CICINDELIDÆ.

1. *Cicindela longilabris* Say. Also high-alpine and Canada.
2. " *sexguttata* var. *patruela* Dej. East to New Jersey (Smith).
3. " *repanda* var. *oregona* Lec. Goes north to Stikine River and Glenora, B. C. (Wickham).

These are boreal forms. The absence of *C. punctulata* var. *micans* Fb., which one finds in the sub-alpine zone, is to be noted. Down at Canon City Mr. Wickham found *C. fulgida* Say, *C. vulgaris* Say, *C. scutellaris* Say, and also one of our mid-alpine species, *C. repanda* Dej., the specimens approaching the var. *oregona*. At Salida he took *C. formosa*. These facts, and others quoted below, are derived from a MS. list very kindly sent me by Mr. Wickham, of his captures at the following places:

Canon City, Colo., 5343 ft., May 11 to 14, 1891 (sub-alpine).

Salida, Colo., 7049 ft., May 15 to 16 (low mid-alpine).

Red Cliff, Colo., 8671 ft., May 16 (typical mid-alpine).

Canon City is only about twenty miles from Wet Mountain Valley. In several instances I have added to the records below the names of other species of the same genera found in the sub-alpine, etc. I place these in square brackets [ ] that there may be no confusion.



## CARABIDÆ.

4. *Trachypachys inermis* Motsch. North to British Columbia.
5. *Carabus maeander* Fisch. North to Canada.
6. " *tædatus* Fabr. Also sub-alpine. North to Canada.
7. " *serratus* Say. Also sub-alpine. North to Canada.
8. *Notiophilus sibiricus* Motsch. Recorded by Packard from Labrador.
9. *Dyschirius truncatus* Lec.
10. *Bembidium nitidum* Kirb. Also at Salida (Wickham).
11. " *bimaculatum* Kirb. North to Canada.
12. " *lucidum* Lec. North to Canada. Down to Salida and Canon City (Wickham).
13. *Bembidium arcuatum* Lec. Extends to Canada (Kilman, "Can. Ent." 1889, p. 109).
14. *Bembidium indistinctum* Dej. [At Canon City, Mr. Wickham found *B. lugubre* and *B. transversale*—but the latter also at Red Cliff.]
15. *Tachys incurvus* Say. East to Iowa (Wickham). Also at Salida (id.) [At Canon City, Mr. Wickham found *T. nebulosus*.]
16. *Pterostichus longulus* Lec. Also at Red Cliff (Wickham).
17. " *luczottii* Dej. West Cliff, April 5. Goes north to Glenora, B. C. (Wickham) and Labrador (Packard).
18. *Amara laticollis* Lec.
19. " *latior* Kirb. North to Canada and East to New Jersey.
20. " *confusa* Lec. Also Rio Grande (Henshaw).
21. " *polita* Lec. East New Mexico (LeConte).\* Salida (Wickham).
22. " *erratica* Sturm.? *A. erratica* occurs in Canada.
23. " *interstitialis* Dej. Also sub-alpine. North to Canada.
24. " *obesa* Say. North to Canada.
25. " *remotestriata* Dej. (= *terrestris* Lec.). North to Glenora, B. C. (Wickham). Down to Canon City, where I found it.
26. " *musculus* Say. North to Canada.
27. " *nupera* Horn.
28. " *chalcea* Dej.?
29. *Platynus affinis* Kirb.? *P. affinis* occurs in Canada.
30. " *sordens* Kirb. N. to Canada. [At Salida Mr. Wickham found *P. placidus* and *P. errans*.]
31. *Lebia vivida* Bates.
32. " *viridis* Say. For a doubtful Canadian record see "Can. Ent." 1890, p. 153. E. to New Jersey (Smith). Down to Pueblo (4669 ft.).
33. *Lebia furcata* Lec., near Ula. I also found specimens which were thought to be *L. scapularis*, but they were probably only *furcata*.
34. *Blechrus nigrinus* Mann. West Cliff, May 25. E. to New Jersey (Smith).
35. *Cymindis planipennis* Lec., on the open prairie, March 30.
36. *Agonoderus pallipes* Fab. N. to Manitoba. Mr. Wickham found it at Albuquerque, N. Mex.
37. *Harpalus retractus* Lec. E. New Mexico (LeConte).
38. " *amputatus* Say. N. to Manitoba. Down to Denver (5196 ft.).
39. " *nitidulus* Chaud.? W. Cliff. *H. nitidulus* occurs in N. J. (Smith).

\* East New Mexico. Species quoted from this locality by LeConte, Smiths. Contr. Knowl., 1859, pp. 52-58.



40. *Harpalus ellipsis* Lec.

41. " *basilaris* Kirb. N. to Canada. [At Canon City Mr. Wickham found *H. oblitus*, *H. lustrans* and *H. basilaris*.]

42. *Stenolophus conjunctus* Say. N. to Canada.

43. *Tachycellus nigrinus* Dej. N. to Canada.

44. " *badiipennis* Hald.

*Carabus maeander*, *Notiophilus sibiricus* and *Amara interstitialis* are boreal and Asiatic, while *Amara erratica* and *Blechnus nigrinus* are boreal and probably circumpolar.

Some species of *Anisodactylus* would probably be found on further search, though so far as I can gather, Colorado is poor in this genus. I found *A. nigrita* Dej. in Cottonwood Gulch, Saguache County; this is high up on the western slope of the Sangre de Cristo Range.

At Red Cliff, which is mid-alpine, though over one hundred miles from Wet Mountain Valley and on the Pacific slope, Mr. Wickham found fifteen Carabidæ, of which the following eleven are wanting in our district: *Calathus ingratus*, *Bembidium planatum*, *B. transversale*, *B. paludosum* var. *lacustre*, *B. mæklini*, *B. fugax*, *B. quadrulum*, *Amara impuncticollis*, *Pterostichus protractus*, *P. hudsonicus*, *P. mutus*.

At Salida, which is lower mid-alpine on the Atlantic slope, Mr. Wickham found thirteen Carabidæ, of which the following eight are wanting in our district: *Calosoma obsoletum*, *Nothopus zabroides*, *Harpalus oblitus*, *H. pennsylvanicus* var. *compar*, *Amara gibba*, *Platynus placidus*, *P. errans*, *Pterostichus orinomum*. These comparisons indicate more difference between the localities than I had quite expected, but perhaps the distinctions would appear less if fuller information were obtained.

#### HALIPLIDÆ.

45. *Haliplus ruficollis* DeG. West Cliff.

The species is boreal, European and Asiatic.

#### DYTISCIDÆ.

46. *Laccophilus decipiens* Lec. West Cliff.

47. *Bidessus affinis* Say. E. to New Jersey (Smith).

48. *Deronectes catascopium* Say.

49. *Agabus intersectus* Cr.

50. " *parallelus* Lec. Northeast to Labrador (Packard).

51. " *morosus* Lec.

52. " *lecontei* Cr.

53. " *obliteratus* Lec. Originally described from Fort Laramie. [At Canon City Mr. Wickham found *A. lugens*.]

54. *Rhantus binotatus* Harr. N. to Canada.

*Deronectes catascopium*, if considered specifically identical with *D. griseo-striatus* DeG., is not only boreal in America, but extends to northern Europe and Siberia.

#### GYRINIDÆ.

55. *Gyrinus* sp., West Cliff, April 16.



## HYDROPHILIDÆ.

56. *Laccobius agilis* Randall. E. to Iowa (Wickham) and New Jersey.  
 57. *Philhydrus diffusus* Lec. West Cliff.  
 58. *Hydrobius subcupreus* Say. West Cliff.

These three species all extend East to New Jersey. Three species found by Mr. Wickham at Canon City are all of genera different from ours, viz., *Limnocharis piceus*, *Cymbiodyta morata* and *Ochthebius interruptus*. It is significant that two of these genera, and all of the species, are absent from the New Jersey list.

## SILPHIDÆ.

59. *Necrophorus marginatus* Fab. N. to Canada.  
 60. " *guttula* Mots. (= *hecate* Bland). E. to New Jersey (Smith).  
 61. *Silpha lapponica* Herbst. Down to Denver (Wheeler Report).  
 62. " *ramosa* Say. Also plains S. of Denver (Wheeler Report). E. New Mexico (LeConte).

*S. lapponica* is boreal in all three northern continents.

## PSELAPHIDÆ.

I did not meet with any. In the sub-alpine, Mr. Wickham found a new *Bryaxis* (*B. wickhamii* Brendel MS.) at Canon City.

## STAPHYLINIDÆ.

63. *Falagria dissecta* Erichs. E. to New Jersey (Smith).  
 64. *Aleochara bimaculata* Grav., Willow Creek, Cusack Ranch. E. to New Jersey (Smith).  
 65. *Heterothrops fumigatus* Lec. West Cliff. E. to New Jersey (Smith).  
 66. *Quedius prostans* Horn.  
 67. *Creophilus villosus* Grav. This species goes North to Alaska (Wickham) and Newfoundland (Gosse), and was found by Gosse in Jamaica!  
 68. *Philonthus æreus* Rossi.  
 69. " *furvus* Nord. Also at Salida (Wickham) and Red Cliff (id.).  
 70. " *puberulus* Horn. West Cliff.  
 71. " *ferreipennis* Horn? West Cliff. [At Canon City Mr. Wickham found *P. virilis*, *P. microphthalmus* and *P. semiruber*.]  
 72. *Xantholinus emmesus* Grav. E. to New Jersey (Smith).  
 73. " *obscurus* Er. E. to New Jersey (Smith).  
 74. *Stenus colon* Say? *S. colon* occurs in Iowa (Wickham). [At Canon City Mr. Wickham found *S. incultus* and *S. dives*.]  
 75. *Pæderus littorarius* Grav., Ula, July 30, and common generally; West Cliff, April 5. N. to Canada. [At Canon City Mr. Wickham found *P. comptens*.]  
 76. *Tachyporus chrysomelinus* L. Also at Red Cliff (Wickham). [*T. jocosus* is sub-alpine.]  
 77. *Platystethus americanus* Erichs. West Cliff. Also high-alpine, and N. to Glenora, B. C. (Wickham).  
 78. *Oxytelus pennsylvanicus* Erichs. West Cliff. N. to Canada.  
 79. " *nitidulus* Grav. Extends to Canada (Kilman) and is no doubt circumpolar.  
 80. *Lomechusa cava* Lec.



81. *Anthobium* sp. incert. Specimens with Dr. Horn and Dr. Hamilton.

82. *Homalota* sp. West Cliff.

*Philonthus æneus*, *Tachyporus chrysomelinus* and *Oxybeles nitidulus* are boreal and extend to Europe and Asia. The wide range of some species of this family is remarkable. The minute *Trogophlæus fulvipennis* Fauv., which I have taken in Jamaica (it also occurs in Cuba, etc.), is, according to Dr. Hamilton, the same as *T. corticinus*, which is found at 9200 ft. in Colorado and extends to Europe and Siberia.

#### CORYLOPHIDÆ.

83. *Sacium lugubre* Lec.

#### PHALACRIDÆ.

None found; at Canon City (sub-alpine) Mr. Wickham found *Olibrus apicalis*.

#### COCCINELLIDÆ.

84. *Næmia episcopalis* Kirby. West Cliff.

85. *Megilla vittigera* Mann.

86. *Hippodamia lecontei* Muls. E. New Mexico (LeConte).

87. " *convergens* Guér., West Cliff, April 5. Also sub-alpine and high-alpine; a wide ranging species. E. to New Jersey.

88. *Hippodamia spuria* Lec. Hesterburg's Lane, Aug. 25.

89. " *sinuata* Muls.

90. " *13-punctata* L.

91. " *parenthesis* Say, Ula, July 30. E. to New Jersey (Smith). Down to Pueblo.

92. *Coccinella trifasciata* L. Ula, July 30 (var.). Also taken near the Micawber Mine in October, in the high-alpine zone.

93. *Coccinella 9-notata* Herbst. Mr. Wickham took this in Alaska. Down to Pueblo (W. H. Hance, Wheeler Report).

94. *Coccinella transversoguttata* Fab. (= *5-notata* Kirby.), West Cliff, May 23. Also high-alpine. Down to Canon City (Wickham).

95. *Coccinella transversoguttata* var. *transversalis* Muls.?

96. *Coccinella sanguinea* L. E. to New Jersey (Smith). This species also goes S. into the W. Indies; I took it at Barbadoes.

97. *Harmonia picta* Rand. Cusack Ranch (M. E. Cusack). North to Canada. Down to Colorado Springs (5992 ft.).

98. *Mysia hornii* Cr.

99. *Anatis rathvoni* Lec. var.

100. *Psyllobora 20-maculata* var. *tædata* Lec. This species goes N. to B. Col.

101. *Hyperaspidius* sp. incert., specimen with Dr. Riley.

102. *Exochomus marginipennis* Lec. E. to New Jersey (Smith).

103. *Hyperaspis fimbriolata* Mels. E. to N. Jersey (Smith). Down to Pueblo.

104. *Scymnus lacustris* Lec.

Some species of this family have a very wide distribution. *Hippodamia parenthesis* may not be specifically distinct from an Asiatic species. *H. 13-punctata*, *Coccinella 3-fasciata* and *C. transversoguttata* appear to be circumpolar.

#### ENDOMYCHIDÆ.

105. *Lycoperdina ferruginea* Lec. E. to New Jersey (Smith).

106. *Aphorista morosa* Lec.



## EROTYLIDÆ.

107. *Tritoma californica* Lec., bet. Smith's Park and Wolff's Cabin, Aug. 25.  
 108. *Erotylus boisduvali* Chev. Denver to Georgetown (Wheeler Report).  
 Santa Fé (LeConte). In our district it is not common; the highest  
 altitude at which it was observed is on Short Creek, at the Cusack  
 Ranch, where one specimen was taken by Mr. R. Cusack.

## CUCUJIDÆ.

109. *Læmophlœus biguttatus* Say. E. to New Jersey (Smith). E. New  
 Mexico (LeConte).

## CRYPTOPHAGIDÆ.

110. *Antherophagus convexulus* Lec.

## DERMESTIDÆ.

111. *Dermestes marmoratus* Say. E. to Iowa (Wickham). Down to Denver.  
 E. New Mexico (LeConte).  
 112. *Dermestes fasciatus* Lec., common. Down to Denver (Wheeler Report).  
 E. New Mexico (LeConte).  
 113. *Dermestes lardarius* var. *signatus* Lec. [At Canon City Mr. Wickham  
 found *D. murinus*.]  
 114. *Perimegatomia cylindricum* Kirby.  
 115. *Attagenus piceus* Oliv. (= *megatoma* Fab.). N. to latitude 54° 53'.  
 116. *Anthrenus scrophulariæ* L. E. to New Jersey.

*D. lardarius* is also European and Asiatic. *A. piceus* is a European insect,  
 and so is *Anth. scrophulariæ*.

## HISTERIDÆ.

117. *Hister subopacus* Lec.  
 118. " *sellatus* Lec., near Ula.  
 119. " *harrisii* Kirb.  
 120. " *depurator* Say, Willow Creek, Cusack Ranch. N. to Canada.  
 121. " *abbreviatus* Fab. (= *bifidus* Say), West Cliff. N. to Canada.  
 122. *Hetærinus morsus* Lec., West Cliff.  
 123. *Saprinus lugens* Er., Willow Creek, Cusack Ranch. Down to Denver  
 (Ulke, in Wheeler Report).  
 124. *Saprinus oregonensis* Lec., Willow Creek, Cusack Ranch. N. to Canada.  
 125. " *fimbriatus* Lec., Willow Creek, Cusack Ranch. [At Canon City  
 Mr. Wickham found *S. ciliatus*.]

Mr. Wickham records fifteen Histeridæ from Iowa City and vicinity, not  
 one of which is common to our region, so far as known.

## NITIDULIDÆ.

126. *Carpophilus pallipennis* Say, Ula, July 30. E. New Mexico (LeConte).  
 127. *Epuræa labilis* Er., on flowers of *Sambucus*. E. to New Jersey (Smith).  
 [*E. papagona* is sub-alpine]  
 128. *Nitidula ziczac* Say. E. to New Jersey (Smith).  
 129. *Meligethes brassicæ* Scop. (= *æneus* Fab.)  
 130. " *mutatus* Har., West Cliff, July 26, by sweeping.



131. *Meligethes seminulum* Lec., near West Cliff.

*M. brassicæ* is also Asiatic and European.

#### TROGOSITIDÆ.

132. *Peltis pippingskoeldi* Mann. Also at Red Cliff (Wickham).  
 133. *Calitys dentata* Fab., Short Creek, Cusack Ranch, Aug. 27. This species is also European.

#### PARNIDÆ.

134. *Dryops striatus* Lec. Also sub-alpine. E. to Iowa (Wickham).

#### DASYLLIDÆ.

135. *Eucinetus terminalis* Lec. E. to New Jersey (Smith).  
 136. *Cyphon variabilis* Thunb., West Cliff, July 27. N. to Canada.

#### BYRRHIDÆ.

None found; but at Red Cliff, which is mid-alpine, Mr. Wickham found *Cytilus trivittatus*.

#### ELATERIDÆ.

137. *Anelastes druryi* Kirby. Also sub-alpine. Mr. Wickham found it at Albuquerque, N. Mex.  
 138. *Megapenthes stigmosus* Lec. Extends northward; found by Mr. Wickham at Port Chester, Alaska.  
 139. *Dolopius lateralis* Esch. Also high-alpine. N. to Canada. Down to Canon City (Wickham).  
 140. *Anthracoptyx hiemalis* Horn, West Cliff, common, crawling on the ground early in the year. Specimens are in U. S. Mus. and Brit. Mus.  
 141. *Cardiophorus* sp. incert. Specimen with Dr. Hamilton.  
 142. *Corymbites conjungens* Lec. [At Canon City Mr. Wickham found *C. maurus*.]  
 143. *Cryptohypnus* sp. nov. vel *hyperboreus*? Near Ula. Specimen with Dr. Hamilton.  
 144. *Asaphes carbonatus* Lec.

*A. hiemalis* is the only species of a remarkable genus, having characters allying it both to the *Cryptohyprites* and *Corymbitites*. Dr. Candéze states that it is allied to *Diadysis*, an Australian genus, and to the Patagonian *Asorno*. Thus, it has such peculiarities as we commonly notice in ancient types, verging on extinction. *Athous ferruginosus* is a boreal species which I found in the high-alpine, but not the mid-alpine region; it goes far North, Mr. Wickham found it in Alaska.

No doubt further search would reveal some more species of *Cryptohypnus* in our region. Mr. Wickham found *C. nocturnus* and *C. abbreviatus* at Red Cliff, which is mid-alpine.

#### BUPRESTIDÆ.

145. *Dicerca prolongata* Lec., Short Creek. N. to Canada.  
 146. *Chalcophora virginensis* Drury, Cusack Ranch. Perhaps of the race *angulicollis*, which, as Dr. Hamilton informs me, is not specifically distinct.



147. *Buprestis nuttalli* Kirby, Willow Creek, Cusack Ranch. N. to Canada.  
 148. " *maculiventris* Say, Cusack Ranch (M. E. Cusack). N. to Can.  
 149. *Melanophila longipes* Say, common.  
 150. *Agrilus torpidus* Lec.

*C. virginensis* is stated by Dr. Hamilton to be hardly or not specifically distinct from *C. mariana* of Europe. *M. longipes* is European and Asiatic—in short, circumpolar.

## LAMPYRIDÆ.

151. *Eros aurora* Hbst.  
 152. *Ellychnia corrusca* L., West Cliff, May 25. N. to Canada.  
 153. *Pyropyga fenestralis* Melsh., Ula, July 30.  
 154. *Pyractomena borealis* Rand., West Cliff, May 26; Cusack Ranch, June 18.  
 155. *Chauliognathus basalis* Lec., Beddoes' Old Ranch, Aug. 9. "Abundant near Fort Bridger and in the Black Hills" (LeConte).  
 156. *Podabrus lateralis* Lec. Also high-alpine. N. to Laggan, Alberta (Bean).  
 157. *Silis munita* Lec.  
 158. " *difficilis* Lec. E. New Mexico (LeConte).  
 159. *Telephorus* sp., West Cliff, July 27.

*Eros aurora* is circumpolar. It is interesting to note that near Iowa City, although Mr. Wickham records species of *Pyropyga*, *Pyractomena*, *Chauliognathus*, *Podabrus* and *Silis*, none of them are the same as ours. A species of *Chauliognathus* is fossil at Florissant.

## MALACHIIDÆ.

160. *Collops vittatus* Say, var. (or n. sp.?), West Cliff, July 26. *C. vittatus* occurs in Canada.  
 161. *Malachius montanus* Lec.  
 162. *Listrus senilis* Lec., West Cliff, July 27; Beddoes' Old Ranch, Aug. 9.

In Mr. Wickham's Iowa City list are three genera of this family; only one, *Collops*, is the same as ours, and then the species is different. Another Iowa City genus, *Attalus*, was found by Mr. Wickham in the sub-alpine at Canon City, the species being *A. basalis*.

## CLERIDÆ.

163. *Trichodes ornatus* Say, very common; June 3, on flowers of *Ligusticum montanum*; July 19, on *Geranium fremontii*; July 20, on *Achillea*; one on a flower of *Rosa blanda*, and many on yellow flowers, June 26.  
 164. *Clerus sphegeus* Fab., West Cliff, May 24 (Mrs. Chetelat). N. to B. Col.  
 165. *Necrobia violacea* L., very common. Specimens of what must have been this, I have formerly called *Corynetes cæruleus*, one having been so named for me.

*N. violacea* is circumpolar. *T. ornatus* goes north to Laggan, Alberta (T. E. Bean in litt.); southward, LeConte quotes it from E. N. Mexico.

*Trichodes ornatus*, as observed by me in our district, is constant in color, with yellow markings and the thorax blue. This is quite the same as *T. hartwegianus* White, the type of which I saw in the British Museum. Spinola's description of *ornatus* agrees with this form, but his figure shows the yellow less developed. *T. douglasianus* White from California, is a distinct form, both as to color and markings; the tho-



rax is green. In the British Museum, under *hartwegianus*, is another form in which the yellow markings are reduced, but tending to resemble those of *douglasianus*; the thorax is blue. This last is from Vancouver Island; the typical *hartwegianus* is from the Rocky Mountains, according to the label on the specimen, not California, as given in Gemminger and Harold's Catalogue, p. 1744. The original *ornatus* of Say is said to have come from Missouri.

## PTINIDÆ.

166. *Ptinus* sp. incert. Specimen sent to Dr. Riley.

## SCARABÆIDÆ.

167. *Canthon praticola* Lec., "Kansas and New Mexico" (LeConte, 1859).  
 168. *Aphodius granarius* L., West Cliff, May 7; April 30.  
 169. " *vittatus* Say, West Cliff. E. to New Jersey (Smith).  
 170. " *brevicollis* Lec.  
 171. " *marginatus* Lec., West Cliff.  
 172. " *cruentatus* Lec.  
 173. " *explanatus* Lec., vide Dr. Hamilton, "Can. Ent." 1891, p. 61.  
 174. " *alternatus* Horn, West Cliff, May 25.  
 175. *Listrochelus* sp. incert., specimen with Dr. Riley.  
 176. *Trox sonoræ* Lec.  
 177. *Diplotaxis brevicollis* Lec.  
 178. " *subangulata* Lec.  
 179. " *pacata* Lec.?  
 180. " *haydenii* Lec., West Cliff, May 23, etc., common at light, pale and dark forms occur. Sub-alpine in Pueblo County.  
 181. *Lachnosterna crinita* Burm. S. to Albuquerque, N. Mex. (Wickham).  
 182. *Cremastochilus knochii* Lec. E. to Iowa (Wickham).  
 183. *Trichius piger* Fab., on *Rosa*, etc. E. to New Jersey (Smith).  
 184. " *texanus* Horn, West Cliff, end of July; Beddoes' Old Ranch, Aug. 9 and Aug. 12.  
 185. *Ligyris lapponicus*.

*Aphodius granarius* is circumpolar; surely native, not introduced, in Colorado. The genus *Diplotaxis* is absent from Mr. Wickham's Iowa City list, but the New Jersey list contains three species. This genus seems in the Rocky Mountains to partly take the place of *Lachnosterna*. At Salida, Mr. Wickham found *Cremastochilus crinitus* and *C. castaneæ*.

## SPONDYLIDÆ.

186. *Spondylis upiformis* Mann.

## CERAMBYCIDÆ.

187. *Ergates spiculatus* Lec. var. *marmoratus* Ckll. See "Ent. News" December, 1890, p. 161. A specimen is in British Museum.  
 188. *Prionus californicus* Mots., one specimen taken, now in British Museum.  
 189. *Homæsthesia emarginatus* Say, Willow Creek, specimen now in B. Mus.  
 190. *Tragosoma depsarium* L., subsp. *harrisii* Lec., Willow Creek, Cusack Ranch, Aug. (M. E. Cusack); also taken in September.  
 191. *Asemum atrum* Esch.



192. *Nothorina aspera* Lec.
193. *Criocephalus agrestis* Kirb. E. to New Jersey (Smith). Plains S. of Denver (Wheeler Report).
194. *Criocephalus montanus* Lec.
195. *Hylotrupes ligneus* Fab., several, now in Dr. Hamilton's coll.; the specimen formerly identified for me as *bajulus*, was probably *ligneus*. E. to New Jersey.
196. *Phymatodes dimidiatus* Kirb., dark var., West Cliff, June 11 (Mrs. Chetelat); and others taken at different times.
197. *Callidium janthinum* Lec.
198. " *cicatricosum* Mann., West Cliff, June 13.
199. *Crossidius discoideus* Say, Texas Creek. Splaun Ranch.
200. *Clytus planifrons* Lec., var. Short Creek, Cusack Ranch, Aug. 27.
201. *Neoclytus muricatus* Kirb.
202. *Atimia confusa* Say, West Cliff, September, specimen now in British Museum. E. to New Jersey (Smith).
203. *Rhagium lineatum* Oliv., Splaun Ranch, April 26, the same day, it snowed. E. to New Jersey (Smith).
204. *Pachyta liturata* Kirb., immaculate var. Cusack Ranch (M. E. Cusack). The species goes N. to Stikine R., B. C. (Wickham).
205. *Acmæops ligata* Lec.
206. " *proteus* Kirb. Also high-alpine, and down to Denver (H. G. Smith, Jr.).
207. *Acmæops pratensis* Laich. Also high-alpine.
208. *Leptura propinqua* Bland, Beddoes' Old Ranch, Aug. 9; also high-alpine.
209. " *subargentata* Kirby. Also high-alpine, and goes N. to Glenora, B. C. (Wickham).
210. *Leptura canadensis* Fab., Cusack Ranch, Aug. 27. The species goes N. to Stikine R., B. C. (Wickham).
211. *Leptura canadensis* var. *cribripennis* Lec., Platte River (LeConte).
212. " *chrysocoma* Kirby, Cusack Ranch, Aug. 3.
213. *Monohammus scutellatus* var. *oregonensis* Lec. The species was found by Mr. Wickham at Stikine R., B. C. (Wickham).
214. *Acanthocinus obliquus* Lec., West Cliff, June 12 (Mrs. Chetelat).
215. " *spectabilis* Lec.
216. *Pogonocherus mixtus* Hald. E. to New Jersey (Smith).
217. " " var. *simplex*.

*Tragosoma depsarium* is doubtless circumpolar, as also is *Acmæops pratensis*, though neither are uniform throughout their range. Although Mr. Wickham quotes 28 genera and 42 species of Cerambycidae from Iowa City and vicinity, only three of the genera (*Prionus*, *Acmæops*, *Leptura*) are common to the mid-alpine of Custer County, Colo., and not one species is common to both! Nevertheless, in Prof. Smith's New Jersey list are 15 genera and six species of Cerambycidae common to our district.

#### CHRYSOMELIDÆ.

218. *Coscinoptera axillaris* Lec.
219. " *vittigera* Lec., frequent; occurs on *Oxytropis lamberti*.
220. *Babia quadriguttata* Say, West Cliff, on *Yucca angustifolia*. E. to New Jersey (Smith).



221. *Pachybrachys hepaticus* Melsh. [At Canon City Mr. Wickham found *P. viduatus*.]  
 222. *Adoxus vitis* Fab., the black form. The species is also high-alpine.  
 223. *Graphops varians* Lec., common.  
 224. *Entomoscelis adonidis* Fab., Hesterburg's Lane, Aug. 25, on leaf of *Cnicus*.  
 225. *Chrysomela flavomarginata* Say, West Cliff, July 27.  
 226. " *montivagans* Lec.  
 227. *Plagiodera oviformis* Lec. N. to Vancouver Island (Wickham).  
 228. *Luperus lecontei* Cr.  
 229. *Trirhabda flavolimbata* Mann.?, abundant, larvæ on *Solidago missouriensis*; larva described as *flavolineatus* in West. Amer. Sci., 1889, p. 10.  
 230. *Trirhabda convergens*\* Lec., near West Cliff, June 26, locally abundant, but not found where the var. *virescens* occurs.  
 231. *Trirhabda convergens* var. *virescens* Ckll., West Cliff, July 27, etc., very abundant; Silver Cliff; see "Ent. News," 1890, p. 4. A specimen is in the British Museum.  
 232. *Adimonia americana* var. *cribrata* Lec., Ula, July 30; West Cliff, May 25, ♂ and ♀ in cop. E. to New Jersey.  
 233. *Galeruca decora* Say, West Cliff. E. to New Jersey (Smith). [At Canon City Mr. Wickham found *G. erosa*.]  
 234. *Monoxia guttulata* Lec. Down to Pueblo (Wheeler Report).  
 235. *Ædionychis lugens* Lec. Originally described from Santa Fé.  
 236. *Disonycha triangularis* Say. Also sub-alpine. Colorado Springs (Wheeler Report).  
 237. *Disonycha quinquevittata* Say, West Cliff, abundant, flying in the sun by willow bushes.  
 238. *Haltica evicta* Lec., West Cliff.  
 239. " *foliacea* Lec. Also sub-alpine. Colorado Springs (Wheeler Rep.).  
 240. " *punctipennis* Lec., Smith's Park, Aug. 8, on *Epilobium angustifolium*.  
 241. *Crepidodera helxines* L., West Cliff.  
 242. *Chætocnema subviridis* Lec., Ula, July 30; West Cliff, July 27. Originally described from Fort Laramie.  
 243. *Psylliodes interstitialis* Lec. (= *convexior* Lec.)  
 244. *Phyllotreta pusilla* Horn, West Cliff, July 31; see also 8th Rep. Colorado Biological Association; also high-alpine.  
 245. *Longitarsus nitidellus* Ckll., Horn, two specimens taken, one now in Dr. Horn's coll., the other in U. S. Nat. Mus.  
 246. *Phædon* sp., see 12th Rep. Colorado Biological Association.

*Ædionychus lugens* is quoted by Horn from New Mexico and Arizona, and *Longitarsus nitidellus* has a like distribution. *Disonycha quinquevittata* appears to occur all over the Western States, and in a few of the Eastern; while, on the contrary, *D. triangularis* is Eastern and

\* On reading Dr. Horn's recent revision of this genus, I have become doubtful whether the species I bred from *Solidago* was not really *T. convergens*; and also whether my *T. convergens* var. *virescens* is not rather a variety of *flavolimbata*. I no longer possess specimens of these insects, and cannot decide about their identification, but my var. *virescens* can be examined in the British Museum.



Canadian. *Haltica evicta* is quoted from Oregon; *H. punctipennis* goes East to Missouri and West to California. *Crepidodera helxines* is widely distributed and also European. *Chæt. subviridis* is found in Kansas, Montana, Arizona and California. *Phyllotreta pusilla* is widely distributed in the West, and a rather serious pest. *Psylliodes convexior* has a very wide distribution, mostly southern. Thus it is seen that our Halticini are derived from various sources, and by no means purely boreal.

*Adoxus vitis* (more properly called *obscurus* L.) is also European and Asiatic; so also is *Entomoscelis adonidis*.

## BRUCHIDÆ.

247. *Bruchus fraterculus* Horn.

## TENEBRIONIDÆ.

248. *Emmenastus acutus* Horn.  
 249. *Embaphion* sp. near *contusura* Lec. Specimen with Dr. Riley.  
 250. *Asida opaca* Say, "Kansas" [= Colorado] and New Mexico, near the mountains (LeConte, 1859). Denver (H. G. Smith, Jr.).  
 251. *Asida sordida* Lec. Also sub-alpine. Denver (H. G. Smith, Jr.).  
 252. " *marginata* Lec.  
 253. *Iphthimus* sp. incert. [At Canon City Mr. Wickham found *I. serratus*.]  
 254. *Coniontis obesa* Lec. Also at Salida (Wickham).  
 255. *Conibius* sp. incert. Specimen with Dr. Riley.  
 256. *Eleodes tricostata* Say, E. New Mexico (LeConte).  
 257. " *obsoleta* Say, West Cliff. Down to Pueblo (Wheeler Report). E. New Mexico (LeConte).  
 258. *Eleodes extricata* Say. Also sub-alpine. E. New Mexico (LeConte).  
 259. " *nigrina* Lec., E. New Mexico (LeConte).  
 260. " *hispidabris* Say. In the Wheeler Report this is recorded from San Luis Valley, Fort Garland and plains S. of Denver.  
 261. *Blapstinus lecontei* Muls.  
 262. " *pratensis* Lec., "Platte River Valley, abundant" (LeConte).  
 263. " *vestitus* Lec., Platte River Valley (LeConte). [At Canon City Mr. Wickham found *B. dilatatus*.]  
 264. *Paratenetus fuscus* Lec. E. to New Jersey (Smith).

Of the above nine genera, the first seven are absent from the New Jersey list; and *P. fuscus* is the only species also recorded therein. Yet the Tenebrionidæ are well represented in New Jersey with thirty-one genera. In the Iowa City list there are eleven genera of Tenebrionidæ, only one of which, *Blapstinus*, is common to our district, and of this the species are different. Thus we see that both as to the forest Coleoptera (*e. g.* Cerambycidæ) and those of open ground (Tenebrionidæ) the fauna of our district is almost totally distinct from that in the vicinity of Iowa City.

*Trimytis pruinosa* was found by Mr. Wickham in the lower mid-alpine at Salida, and also in the sub-alpine at Canon City.



## MELANDRYIDÆ.

265. *Canifa* sp. incert. Specimen with Dr. Riley.  
 266. *Xylita lævigata* Hellw.?  
 267. *Lacconotus pinicolus* Horn.  
*X. lævigata* is also Siberian.

## PYTHIDÆ.

268. *Crymodes discicollis* Lec

## MORDELLIDÆ.

269. *Pentaria* sp. incert. Specimen sent to Dr. Riley.  
 270. *Anaspis atra* Lec.  
 271. *Mordella melæna* Germ. Also high-alpine. E. to New Jersey (Smith).  
 272. *Mordellistena morula* Lec. West Cliff, May 23.  
 273. " *æmula* Lec. West Cliff, May 23. Down to Pueblo (Wheeler Report). Platte River (LeConte).

*Anaspis rufa* Say, was not observed in the mid-alpine of Custer County, but I took it at the Micawber Mine in the high-alpine. It has a typically boreal distribution; in the east Dr. Hamilton informed me that it was common at Allegheny, Pa., and Prof. Smith records it from the Orange Mountains of New Jersey, while in the far north-west Mr. Wickham took it on flowers in Alaska.

## ANTHICIDÆ.

274. *Corphyra lewisii* Horn.  
 275. *Notoxus anchora* Hentz, Ula, by sweeping, July 30. E. to New Jersey. Also in the Iowa City list.  
 276. *Anthicus punctulatus* Lec., frequent by Short Creek.  
 277. " sp. incert., near Ula. Specimen with Dr. Hamilton.  
 278. " *haldemani* Lec.

In the Iowa City list are two species of *Corphyra* and six of *Anthicus*, but all different from ours. At Salida Mr. Wickham found *Anthicus flavicans*.

## MELOIDÆ.

279. *Meloe carbonaceus* Lec., rather common on the open prairie.  
 280. *Tricrania stansburyi* Hald.  
 281. *Nemognatha lutea* Lec., Texas Creek, Old Splaun Ranch, Aug. 12. Also in the Iowa City list.  
 282. *Epicauta ferruginea* Say. Also sub-alpine. Denver (H. G. Smith, Jr.).  
 283. " *pennsylvanica* DeG. Short Creek, Cusack Ranch, August. E. to New Jersey (Smith). Iowa City list (Wickham).  
 284. *Cantharis nuttalli* Say, very abundant. West Cliff, May 25; head of Grape Creek, fourteen miles from West Cliff (C. P. Lowe); Willow Creek, etc.  
 285. *Cantharis viridana* Lec.  
 286. " *sphæricollis* Say. Also in South Park (Wheeler Report).  
 287. " *compressicornis* Horn, on flowers of *Achillea millefolium*, Aug. 23. Down to Denver (H. G. Smith, Jr.).



Of the above five genera, only the first and fourth are common to New Jersey, and of the nine species, only one. New Jersey has only eight species of this family. In the Iowa City list there are four genera and eight species, of which three genera and two species occur with us.

It is rather remarkable that although LeConte's list from E. New Mexico contains thirteen species of Meloidæ, not one of the species is common to our district.

*Epicauta maculata* Say and *Nemognatha immaculata* Say, are two species characteristic of the sub-alpine zone, but not met with in the mid-alpine, according to my experience.

#### RHYNCHITIDÆ.

288. *Rhynchites bicolor* Fab., abundant. West Cliff, June 17, on *Cnicus*. N. to Vancouver Island (Wickham).

#### BYRSOPIDÆ.

Not met with; at Canon City (sub-alpine) Mr. Wickham found *Thecestermus humeralis*.

#### OTIORHYNCHIDÆ.

289. *Ophryastes tuberosus* Lec., common. E. to New Mexico (LeConte).  
290. *Peritaxia rugicollis* Horn.

Neither of these genera are in the Iowa City list. [At Canon City Mr. Wickham found *Ophryastes vittatus*.]

#### CURCULIONIDÆ.

291. *Sitones tibialis* Auctt. This is also European and Asiatic.  
292. *Lepidophorus lineaticollis* Kirby.  
293. *Macrops vitticollis* Kirby.  
294. *Cleonus quadrilineatus* Chev. [At Canon City Mr. Wickham found *C. canescens*.]  
295. *Smicronyx vestitus* Lec. West Cliff, July 31. [*S. fulvus* is sub-alpine.]  
296. *Phyllotrox nubifer* Lec. West Cliff, July 27.  
297. " n. sp., sent to Dr. Hamilton, who says it is common in Colo.  
298. *Magdalis lecontei* Horn. E. to New Jersey (Smith).  
299. *Anthonomus canus* Lec. West Cliff, common.  
300. " n. sp. a very downy little species, sent to Dr. J. Hamilton.  
[A species of *Anthonomus* is fossil at Florissant.]  
301. *Orchestes minutus* Horn.  
302. " *rufipes* Lec.  
303. *Acalles clathratus* Lec.  
304. *Cœliodes curtus* Say. E. to New Jersey (Smith).  
305. *Ceuthorhynchus* n. sp. Specimen with Dr. Hamilton.  
306. *Baris transversa* Say. [At Canon City Mr. Wickham found *B. tumescens*.]  
307. *Calandrinus grandicollis* Lec.  
308. *Apion* sp. West Cliff, July 27, by sweeping.

Of all these species only the first is on the Iowa City list, which nevertheless includes nearly seventy Curculionidæ!



## CALANDRIDÆ.

309. *Cactophagus validus* Lec. See Sixth Rep. Colo. Biol. Assoc.

## SCOLYTIDÆ.

310. *Dendroctonus terebrans* Oliv., quite common. Also sub-alpine in Custer County and in Pueblo County. E. to New Jersey (Smith).  
 311. *Hylastes longus* Lec.

Neither of these genera are on the Iowa list.

## ANTHRIBIDÆ.

312. *Gonotropis gibbosus* Lec.

## NEUROPTERA.

## TERMITIDÆ.

313. *Termes flavipes* Koll., honeycombs *Populus tremuloides*. E. to N. J. (Smith).

## PERLIDÆ.

314. *Leuctra* sp.

## EPHEMERIDÆ.

315. *Callibaetis* sp., near West Cliff.

## ODONATA.

## AGRIONINÆ.

316. *Agrion* (*sens. lat.*) sp., pale ochreous. West Cliff, May 25, locally abundant.  
 317. " " sp., thorax ochre, abdomen reddish and black above, near West Cliff, June 1.  
 318. *Agrion* (*sens. lat.*) sp., like the last, but scarcely any black on abdomen. West Cliff, June 12.  
 319. *Agrion* (*sens. lat.*) sp., thorax blue-black, hairy; abdomen dark reddish and black. West Cliff, by sweeping, June 12. On the underside of the thorax were very many small bright red mites.

## HEMEROBIDÆ.

320. *Hemerobius* sp., near West Cliff  
 321. *Chrysopa* sp., West Cliff, July.

## PHRYGANIDÆ.

Some unidentified species were found.

## ORTHOPTERA.

## MANTIDÆ.

322. *Ameles* (n. sp.?) juv., gray-brown, Old Splaun Ranch, Texas Creek, 1889. Mr. Bruner wrote that it was rather like *A. mexicanus*, but not that.

## LOCUSTIDÆ.

323. *Ceuthophilus maculatus* Harris, in a mine near Rosita (T. Charlton); see "Ent. News," 1890, p. 64. E. to New Jersey (Smith).



## ACRIDIDÆ.

The Acrididæ of the mid-alpine zone are almost entirely different from those of the sub-alpine; compare the present list with that given in "Entomologist," 1888, pp. 300-301.

324. *Chrysochraon abdominale* Thos.?, Willow Creek, Cusack Ranch, Sept.  
 325. *Stenobothrus curtippennis* Harr., West Cliff, July 27; Ula, July 30.  
 Occurs throughout the United States and Brit. Am. (Bruner in litt.).  
 326. *Melanoplus scriptus* Walk. Extends northwestward (Bruner in litt.).  
 327. " *femur-rubrum* DeG. E. to New Jersey (Smith).  
 328. " *gladstonii* Riley. Plains near Rocky Mountains and N. to  
 Saskatchewan (Bruner in litt.).  
 329. *Melanoplus bivittatus* Scudd. E. to New Jersey (Smith). United States  
 and north Mexico (Bruner in litt.).  
 330. *Chortophaga viridifasciata* var. *infusata* Harr. E. to New Jersey.  
 331. " " DeG., type form. E. to New Jersey.  
 332. *Camnula pellucida* Scudd. West Cliff, July 26; near Smith's Park, Aug.  
 25; Smith's Park, Aug. 6; near Smith's Park, Aug. 13. Occurs across  
 the continent (Bruner in litt.).  
 333. *Camnula pellucida* var. *obiona* Thos.; see "Ent. Mo. Mag." Dec., 1888, p.  
 164. Mr. Bruner writes "hardly a variety—merely from high eleva-  
 tions."  
 334. *Arphia teporata* Scudd. Rocky Mts., 5000 to 9000 ft. (Bruner in litt.).  
 335. *Hippiscus leprosus* Sauss.?  
 336. *Trimerotropis vinculata* Scud. Rather widely distributed (Bruner in  
 litt.).  
 337. *Psolœssa coloradensis* Thos. West Cliff, very abundant on dry bench  
 above creek, May 5.  
 338. *Circotettix verruculatus* Kirby, type and var. E. to New Jersey.  
 Rocky Mountains, high, and N. E. to Maine (Bruner in litt.).  
 339. *Spharagemon æquale* Scudd. E. to New Jersey. Rocky Mountains,  
 lower than the last, and northeastward (Bruner in litt.).  
 340. *Tettix acadicus* ? Widely distributed (Bruner in litt.).  
 341. " *granulatus* Kirb. E. to New Jersey.  
 342. " *ornatus* Say. E. to New Jersey.  
 343. *Acrolophus hirtipes* Say. Lower Cox Ranch, Swift Creek, Aug. 25;  
 near Beckwith Ranch, Aug. 9. Plains from Texas to Saskatchewan  
 (Bruner in litt.).  
 344. *Tettigidea* sp.

## HYMENOPTERA.

## APIDÆ.

## APINÆ.

345. *Apis mellifica* L., near Swift Creek.

## BOMBINÆ.

346. *Bombus sylvicola* Kirby, Ula, a nest in stable at Howard Ranch, July 30;  
 and Willow Creek, Cusack Ranch, August.  
 347. *Bombus ternarius* Say. Willow Creek, Cusack Ranch, Aug. 22. Also  
 high-alpine, at timber line; goes S. to New Mexico (Wheeler Report).



348. *Bombus dubius* Cr., near Swift Creek.  
 349. " *nevadensis* Cr., near Swift Creek. Described in the Wheeler Report from Nevada, Arizona and New Mexico.  
 350. *Bombus appositus* Cr., near Swift Creek.  
 351. " *mixtus* Cr., near Swift Creek.  
 352. " *perplexus* var. *hudsonicus* Cr., Cusack Ranch, Aug. 3.  
 353. " *borealis* Kirby, Old Beddoes Ranch, Aug. 9, at flowers of *Rudbeckia laciniata*.  
 354. *Bombus rufocinctus*\* Cr. West Cliff, May 25; Aug. 19, at flowers of *Gymnolomia multiflora*. Also high-alpine.

Of the nine Bombi, *sylvicola*, *ternarius*, *perplexus* and *borealis*, are boreal; *nevadensis* and *appositus* belong to the Western States; *rufocinctus* and *mixtus* are only known from Colorado; and *dubius* is from Kansas and Colorado. The case of *C. rufocinctus* is very remarkable, as it is an abundant and very distinct species, not easily overlooked. It has also a *Volucella*-mimic. Yet Mr. Fox tells me that it is still only known from Colorado.

#### ANTHOPHORINÆ.

355. *Anthophora bomboides* Kirby.  
 356. *Diadasia australis* Cr., near Swift Creek.  
 357. " *enavata* Cr. West Cliff, July 29.  
 358. *Melissodes menuacha* Cr. West Cliff, May 24; has blue-gray eyes.  
 359. *Habropoda* sp. West Cliff, May 23, at *Thermopsis*. A large dark bee with face partly light yellow.  
 360. *Eucera* sp. West Cliff, May 25; dark brown, with partly yellow face.

*Anth. bomboides* is boreal. *Diadasia* Patt. has three species, all found in Colorado. *D. australis* is also in Texas, and *D. enavata* in Kansas and Texas. *Melissodes* has fourteen species in Colorado. *M. menuacha* is widely distributed in the West. *Habropoda* is widely distributed in the United States, with few species; two occur in Colorado. *Eucera*, a genus also found in Europe, seems to have but one described species in the United States.

#### MEGACHILINÆ.

361. *Megachile perbrevis* Cr. Willow Creek.  
 362. " *bucephala* Sm. West Cliff.  
 363. *Anthidium parvum* Cr., near Swift Creek.  
 364. *Monumetha borealis* Cr. West Cliff, May 24; has blue-gray eyes.  
 365. *Osmia densa* Cr. West Cliff, May 25.  
 366. " *integra* Cr. West Cliff, May 19, two specimens.  
 367. " *juxta* Cr.? West Cliff, May 19.  
 368. " *marginipennis* Cr., near Swift Creek, obtained from pupa cells found.

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\* I had failed to notice that this species is recorded from near Ottawa, Canada, by J. A. Guignard (Can. Ent. 1886, p. 68). This record is important from our point of view, as it indicates that the species is of preglacial origin. It should be looked for on the mountains of New England.—T. D. A. C.—Nov. 8.



369. *Cœlioxys coloradensis* Cr., near Swift Creek.

*Megachile* has twenty Colorado spp.; *M. perbrevis* is also in Texas; *M. bucephala* is boreal and western. *Anthidium* has twelve Colorado spp.; *A. parvum* is also in Oregon. *Mon. borealis*, the only U. S. species, is boreal and widely distributed. *Osmia*, with twenty-five spp. in Colorado, presents a good example of the development of numerous species within the limits of an old and widely distributed genus. All of the above mentioned species seem to be, so far as known, confined to Colorado. *Cœlioxys* has nine Colorado spp.; *C. coloradensis* seems confined to Colorado.

## NOMADINÆ.

370. *Bombomelecta thoracica* Cr. West Cliff, May 19.371. *Nomada americana* var. *valida* Cr. West Cliff, May 24, at flowers of *Erigeron radicans*.372. *Nomada parata* Cr. West Cliff, May 19; some have the ends of the antennæ reddish, some have not.373. *Nomada fragilis* Cr. West Cliff, May 19.374. " *morrisoni* Cr. West Cliff, May 19.375. *Panurgus fimbriatus* Cr. West Cliff, May 19, and May 25.376. " *rufocinctus* Ashm. West Cliff. Hym. Colorado\* p. 4.377. " *andrenoides* Cr. West Cliff, May 19, at willow blossom.378. " *marginatus* Cr. West Cliff, May 19.

*Bomb. thoracica*, the only species of its genus, at least in N. America, is western. *Nomada* has twenty-six Colorado spp.; *N. americana* is boreal, but the other three in the list seem confined to Colorado. *Panurgus* and *Nomada* are also European; the Colorado spp. of the latter genus are only seven in number; of the above four, *fimbriatus* and *rufocinctus* seem only known from Colorado; *andrenoides* is also in Texas, and *marginatus* is recorded from Kansas.

## ANDRENIDÆ.

## ANDRENINÆ.

379. *Megacilissa monticola* Ashm. MS.; see 10th Rep. Colo. Biol. Ass'n.380. *Cilissa trizonata* Ashm., Hym. Colo. p. 6.381. " *erythrogaster* Ashm., Hym. Colo. p. 6.382. " *nigrihirta* Ashm., Hym. Colo. p. 6.383. " *albihirta* Ashm., Hym. Colo. p. 5.384. *Nomia nortoni* Cr. West Cliff, on flower of *Yucca angustifolia*. Also high-alpine, at timber line.385. *Andrena* sp. West Cliff, May 24.

*Megacilissa* is quoted in Cresson's catalogue only from Georgia; but Mr. Fox informs me that there are two species in Mexico, and one in N. Mex. *Cilissa* has only one United States species, according to Cresson's work, but probably several exist; the genus is also European. Our four species are only known from Colorado. *Nomia nortoni* extends

\* Hym. Colo. = Ashmead; on the Hymenoptera of Colorado. Bull. 1, Colo. Biol. Assoc., 1890.



to Kansas and Texas; and there is another of the genus in Nevada. *Andrena*, which is also European, has many North American species. Thus, of the above four generic types, two, *Megacilissa* and *Nomia* seem to belong to the Southern fauna; and the other two, to the boreal.

#### HALICTINÆ.

386. *Prosopis varifrons* Cr., Cusack Ranch, Aug. 3, and near West Cliff.  
 387. " *basalis* Sm., Cusack Ranch (M. E. Cusack). Also high-alpine.  
 388. *Colletes* sp. West Cliff, May 19.  
 389. *Agapostemon* sp. West Cliff, May 23, at flowers of *Ranunculus cymbalaria*, and May 25, at *Senecio* flowers, abundant. A bright green species.  
 390. *A. melliventris* Cr.? In September, as I was driving past Dismore's Ranch, just within the Custer County boundary, I saw a bee which seemed very like the figure of this species in the Rept. Wheeler Survey, which, as it happened, I had been looking at a few hours before. Unfortunately, I could not catch it.  
 391. *Halictus* sp. West Cliff, May 23, at *Ranunculus cymbalaria*.

*Prosopis varifrons* seems confined to Colorado, but *P. basalis* ranges to British America. *Colletes* is widely distributed from Canada to Florida, etc., besides being European. *Agapostemon* and *Halictus* go south to Florida, etc., but although there are many United States species of *Halictus*, none, except *trizonatus* from Nevada, seem to have been found on the Pacific slope.

*Sphecodes*, a boreal genus, was not noticed in the mid-alpine; but in the high-alpine region I met with *S. dichroa* Sm. In Europe this genus shows a tendency to become split up into numerous closely allied but distinct species, so that in the British Is. alone there are fifteen specific forms; in North America this species-forming tendency has not shown itself, so far as can be judged from published information, the whole of North America having but five species.

#### CRABRONIDÆ.

392. *Crabro packardii* Cr., near Swift Creek.  
 393. " *vicinus* Cr., near Swift Creek.  
 394. " *bellus* Cr., near Swift Creek.  
 395. " *gracilissimus* Pack., near Swift Creek.  
 396. " *sexmaculata* Say, Willow Creek, Cusack Ranch, Aug. 22.  
 397. *Trypoxylon frigidum* Sm., Cusack Ranch.  
 398. *Oxybelus* n. sp. Ashm., near Swift Creek.

*Crabro sexmaculata* is boreal, but the others are only known from Colorado. *T. frigidum* is also a boreal type. The genus *Oxybelus* is widely distributed in America, and has five Colorado species.

#### PEMPHREDONIDÆ.

399. *Passalæcus mandibularis* Cr., Cusack Ranch (M. E. Cusack); and near West Cliff. Also high-alpine.  
 400. *Passalæcus cuspidatus* Sm. West Cliff.  
 401. *Cemonus inornatus* Say, Cusack Ranch.  
 402. *Stigmus fraternus* Say. West Cliff, by sweeping, July 25.  
 403. *Pemphredon concolor* Say. West Cliff.



This is not a species-forming family, but its types are widely spread. There are only two North American genera not here represented, both belonging to the Northeastern States, and monotypic. *Passalæcus* (also European) is a boreal genus which has not split into many species; there is only one other in the United States besides the above, both of which extend to British America. *C. inornatus*, the only United States species of its genus, extends to Canada, and is widely distributed. The same applies to *Pemph. concolor*, except that there is a second species in Pennsylvania. *S. fraternus* goes to Canada, New York, Pennsylvania, and there is a different species in Illinois. There is no Colorado species of this family not found in Wet Mountain Valley, so far as known.

#### NYSSONIDÆ.

404. *Hoplisus flavinotatus* Ashm. MS.; see 10th Rep. Colo. Biol. Asso'n.

*Hoplisus* is a widely distributed genus, also European.

The genus *Gorytes* is not in our list, and judging from Cresson's list, the species seem to come from the Southern and Eastern States. But Mr. Fox has lately described five new species from Western States (Nevada, Montana, Washington), showing that it will not do to theorise very much on present information, which is so liable to be upset by new discoveries.

#### BEMBECINÆ.

405. *Steniolia obliqua* Say, Cusack Ranch (M. E. Cusack); West Cliff.

This species is given only for Colorado in Cresson's list, but I learn from Mr. Fox that it is found in British Columbia and Texas, and that there are three other American species.

#### NEOLARRINÆ.

406. *Neolarra pruinosa* Ashm., Hym. Colo., p. 8.

This insect was made the type of a new species, genus and subfamily by Mr. Ashmead, and is, I believe, still only known from the typical specimen, which is in the collection of its describer.

#### LARRIDÆ.

#### LARRINÆ.

407. *Larra montana* Cr., Cusack Ranch (M. E. Cusack).

A widely distributed genus, but the present species seems confined to Colorado. There are four other Colorado species.

#### SPHECIDÆ.

408. *Ammophila vulgaris* Cr. West Cliff, May 25.

409. " *robusta* Cr., Swift Creek, caught preying upon a *Clisiocampa* larva.

410. *Ammophila macra* Cr., Willow Creek, Cusack Ranch, Aug. 14.

411. " *luctuosa* Sm. West Cliff, May 23, 24 and 25.

*Ammophila*, also a European genus, is well represented in Colorado with nineteen species. *A. vulgaris* is also found in Texas, and so is probably a southern type; while *A. luctuosa* is boreal, and the other two seem peculiar to Colorado.



## POMPILIDÆ.

412. *Agenia congrua* Cr., near Swift Creek.  
 413. *Pompilus biguttatus* St. Farg.  
 414. " *scelestus* Cr., near Swift Creek.  
 415. *Priocnemis* sp., near Swift Creek.

All three genera are also European. *Pompilus* is extremely rich in species, and widely distributed; eleven species occur in Colorado, both of those given above are boreal. *Priocnemis* has six Colorado species. *Agenia congrua*, the only Colorado species of its genus, is down in Cresson's catalogue only for W. Va., but possibly it will prove to be really boreal.

## VESPIDÆ.

416. *Vespa germanica* Fb., near Swift Creek.  
 417. " *maculata* Fb., Willow Creek, Cusack Ranch, August. Extends to Labrador (Packard).  
 418. *Vespa occidentalis* Cr., near Swift Creek.  
 419. " *diabolica* Sauss., Cusack Ranch, Aug. 3.  
 420. " *infernalis* Cr., near Swift Creek.  
 421. *Polybia* sp. incert. Specimen with Dr. Riley.

The wasps are very similar to those of Europe, and *V. germanica* is specifically identical. *V. maculata*, *diabolica* and *infernalis* may be considered boreal, while *V. occidentalis* is western. For this last species Cresson cites Nevada and New Mexico, while Mr. Fox informs me that he has seen specimens from Washington and Vancouver Island. *Polistes* occurs immediately below the mid-alpine region, and I believe extends into it, but I have no records.

## EUMENIDÆ.

422. *Eumenes fraternus* Say, near Swift Creek.  
 423. *Odynerus walshianus* Sauss., near Swift Creek.  
 424. " *debilis* Sauss., near Swift Creek.  
 425. " *sulfureus* Sauss., near Swift Creek.  
 426. " *capra* Sauss., near Swift Creek.  
 427. " *tigris* Sauss., near Swift Creek.  
 428. " *albophaleratus* Sauss., near Swift Creek.

Both the genera are also European, and all the species are boreal, except *O. walshianus*, known elsewhere only in Illinois; and *O. sulfureus*, which also occurs in California. Thinking that *O. walshianus* must surely have been found in some intermediate locality during recent years, I questioned Mr. Fox, and he assures me that this is not the case.

## MUTILLIDÆ.

429. *Photopsis alcanor* Blake, near Swift Creek.  
 430. " *glabrella* Cr., near Swift Creek, etc., common. Also sub-alpine.  
 431. " *atrata* Blake, Willow Creek, Aug. 27, and near West Cliff.  
 432. *Sphærophthalma mollissima* Blake, Ula, July 30.  
 433. " *creusa* Cr., West Cliff, July 27.  
 434. " *fulvohirta* Cr., near Swift Creek.



*Photopsis* and *Sphærophthalma* are genera inhabiting the dry regions of the West, and extremely rich in species, which are closely allied to one another. *Eleodes*, among the Coleoptera, offers a similar instance. It is difficult to account for the origin of so many species under conditions which can hardly at any time have been very diverse. Mr. Fox writes me "no species of *Photopsis* is known further east than Colorado. *P. cressoni* Fox, from New Jersey, is a doubtful *Photopsis*. *Sphærophthalma* is found in all regions except the extreme North and South, and is especially well represented in the Tropics; it is not distinct from *Mutilla*." Three of the above species seem confined to Colorado, but of the other three, *P. alcanor* extends to Arizona, *P. atrata* to Nevada, and *S. creusa* to Texas.

## FORMICIDÆ.

- 435. *Camponotus sylvaticus* var. *vicinus* Mayr.\* Also high-alpine.
- 436. *Formica fusca* L., common; Dora, March 27.
- 437. " *integra* Nyl., very abundant; West Cliff, March 29; Beddoes' Old Ranch, May; April 5; Dora, March 27. Also high-alpine.
- 438. *Formica aterrima* Cr., West Cliff, common by the water-works May 25.
- 439. " *ciliata* Mayr?, West Cliff, at flowers of *Yucca angustifolia*.
- 440. *Lasius flavus* DeG., West Cliff.
- 441. " sp.
- 442. " *niger* var. *alienus* Först., West Cliff.
- 443. *Tapinoma sessile* Say, near Swift Creek. Also high-alpine.

*Formica aterrima* and *F. ciliata* seem confined to Colorado, but for the rest the species are boreal, and three of them quite identical with European forms. *F. aterrima* is a conspicuous species, but Mr. Fox tells me that it is still apparently confined to Colorado. *F. integra* is very near the European *F. rufa*, but Mr. Fox says authorities are agreed in considering it distinct.

## MYRMICIDÆ.

- 444. *Pogonomyrmex occidentalis* Cr., West Cliff, July 27.
- 445. *Myrmica scabrinodis* var. *lobicornis* Nyl., Willow Creek, Aug. 27. Also West Cliff.
- 446. *Monomorium* sp.

The *Pogonomyrmex* is also found in Texas. *M. lobicornis* is also European.

## CHRYSIDIDÆ.

## CHRYSIDINÆ.

- 447. *Chrysis clara* Cr., N. to Wash. and S. to Arizona and Texas.
- 448. " *pacifica* Say, near Swift Creek, common. N. E. to Labrador.
- 449. " *lateridentata* Aaron, near Swift Creek. N. to Washington.
- 450. " *cærulans* Fab., near West Cliff. E. to New Jersey (Smith) and N. to Vancouver.

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\* *C. sylvaticus* Oliv. was found by Mr. Whymper at 9000 feet in Ecuador. Mr. Cameron remarks that it "is very generally distributed over the old world, as well as in America."



## ELAMPINÆ.

451. *Hedychrum violaceum* Brull., small var. Willow Creek, Cusack Ranch. N. to Canada.  
 452. *Hedychridium viride* Cr. E. to New Jersey region.  
 453. *Notozus viridicyaneus* Nort., near West Cliff. N. to Canada.

## PROCTOTRUPIDÆ.\*

## BETHYLINÆ.

454. *Bethylus pedatus* Say. E. to Indiana.

## PLATYGASTERINÆ.

455. *Polygnotus error* Fitch, West Cliff, bred from gall of *Cecidomyia salicis-brassicoides*. E. to New York.

## BELYTINÆ.

456. *Ismarus atropetiolatus* Ashm., West Cliff, July 31. Hym. Colo. p. 11.  
 457. *Psilomma coloradensis* Ashm., Hym. Colo. p. 11.  
 458. *Miota glabra* Ashm., Hym. Colo. p. 12.  
 459. *Anectata polita* Ashm. MS.; see 3d Rep. Colo. Biol. Asso'n.  
 460. *Xenotoma macrodyctium* Ashm. MS.; see 3d Rep. Colo. Biol. Asso'n.  
 461. *Zelotypa coloradensis* Ashm., Hym. Colo. p. 12.

## CYNIPIDÆ.

## FIGITINÆ.

462. *Figites coloradensis* Ashm., West Cliff, June 11, by sweeping. Also high-alpine. Hym. Colo. p. 13.

## INQUILINÆ.

463. *Periclistus pirata* O. S., West Cliff, bred from galls of *Rhodites ignota*. E. to Connecticut.  
 464. *Periclistus fusi* Ckll., bred from galls of *Rhodites fusiformans*, West Cliff. Tr. Ent. Soc. Lond. 1890, xvi-xvii (sine descr.)

## CYNIPINÆ.

465. *Diastrophus fusiformans* Ckll., Ashm., near Swift Creek. Hy. Col. p. 13.  
 466. *Rhodites rosæfolii* Ckll., Ashm., West Cliff, common; see "Ent. Mo. Mag." 1889, July, p. 324; August, p. 363; "Entom." 1890, p. 74; "Psyche" 1889, p. 284. Specimens in U. S. Nat. Mus. and Brit. Mus. Manitou and near Fort Collins (Gillette).  
 467. *Rhodites bicolor* Harr., West Cliff, abundant. N. to Canada. Down to Manitou and near Fort Collins (Gillette).  
 468. *Rhodites fusiformans* Ckll., Ashm., West Cliff, abundant; see "Entom." March, 1890, p. 75; "Can. Ent." March, 1890, p. 56. Hym. Col. p. 14.

\* I have just received (November 24th) Mr. Ashmead's monograph of N. A. Proctotrypidæ, wherein the species from Wet Mountain Valley are named as follows: 1, *Synopeas inermis* Ashm.; 2, *Miota glabra* Ashm.; 3, *Miota* (olim *Psilomma*) *coloradensis* Ashm.; 4, *Belyta monilicornis* Ashm.; 5, *Cinetus* (olim *Xenotoma*) *macrodyctium* Ashm.; 6, *Pantoclis* (olim *Zelotypa*) *coloradensis* Ashm.; 7, *Anectata polita* Ashm.; 8, *Spilomicrus* (olim *Ismarus*) *atropetiolatus* Ashm. The *Cinetus* is also known from Virginia, all the rest are known only from our district.



469. *Rhodites tuberculator* Riley, MS., Ckll., Swift Creek, abundant; see "West. Amer. Sci." April, 1888, p. 60.
470. *Rhodites ignota* O. S., West Cliff, abundant. E. to New Jersey region. Down to near Fort Collins (Gillette).
471. *Rhodites polita* Ashm., West Cliff, gall only observed. Also recorded from California and Dakota (Ashmead). Hym. Colo. p. 14.
472. *Rhodites spinosellus* Ckll., West Cliff, gall only observed; see "Entom." March, 1890, p. 75; "Can. Ent." 1890, p. 39. Also high-alpine.
473. *Rhodites globosus* Ckll., West Cliff, gall only observed; see "Entom." March, 1890, p. 75.
- For further information about the distribution of *Rhodites* in Colorado, see Gillette "Ent. News," 1892, p. 246.
474. *Holcaspis globulus* Fitch. Galls on *Quercus undulata*, supposed to be this. The species *H. globulus* occurs in New York and Connecticut.
475. *Dryophanta*? sp., small pubescent galls on midrib of underside of leaf of *Quercus undulata*.

## URO CERIDÆ.

476. *Urocerus flavicornis* Fab., Ula (E. L. B. Howard). Also high-alpine and sub-alpine. Packard records it from Labrador.
477. *Urocerus areolatus* Cr., Willow Creek, Cusack Ranch, Aug. 14. S. to N. M.

## TENTHREDINIDÆ.

## XYELINÆ.

478. *Xyela minor* Nort., West Cliff, May. N. to Canada.

## TENTHREDININÆ.

479. *Labidia opimus* Cr., near West Cliff. N. to Vancouver Island.
480. *Monostegia obscurata* Cr., West Cliff, May 25, on herbage by the creek, abundant; Colorado only (Cresson, 1887).\*
481. *Monophadnus scelestus* Cr., West Cliff, May 19, by sweeping *Thermopsis*; and Aldrich Ranch, on *Smilacina stellata*, June 1. W. to Nevada.
482. *Dineura pallida* Ashm., Hym. Colo. p. 15.
483. *Dolerus similis* Nort., West Cliff, May 23 and 24; Aldrich Ranch, on low herbs, June 1. N. to Canada.
484. *Dolerus bicolor* Beauv., West Cliff, May 25. N. to Canada.
485. " *abdominalis* Nort., near Swift Creek. N. to Canada.
486. " *aprilis* Nort., West Cliff, May 19 and May 22; Aldrich Ranch, on low herbs, June 1. N. to Canada.
487. *Messa salicis* Ashm. (= *salicum* Ckll.), Freer Ranch, bred from larvæ on willow; see "Psyche" 1889, p. 284. Hym. Colo. p. 15.
488. *Nematus concolor* Nort., West Cliff; see "Entom." 1890, p. 282. N. to Canada.
489. *Nematus lateralis* Nort., near Swift Creek. E. to Maine.
490. *Euura salicis-ovum* Walsh, West Cliff, galls common, but fly not reared. Throughout Mississippi Valley and east; following distribution of *Salix cordata*, to N. H. (Marlatt in Howard litt.).

\* (Cresson, 1887.) This citation, here and elsewhere in the paper, refers to Mr. E. T. Cresson's Catalogue of the Described Hymenoptera of America north of Mexico.



491. *Phymatocera* sp.. West Cliff, May 19, by sweeping *Thermopsis*; a black species.

In the case of the *Messa*, it is difficult to say which name should be used. Only the larva was described as *salicum*, and when I published the notes in "Psyche" I supposed Mr. Ashmead would use the same name for the imago. A fuller description of the larva than that formerly given is appended.\*

#### CIMBICINÆ.

492. *Cimbex americana* Leach, Short Creek, Cusack Ranch, larvæ; see "Can. Ent." 1890, p. 76. N. to Canada.

#### BRACONIDÆ.

##### BRACONINÆ.

493. *Vipio coloradensis* Ashm., two specimens taken, one now in U. S. Nat. Mus. and one in Brit. Mus.

##### HECABOLINÆ.

494. *Cænophanes atrata* Ashm., Cusack Ranch, Aug. 2. Hym. Colo. p. 16.  
495. *Lysitermus coloradensis* Ashm. Also high-alpine.

##### DORYCTINÆ.

496. *Doryctes* sp.. West Cliff.

##### HORMIINÆ.

497. *Hormius americanus* Ashm., Hym. Colo. p. 16.

##### RHOGADINÆ.

498. *Rhogas lectus* Cr., near Swift Creek. E. to Illinois; see also "Insect Life" 1890, p. 351.  
499. *Rhogas intermedius* Cr., near Swift Creek. N. to Canada.

##### SIGALPHINÆ.

500. *Schizoprymnus fissilis* Prov. (sub *Chelonus*), Cusack Ranch. Query recte *fissus*, a Canadian species.

##### CHELONINÆ.

501. *Chelonus aculeatus* Ashm., near West Cliff. Hym. Colo. p. 17.  
502. " *lævifrons* Cr., Colo. only (Cresson, 1887).  
503. " *sericeus* Say, Willow Creek, Aug. 27. N. to Canada.

##### MICROGASTERINÆ.

504. *Apanteles læviceps* Ashm., Hym. Colo. p. 17.  
505. " sp., cocoons found on *Oxytropis lamberti*.

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\* *Messa salicum*. Larva: about 20 mm. long; head shiny, black with a dull olive face; body light bluish green, dorsal vessel appearing as a darker green line. Laterally, on each body-segment, except the first and last, is a chrome-yellow patch; above each patch are three black spots (on some segments four). and below each patch four black spots, the upper anterior one being the largest. Anal plate blackish. Legs pale green, a blackish spot between most of the abdominal pairs. On willow, Freer's Ranch, June 12, 1888.



506. *Apanteles* sp., cocoon-cluster on *Potentilla fruticosa* Brock Ranch, Willow Creek.  
 507. *Apanteles congregatus* Say, near Swift Creek. N. to Canada.  
 508. *Microgaster gelechiæ* Riley. E. to Missouri.  
 509. *Microplitis fuscipennis* Ashm. MS.; see 10th Rep. Colo. Biol. Asso'n.  
 This has not been described, Mr. Howard informs me.  
 510. *Microplitis ceratominæ* Riley. E. to Illinois.

## AGATHIDINÆ.

511. *Agathis vulgaris* Cr. S. to Texas.

## METEORINÆ.

512. *Meteorus nigristigmus* Ashm. MS.  
 513. " *angustipennis* Ashm. MS.\* West Cliff.  
 514. " *robustus* Prov. N. to Canada.  
 515. " *vulgaris* Cr., West Cliff, July 26, by sweeping; Willow Creek, Aug. 27. N. to Canada.  
 516. *Meteorus politus* Prov., Cusack Ranch, Willow Creek, Aug. 2, etc., and near West Cliff. N. to Canada.  
 517. *Meteorus gracilis* Prov., West Cliff, by sweeping, July 25. N. to Canada.

## DIOSPILINÆ.

518. *Promachus* n. sp., Ashm., near Swift Creek.

## MACROCENTRINÆ.

519. *Macrocentrus montivagus* Ashm. MS.; see 10th Rept. Colo. Biol. Asso.  
 520. *Zelee melleus* Cr., bet. West Cliff and Aldrich Ranch, June 1. S. to Tex.

## ALYSIINÆ.

521. *Pentapleura alticola* Ashm., Hym. Colo. p. 18; see also 3d Rep. Colo. Biol. Asso.  
 522. *Homophyla atrocoxalis* Ashm., Cusack Ranch. Hym. Colo. p. 18.  
 523. *Trachyusa americana* Ashm. Hym. Colo. p. 18.  
 524. *Adelura ampla* Ashm. Hym. Colo. p. 19.  
 525. " *montana* Ashm. Hym. Colo. p. 19.  
 526. *Diaspasta* n. sp., Ashm. West Cliff.  
 527. " *montana* Ashm. MS., near Swift Creek.  
 528. " n. sp., Ashm.  
 529. *Idiasta americana* Ashm. MS.

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\* *Meteorus angustipennis*. Mr. Ashmead identified a number of species for me, the names of which are followed by his authority, but of which I can trace no published record. I enter these with some hesitation, crediting them to "Ashm. MS." I have written both to Mr. Ashmead and Mr. Howard to gain information about them. Mr. Howard writes that he cannot tell whether they are published, as Mr. Ashmead has published so many short descriptive papers. Mr. Ashmead does not remember about them, and has not time to look them up. The Hymenoptera will be getting into a rather chaotic state, if authors cannot themselves tell what they have described. It is time for a supplementary catalogue.



## DACNUSINÆ.

530. *Cœlinius nigripes* Ashm. West Cliff, by sweeping, July 25. Hym. Colo. p. 19.

## APHIDIINÆ.

531. *Praon coloradensis* Ashm. Hym. Colo. p. 20.  
 532. " *politus* Ashm. MS.  
 533. *Lysiphlebus salicaphis* Fitch, West Cliff, July 31. Also high-alpine (as *salicaphidis* Ashm.). E. to New York.  
 534. *Lipolexis chenopodiaphidis* Ashm., Smith's Park, Aug. 6. Also high-alpine.  
 535. *Lioplexis atriventris* Ashm. MS., Smith's Park, Aug. 6. Also high-alpine.

## ICHNEUMONIDÆ.

## ICHNEUMONINÆ.

536. *Ichneumon corvinus* Cr., Willow Creek, Cusack Ranch. N. to Canada.  
 537. " *lætus* Brull., bet. Micawber Mine and Smith's Park, Aug. 8. N. to Canada.  
 538. *Ichneumon subfulvus* Cr., Willow Creek, Cusack Ranch, Aug. 21. Colo. only (Cresson, 1887).  
 539. *Ichneumon vultus* Cr., Willow Creek, Cusack Ranch, August. Colo. only (Cresson, 1887).  
 540. *Ichneumon longulus*, Cr., between West Cliff and Aldrich, June 1. N. to Canada.  
 541. *Nematomicrus coloradensis* Ashm., Proc. U. S. N. M., xii, 395.  
 542. *Phæogenes montivagus* Ashm., Proc. U. S. N. M., xii, 394.

## CRYPTINÆ.

543. *Phygadeuon ater* Ashm. Hym. Colo. p. 20.  
 544. " *laticinctus* Ashm. Hym. Colo. p. 21.  
 545. " *montanus* Cr., West Cliff, by sweeping, July 26. Colo. only (Cresson, 1887).  
 546. *Cryptus persimilis* Cr., near Swift Creek. N. to Canada.  
 547. " *americanus* Cr., near Swift Creek. N. to Canada.  
 548. " *luctuosus* Cr., West Cliff, June 6. Colo. only (Cresson, 1887).  
 549. " *pumilus* Cr., West Cliff, May 19. E. to Delaware.  
 550. *Nematopodius orbitalis* Ashm., near Swift Creek. Hym. Colo. p. 21.  
 551. *Ischnocerus montanus* Ashm., Proc. U. S. N. M. xii, 419.  
 552. " *incertus* Ashm. MS.  
 553. *Orthopelma coloradensis* Ashm., Proc. U. S. N. M. xii, 418.  
 554. " *americana* Riley; see "Insect Life" 1890, p. 154.  
 555. *Hemiteles cincticornis* Ashm., reared from *Apanteles læviceps* Ashm., Hym. Colo. p. 21.  
 556. *Hemiteles alticola* Ashm., Hym. Colo. p. 22.  
 557. " *stigmatus* Ashm., West Cliff. Hym. Colo. p. 21.  
 558. *Pezolochus atratus* Ashm., West Cliff. Hym. Colo. p. 22.  
 559. *Catalytus americanus* Ashm. MS.  
 560. *Pezomachus pettitii* Cr., amongst herbage near Grape Creek, West Cliff, October 6. N. to Canada.



## OPHIONINÆ.

561. *Ophion purgatum* Say, near Swift Creek. N. to Canada.  
 562. " *bilineatum* Say, Willow Creek, Cusack Ranch. N. to Canada.  
 563. *Nototrachys reticulatus* Cr., near Swift Creek. Colo. only (Cress., '87).  
 564. *Paniscus geminatus* Say, between West Cliff and Aldrich Ranch, June 1;  
 and Cusack Ranch, Aug. 3. N. to Canada.  
 565. *Casinaria americana* Ashm., Hym. Colo. p. 22.  
 566. *Limneria macer* Cr., West Cliff, May 25, Cusack Ranch, Aug. 2. Colo.  
 only (Cresson, 1887).  
 567. *Limneria montana* Cr., Willow Creek, Cusack Ranch, Aug. 22. Also  
 high-alpine. Colo. only (Cresson, 1887).  
 568. *Limneria valens* Cr., Ula, July 30. Colo. only (Cresson, 1887).  
 569. *Mesochorus agilis* Cr., West Cliff, July 27, by sweeping herbage. Colo.  
 only (Cresson, 1887).  
 570. *Banchus speciosus* Cr., near Swift Creek. Named for me thus, but Mr.  
 Howard suggests that probably *B. spinosus* was intended, as there does  
 not seem to be any *B. speciosus* described by Cresson.

## TRYPHONINÆ.

571. *Orthocentrus trifasciatus* Walsh, near Swift Creek. E. to Illinois.  
 572. *Brassus tibialis* Cr., near Swift Creek. N. to Canada.

## PIMPLINÆ.

573. *Ephialtes perlongus* Cr., near Swift Creek. E. to Massachusetts.  
 574. *Pimpla sexcincta* Ashm., Hym. Colo. p. 24.  
 575. " *texana* Cr. S. to Texas.  
 576. " *pedalis* Cr. (or *tenuicornis* Cr.?). West Cliff, July 27. N. to Canada.  
 577. " *rubromaculata* Ashm. MS., Ula, July 30.  
 578. *Polysphincta burgessii* Cr. N. to Canada.  
 579. *Glypta varipes* Cr., var. with shorter ovipositor, Willow Creek, Cusack  
 Ranch, Aug. 14. Colo. only (Cresson, 1887).  
 580. *Arenetra rufipes* Cr., near Swift Creek. N. to Canada.  
 581. *Phytodietus pleuralis* Cr., Cusack Ranch. Colo. only (Cresson, 1887).  
 582. *Euxorides americanus* Cr., near Swift Creek. N. to Canada.  
 583. *Odontomerus vicinus* Cr. E. to Massachusetts.  
 584. *Echthrus nubilipennis* Cr. Colo. only (Cresson, 1887).  
 585. *Meniscus* sp., West Cliff.  
 586. *Lampronota pleuralis* Cr. N. to Canada.  
 587. " *rufipes* Cr. N. to Canada.  
 588. *Thalessa lunator* Fab., not observed by me, but Mr. E. L. B. Howard de-  
 scribed to me an insect he had seen at Ula, which may have been this.  
 N. to Canada; also in the sub-alpine zone.

## EVANIIDÆ.

589. *Gasteruption occidentale* Cr., near Swift Creek. Colo. only (Cress., '87)

## CHALCIDIDÆ.

Finding that several of the genera found in Custer County did not appear to be known in North America outside of Colorado, I sent a list of such to Mr. L. O. Howard, who has kindly replied as follows:



"The genera mentioned are all widespread, and by no means confined to the mid-alpine fauna. The study of the Chalcididæ is, in fact, so little advanced that we are in no position for generalizations like those which you wish to make. I doubt, in fact, whether one-fiftieth of our species in this family have as yet been described!" (*in litt.* Jan. 12, 1893.)

To this Mr. Howard adds statistics regarding the genera supposed to be only known from Colorado, and as the information embodied in these is new and valuable, I give it under the several subfamilies, although, to use an Irish expression, it only proves that it doesn't prove anything.

#### EUCHARINÆ.

590. *Stibula montana* Ashm., West Cliff, July 27, by sweeping herbage. As yet only known from Custer County, Colorado. There is a species of *Stibula* in Virginia, but the genus is otherwise South American. Hym. Colo. p. 24.

#### EURYTOMINÆ.

591. *Eurytoma bigeloviæ* Ashm., West Cliff, bred from galls of *Trypeta bigeloviæ*. Hym. Colo. p. 25.  
 592. *Eurytoma diastrophæ* Walsh, West Cliff, bred from galls of *Rhodites ignota*, *Rhodites fusiformans* and *R. bicolor*. Also high-alpine. N. to Canada.  
 593. *Eurytoma studiosa* Say, West Cliff, bred from galls of *Cecidomyia* n. sp. near *hordeoides*, Walsh. N. to Canada.  
 594. *Isosoma hordei* Harr., var. West Cliff, July 31; the variety with pale legs, ♂. N. to Canada.

#### TORYMINÆ.

595. *Monodontomerus montivagus* Ashm. Also in California, parasitic on bees (see "Insect Life" 1892, p. 141). Hym. Colo. p. 25.  
 596. *Syntomaspis leucopus* Ashm. MS., West Cliff, July 27, by sweeping herbage.  
 597. *Syntomaspis lazulella* Ashm.  
 598. " *cupeipes* Ashm., West Cliff, July 27, by sweeping herbage.  
 599. " *monticola* Ashm. MS.; see "Ent. News" 1890, p. 79.  
 600. *Torymus chrysochlora* O. S., West Cliff, bred from *Rhodites fusiformans* gall. Also in the N. E. States.  
 601. *Torymus rudbeckiæ* Ashm., West Cliff, bred from an undetermined gall, supposed to be Cynipid. Hym. Colo. p. 26.  
 602. *Torymus magnificus* O. S., West Cliff, bred from *Rhodites bicolor* galls. E. to Connecticut.  
 603. *Torymus cyaneogaster* Ashm. MS., Ula, July 30.  
 604. " sp., bred from galls on willow; see "Entom." 1890, p. 282.  
 605. " n. sp., Ckll., bred from gall of *Cecidomyia alticola*.  
 606. " sp., West Cliff, May 19, by sweeping *Thermopsis*; brilliant blue-green, with a long, straight ovipositor.

#### TRIDYMINÆ.

607. *Tridymus cobaltinus* Ashm. MS., West Cliff, by sweeping herbage, July 27  
 Mr. Howard writes, "we have species of *Tridymus* from Richfield Springs, N. Y., the elevation of which I should estimate at 1000 feet, and from Washington, D. C., where, as you know, we are not over 200 feet above sea-level."



## PTEROMALINÆ.

608. *Rhopalicus coloradensis* Ashm. Hym. Colo. p. 27.  
 609. *Dipara latipennis* Ashm., near West Cliff. Hym. Colo. p. 26.  
 610. *Eutelus* sp., West Cliff, bred from galls of *Cecidomyia s.-brassicoides*; see "Entom." 1890, p. 282.  
 611. *Eutelus flavipes* Walk.?, West Cliff, bred from an undetermined gall on a species of *Compositæ*. Hym. Colo. p. 27. *E. flavipes* was described from England.  
 612. *Habrocytus rosæ* Ashm., West Cliff, July 26, by sweeping, and bred from galls of *Rhodites fusiformans* and *R. ignota*; also captured at Cusack Ranch, Aug. 2, and Smith's Park, Aug. 6.  
 613. *Habrocytus obscuripes* Ashm., West Cliff, bred from *Rhodites bicolor* galls, May; also from galls of *Rhodites ignota*. Hym. Colo. p. 27.  
 614. *Cecidostigma megastigma* Ashm. MS., Smith's Park, Aug. 6. Presumably should be *Cecidostiba*.  
 615. *Glyphe flavipes* Ashm. MS., Hugg Ranch, Aug. 9; bright green with triangular abdomen.  
 616. *Glyphe viridicyaneus* Ashm. MS., Smith's Park, Aug. 6.  
 617. *Stenomalus muscarum* Walk., West Cliff, July 26, by sweeping, ♂. This species, Mr. Howard informs me, was described from England.  
 618. *Amblymerus productus* Ashm., Ula, July 30.  
 619. *Meraporus monticola* Ashm. MS., Cusack Ranch, Aug. 2 and 3; and near West Cliff.  
 620. *Platytermus citripes* Ashm. MS., West Cliff, July 27, by sweeping herbage.

*H. rosæ* has been bred from a gall collected in British Columbia; see "Can. Ent." 1890, p. 56.

Mr. Howard writes: "Of *Rhopalicus* we have one species from eastern Tennessee at a point the elevation of which is about 1500 feet; of *Habrocytus* we have two species from Washington, D. C., one from Los Angeles, Cal. (elevation 500 feet), one from Virginia (elevation about 500 feet); of *Platytermus* we have one species from Albany, N. Y. (elevation 500 feet), one from Alameda, Cal. (elevation about 100 feet), and one from Nevada County, California (elevation about 3000 feet); of *Amblymerus* we have one species from Virginia; of *Stenomalus* we have one from District of Columbia, one from Agricultural College, Michigan (elevation 500 feet), one from Virginia, and one from Alameda, Cal.; of *Cecidostiba* we have one from Pine Canon, California (elevation not known); of *Meraporus* we have one species from the District of Columbia, one from Virginia, one from Athens, Ga. (elevation 500 feet), one from Los Angeles, Cal., one from Agricultural College, Michigan, one from eastern Tennessee (elevation 1500 feet), and one from San Bernardino County, California (probably about 1500 feet to 2000 feet)."

## ENCYRTINÆ.

621. *Homalotylus bifasciatus* Ashm., taken in August. Hym. Colo. p. 28.  
 622. *Encyrtus sulcatus* Ashm. MS., West Cliff, July 27, by sweeping herbage.  
 623. " *subauratus* Ashm. MS., West Cliff, July 27, by sweeping herbage.  
 624. *Encyrtus subopacus* Ashm. MS., West Cliff, July 27, by sweeping herbage.



## TETRASTICHINÆ.

625. *Tetrastichus rosæ* Ashm., West Cliff, bred from galls of *Rhodites bicolor*. S. E. to Florida.  
 626. *Tetrastichus* sp., bred gall of *Cecidomyia s.-batatas*.

## LEPIDOPTERA.

## PAPILIONIDÆ.

## PIERINÆ.

627. *Neophasia menapia* Feld., Beddoes' Old Ranch, Aug. 25; N. to Washington, where it occurs at 1900 feet (Stretch), and Vancouver Island.  
 628. *Pieris sisymbri* Bdv., Cusack Ranch, May 12; see also 6th Rep. Colo. Biol. Asso'n. W. to California and S. to Arizona.  
 629. *Pieris protodice* B. and L., West Cliff, May 25; April 15; June 26, common. N. to Canada.  
 630. *Pieris oleracea* Bdv., near Swift Creek, May 9. N. to Canada.  
 631. " " form *hiemalis* Harr.  
 632. *Nathalis iole* Bdv., near Swift Creek, June 17; two forms, *aureomaculata* and *flavomaculata*; see 4th Rep. Colo. Biol. Asso'n.  
 633. *Anthocharis ausonides* Bdv., Rosita (Nash); near Cusack Ranch, June 19; at rest on *Gilia*, May 24; June 26. N. to Alaska.  
 634. *Callidryas eubule* L., Rosita (Nash). A southern species, with individuals straggling northward; the genus has migratory tendencies.  
 635. *Colias meadii* Edw., Rosita (Nash). Really a high-alpine species. N. to Montana and S. to New Mexico.  
 636. *Colias eurytheme* Bdv. N. to Canada.  
 637. " " var. *autumnalis* Ckll., West Cliff, May 23, at flowers of *Thermopsis*. A specimen in Brit. Mus.  
 638. *Colias eurytheme* var. *eriphyle* Edw.  
 639. " " var. *intermedia* Ckll., West Cliff, May 25; May 19.  
 640. " " var. *keewaydin* Edw.  
 641. " " form *pallida* Ckll., West Cliff, May 19, etc.; see "West Amer. Sci." November, 1887, p. 217.  
 642. *Colias alexandra* Edw., Cusack Ranch, Aug. 3; below Micawber Mine, Aug. 8; Beddoes' Old Ranch, Aug. 15; flying abundantly, June 20; July 9. N. to Canada.  
 643. *Terias nicippe* Cram., June 17, by Swift Creek. A southern species, but E. to Pennsylvania. Down to Pueblo County (Nash).

A third species of *Colias*, *C. scudderii* Reak., was taken in the high-alpine zone, but not lower. *Nathalis iole* is a species of the plains, essentially southern, but going quite high in the Rocky Mountains, even up to the lower portion of the high-alpine zone.

The Pierinæ of our region show clearly a mingling of the boreal and southern faunæ.

## PARNASSIINÆ.\*

644. *Parnassius smintheus* Dbl. and Hew., near Cusack Ranch, June 19; Oak Hollow, June 26. The species goes N. to Canada.†

\* = *Parnassiidae*, Elwes, P. Z. S., 1886, p. 18.

† Canada. Here and elsewhere in the paper, used in the wide sense, as including "British America."



## PAPILIONINÆ.

645. *Papilio rutulus* Bdv. N. to British Columbia.  
 646. " *asterias* Fab. U. S. generally, and in Canada.  
 647. " *zolicaon* Bdv., Rosita (Nash). A Californian type; see "*Papilio*," 1883, p. 54, et seq. N. to Montana, S. to Arizona.  
 648. *Papilio philenor* L., Rosita (Nash). U. S. generally, and Canada. Arizona (W. H. Edw., "*Papilio*" 1882, p. 28).

*P. rutulus* and *asterias* were common, but I never myself saw *zolicaon* or *philenor*. *P. zolicaon* is an alpine insect, having been taken by the late Mr. Foster in the high-alpine at Marshall Pass. *P. philenor*, on the other hand, seems to be sub-alpine or hardly alpine; Mr. Nash took it also at Pueblo. *P. nitulus* has a wide range in altitude, going into the high-alpine; and down to Trinidad (Colo.), where it was found by Mr. Nash, and Denver (H. G. Smith, Jr.).

## NYMPHALIDÆ.

## EUPLEINÆ.

649. *Danaïs plexippus* L., June 18; May 14; April 24 (R. Cusack); July 19, at flowers of *Oxytropis lamberti* and *Trifolium pratense*; July 20, at flowers of *Gilia*.  
 650. *Danaïs berenice* Cram., Rosita (Nash); near Ula, June 26.  
*D. plexippus* goes N. to Canada, and S. into the neotropical region. *D. berenice* extends southward.

## NYMPHALINÆ.

651. *Agraulis vanillæ* L., Rosita (Nash). It was in 1880 that Mr. Nash took this and *C. eubule*, both southern species, at Rosita.  
 652. *Euptoieta claudia* Cram. Also sub-alpine. Properly a southern species, but E. to New York, and has occurred in Canada.  
 653. *Argynnis cipris* Edw. N. to Montana, S. to Arizona.  
 654. " *myrina* Cram., near Taylor Creek, June 9 (Nash). N. to Alaska  
 I took some other *Argynnids*, but they were sent to Mr. Elwes, who did not identify them for me.  
 655. *Melitæa minuta* Edw., near Wolff's Cabin; June 26. S. to Arizona and New Mexico.  
 656. *Melitæa nubigena* Behr., Rosita (Nash). N. to Montana, W. to California. S. to New Mexico.  
 657. *Phyciodes nycteis* Dbl. N. to Canada.  
 658. " *tharos* Drury, Rosita (Nash). N. to Canada.  
 659. " *camillus* Edw. Has a wide range in altitude, high-alpine to sub-alpine. N. to Montana, E. to Kansas.  
 660. *Phyciodes vesta* Edw., Rosita (Nash). S. to Texas. Also taken by Mr. Nash at Pueblo.  
 661. *Grapta zephyrus* Edw., Rosita (Nash). Swift Creek. N. to Montana, S. to Arizona, W. to California.  
 662. *Vanessa antiopa* L., West Cliff, May 19; April 14; April 1; March 29; near Swift Creek, June 17. Also European.  
 663. *Vanessa milbertii* Godt., May 8; April 14; April 13. N. to Canada.  
 664. " " var. *subpallida* Ckll., West Cliff, May 19; see also "*Entom.*" July, 1889, p. 185.



665. *Vanessa californica* Bdv., Rosita (Nash). Also in Oregon, Nev. and Cal.  
 666. *Pyrameis atalanta* L., Beddoes' Old Ranch, Aug. 9; near West Cliff, April 28; Swift Creek, May 13. Also European.  
 667. *Pyrameis huntera* Fab., becoming common on June 27. "North America generally" (W. H. Edwards).  
 668. *Pyrameis cardui* L., West Cliff, May 23; May 19; April 28, very abundant; April 23; at flowers of *Mertensia*, May 16.  
 669. *Pyrameis cardui* form *minor* Ckll., near Conway Ranch, June 26.  
 670. *Junonia cœnia* Hbn., Rosita (Nash). A southern type, but has been taken in Maine and Ontario.  
 671. *Limenitis weidemeyerii* Edw., Beddoes' Old Ranch, June 26. Extends up to timber line, and down to the sub-alpine. N. to Montana, S. to Arizona.

Mr. Nash informed me that he took *Argynnis helena* Edw., *A. electa* Edw., *A. hesperis* Edw. and *A. eurynome* Edw., at Music Pass. This is in Custer County.

#### SATYRINÆ.

672. *Cœnonympha ochracea* Edw., near Taylor Creek, June 9 (Nash); near Oak Hollow, June 26. N. to Canada, S. to Arizona.  
 673. *Hipparchia ridingsii* Reak., abundant. June 26. N. to Montana.  
 674. *Satyrus charon* Edw., Rosita (Nash); I also met with the species. N. to Canada.  
 675. *Chionobas chryxus* Westw. and Hew., Rosita (Nash). Goes up to timber line, where it is chiefly found. N. to Canada.  
 676. *Chionobas uhleri* Reak., Rosita (Nash); near Swift Creek. N. to Mont.  
*Erebia epipsodea* Butl. was taken by Mr. Nash at Music Pass.

#### LYCÆNIDÆ.

##### LEMONIINÆ.

677. *Lemonias cythera* Edw., Rosita (Nash). Mr. Nash also found it at Music Pass. S. to Arizona. Another species of the genus, *L. nais* Edw., occurs in Colorado, and was found by Mr. Nash in Hardscrabble Canon.

##### LYCÆNINÆ.

678. *Thecla augustus* Kirby, Willow Creek. N. to Canada.  
 679. " *behrii* Edw., Rosita (Nash). W. to California.  
 680. " *eryphon* Bdv., Rosita (Nash). W. to California.  
 681. " *dumetorum* Bdv., Rosita (Nash). Also in Oregon and Nevada.  
 682. *Chrysophanus thoe* B. and L., Rosita (Nash); West Cliff, July 26. N. to Canada.  
 683. *Chrysophanus helloides* Bdv. Also high-alpine, frequent. N. to Montana, W. to California. Rosita and Music Pass (Nash).  
 684. *Chrysophanus sirius* Edw., Rosita (Nash). N. to Canada, S. to Arizona.  
 685. *Lycæna lycea* Edw., Rosita (Nash); near Swift Creek. N. to Montana, S. to Arizona.  
 686. *Lycæna sæpiolus* Bdv., Rosita (Nash); I took it both in the mid-alpine and high-alpine zones. N. to Canada.  
 687. *Lycæna oro* Scudd., West Cliff, May 23. Also high-alpine; also in New Mexico and California.



688. *Lycæna rustica* Edw., Rosita (Nash). I took it in Saguache and Summit Counties. N. to Canada.  
 689. *Lycæna battoides* Behr., near Swift Creek. Also in California and Nev.  
 690. " *melissa* Edw., Rosita (Nash); near Swift Creek. F. to Montana, E. to Kansas, S. to Arizona.  
 691. *Lycæna sagittigera* Feld., Rosita (Nash). Also in Nevada and Cal.  
 692. " *acmon* Dbl. and Hew., West Cliff, May 25, on dry bench above creek; also high-alpine. N. to Washington.  
 693. *Lycæna pseudargiolus* var. *violacea* Edw. N. to Alaska.  
 694. " *comyntas* Gdt., Rosita (Nash). Also in Atlantic States.

## HESPERIDÆ.

695. *Thymelicus garita* Reak., Rosita (Nash). N. to Canada.  
 696. *Pamphila uncas* Edw., West Cliff, May 25, on the dry bench above creek, abundant at flowers of *Senecio* and *Erysimum*. N. to Canada.  
 697. *Pamphila colorado* Scudd., Rosita (Nash). N. to Washington.  
 698. " *rhesus* Edw., Rosita (Nash). S. to Arizona.  
 699. " *draco* Edw., Rosita (Nash). Colo. only (W. H. Edw., 1884).  
 700. *Pyrgus tessellata* Scudd., Rosita (Nash). N. to Canada, also southward.  
 701. " *cæspitalis* Bdv., Willow Creek. This species extends downwards, Mr. Nash having taken it at Pueblo. N. W. to Oregon, W. to Cal.  
 702. *Nisoniades juvenalis* Fab. Widely distributed, Quebec, Fla., Ariz., etc.  
 703. " *brizo* B. and L., Rosita (Nash). N. to Canada.  
 704. " *pacuvius* Lintn., Rosita (Nash). S. to N. Mex. and Arizona.  
 704a. " *icelus* Lintner.  
 704b. " *persius* Scudder.

## SPHINGIDÆ.

## CHÆROCAMPINÆ.

705. *Deilephila lineata* Fb., Splaun Ranch, May 18, and common generally.  
 A species of extremely wide distribution, both in altitude and latitude. It is also neotropical.

## SMERINTHINÆ.

706. *Smerinthus cerisyi* var. *astarte* Streck. This species is boreal. I only took one imago, but the larva was not uncommon.

The late Mr. W. S. Foster informed me that he found *Paonias myops* at Salida, in the lower mid-alpine of Chaffee County.

In "Entom. News," 1891, pp. 190-192, Mr. D. Bruce has a most interesting list of the Sphingidæ of Colorado; would that he more often gave us the benefit of his great knowledge of western Lepidoptera and their habits! There is, however, one thing in the article referred to that I wish to complain of: *Triptogon occidentalis* and *Paonias myops* are said to be "common throughout the State," and there are similar statements regarding several other species. In respect to *D. lineata*, the remark "abundant everywhere," may be allowed to pass; but do *T. occidentalis* or *P. myops* go above the sub-alpine and lower mid-alpine zones respectively? I very much doubt it, especially in the case of the former, although, of course, I would at once cease to question if Mr. Bruce gave definite facts to the contrary. Should it not rather



have been said "Common throughout the State *at suitable elevations?*" Mr. Bruce is by no means specially to blame in regard to looseness of statement; many of our best writers, now and in the past, have been content to jump at conclusions, and assert that insects inhabited "the whole Rocky Mountain region," or "the whole United States," without anything like the amount of information to justify such statements. Owing to this prevalent looseness of statement, accuracy about localities has not been valued, and the science of geographical distribution has suffered greatly.

#### SESIIDÆ.

707. *Sesia* n. sp., Ckll.; see "Entom." 1891, p. 229 (foot-note).  
 708. *Sesia* aff., sp., with orange wings and strongly pectinated antennæ; near Ula.  
 708a. *Sesia* sp., near *hyloformis* Walk., but bands on abdomen silvery.  
 708b. *Sesia* n. sp. aff. *pyramidalis* Walk.  
 708c. *Euhyparpax rosea* Beut. Described from a West Cliff specimen in Bull. Amer. Mus. Nat. Hist., February, 1893, p. 19.  
 708d. *Pyrrhotænia coloradensis* Beut. Described from a Wet Mountain Valley specimen in Bull. Amer. Mus. Nat. Hist., February, 1893, p. 25.

#### PERICOPIDÆ.

709. *Gnophæla vermiculata* Grt. and Rob., abundant; moth bred July 4, and June 28. Also high-alpine.

#### LITHOSIIDÆ.

710. *Lithosia cephalica* Grt. and Rob., Cusack Ranch, Willow Creek, August.

#### ARCTIIDÆ.

711. *Euprepia* (*Platarctia*) *hyperborea* Curt., Short Creek, Cusack Ranch.  
 712. *Arctia blakei* Gr.  
 713. " *figurata* Drury. One specimen, referred by the late Mr. Hy. Edwards to *A. f.-pallida* Streck.  
 714. *Arctia dieckii* Neum.? Cusack Ranch, August (M. E. Cusack); perhaps not distinct from the last.  
 715. *Leptarctia californiæ* Walk., near Swift Creek, named for me by Mr. Hy. Edwards as *L. lena* Bdv.  
 716. *Nemeophila petrosa* Walk.  
 717. *Halisiodota maculata* Harr., the imago taken, and also bred from cocoon found on Round Mountain, Silver Cliff.

#### SATURNIIDÆ.

718. *Attacus gloveri* Streck.; see 6th Rep. Colo. Biol. Asso'n, Rosita (Nash); near Ula. Also down to Canon City and Pueblo (Nash).  
 719. *Pseudohazis eglanteria* Bdv., Rosita (Nash). Also at Manitou (Packard).

#### LASIOCAMPIDÆ.

720. *Clisiocampa californica*\* Pack.; common about West Cliff, etc.; abundant near San Francisco (Stretch).

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\* *Clisiocampa incurva* Hy. Edw. I sent Mr. H. G. Dyar some specimens from Wet Mountain Valley which I had supposed to belong to *californica*, and he informs me that they are typical *incurva*.



721. *Clisiocampa* sp.; see 4th Rep. Colo. Biol. Asso'n.

The larva of *C. californica*, when newly hatched, is about 2 mm. long, dull black, with long pale hairs.

#### AGARISTIDÆ.

722. *Alypia lorquinii* G. and R., Rosita (Nash). Also at Marshall Pass (Foster).

At lower altitudes this species seems to be replaced by *A. octomaculata*, which Mr. Nash found at Pueblo, and Mrs. Cusack at Colorado Springs.

#### COSSIDÆ.

723. *Hypopta bertholdi* Grote, Cusack Ranch, frequent.

Several specimens of a moderately large Cossid larva, red in color, with a curious caudal horn having an upward curve, were found near the Cusack Ranch on April 1, 1888.

#### HEPIALIDÆ.

724. *Hepialus hyperboreus* Moeschl.

#### NOTODONTIDÆ.

725. *Cerura* sp.

I am sorry my list of the Bombycoid groups is so incomplete. The late Mr. W. S. Foster gave the following list of species which he had taken at Salida, in the lower mid-alpine of Chaffee County, about thirty-five miles northwest of Wet Mountain Valley,—*Attacus gloveri*, *Gloveria arizonensis*, *Seirarctia clio*, *Halisidota trigona*, *H. argentata*, *H. ambigua*, *Ctenucha venosa*, *Cossus reticulatus*, *Arachnis picta* and *Euprepia caia* var. *americana*. *Hemileuca maia* var. *nevadensis* was taken by Mr. Nash in Huerfano County (which borders on Custer County to the south) and at Pueblo. *Ecpantheria reducta* (= *permaculata*), which has been recorded from the Platte Canon, was also found at Salida by Mr. Foster.\*

#### NOCTUIDÆ.

726. *Peridroma saucia* Hbn.

727. *Noctua clandestina* Harris.

- 727a. *Carneades satis* Harv.? Sent to Mr. Hy. Edwards.

728. *Chorizagrotis auxiliaris* Grt.; Cusack Ranch, June 18, abundant. Also high-alpine.

729. *Chorizagrotis introferens* Grt.

- 729a. *Tarache angustipennis* Grt.? Sent to Mr. Hy. Edwards.

730. *Hydrœcia nictitans* var. *erythrostigma* Haw., Willow Creek, Cusack Ranch; Short Creek, Aug. 22; also European.

731. *Ufeus satyricus* Grt., very common in houses.

732. *Caradrina civica* Grt., West Cliff, June 7. Described from a specimen taken in Colorado by Prof. Snow.

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\* Dr. A. S. Packard, in Ann. N. Y. Acad. Sci. May, 1893, pp. 81-82, 89, gives an account of the larvæ of two moths new to our list. These were found in the vicinity of West Cliff, and are identified as—(1) *Ecpantheria permaculata* (Pack.) (2) *Ctenucha cressonana* Grote?



733. *Calocampa cineritia* Grt. E. to New Jersey. Maine (Mrs. Fernald).  
 734. *Cucullia montanæ* Grt. N. to Montana.  
 735. *Plusia gamma* subsp. *californica* Speyer, Willow Creek, Cusack Ranch; near West Cliff, May 29.  
 736. *Plusia ni* subsp. *brassicæ* Riley, frequently taken; one bred from larva found Aug. 1 at West Cliff; was darker and more suffused than usual, reniform spot rounder below, and separated from orbicular.  
 737. *Plusia u-brevis* Brit. Mus. Cusack Ranch, Aug. 1 (M. E. Cusack).  
 738. *Antaploga dimidiata* Grt. Originally described from a specimen taken by Prof. Snow in Colorado.  
 739. *Copablepharon subflavidens* Grt., West Cliff, July 25. The specimen is now in Brit. Mus.  
 740. *Heliothis armiger* Hbn. Also European and in the tropics; cosmopolitan.  
 741. " " var. *umbrosa* Grt.  
 741a. *Anomis erosa* Hbn.? Sent to Mr. Hy. Edwards.  
 742. *Pseudanthœcia tumida* Grt.  
 743. *Drasteria erechtea* Cram. E. to New Jersey, etc., widely distributed.  
 744. *Catocala mariana* Hy. Edw., Willow Creek, Cusack Ranch, Aug. 26.  
 745. " *briseis* var. *grotiana* Bailey, Short Creek, Cusack Ranch, Aug. 30. *C. briseis* occurs in New Jersey.  
 746. *Erebus odora* L., var. at light, West Cliff, July 30 (Mrs. Charlton).

This specimen has a strong white belt on both wings; whiter and better developed than in any of the Jamaican examples I have seen. Mr. Grote wrote in "Can. Ent." 1887, p. 220, "*Erebus odora* may breed in So. Colorado."

747. *Homopyralis discalis* Grt.  
 748. *Bleptina caradrinalis* Gn., var. The species is in the N. J. list.

*Peridroma saucia* is quoted by Prof. Smith from North and South America, Europe and Asia—a sufficiently wide distribution! *Noctua clandestina* is boreal and widely diffused in N. Amer., where it appears to represent the European *Agrotis obscura* (= *ravida*). The two species are so much alike that Mr. Tutt ("British Noctuæ," vol. ii), judging from superficial appearances, does not separate them; but according to Speyer and Smith, there are good structural characters in the male, making it impossible to rank the two forms as specifically identical. *Chor. auxiliaris* and *C. introferens* both extend to Texas and California. So, of four species of *Agrotis* sens. lat., one is boreal and circumpolar, one is boreal American, and two are western.

## GEOMETRIDÆ.

### ENNOMINÆ.

749. *Prochærodes catenulata* Grt.  
 750. *Tetracis* sp.  
 751. *Endropia madusaria* Walk., Cusack Ranch (M. E. Cusack). E. to New Jersey (Smith).  
 752. *Metrocampa margaritata* var. *perlata* Gn., Cusack Ranch (M. E. Cusack) and elsewhere; at light, July 5. The species is European.  
 753. *Sicya macularia* Harr. E. to New Jersey.  
 754. *Lychnosea helveolaria* Hulst, Cusack Ranch, at light, Aug. 2.



## GEOMETRINÆ.

755. *Aplodes junctolinearia* Graef, Cusack Ranch (M. E. Cusack).  
 756. *Chlorosea bistriaria* Pack., West Cliff, July 29, at rest on *Senecio douglasii* var.; also at light.

## ACIDALINÆ.

757. *Ephyra plantagenaria* Hulst.

## CABERINÆ.

758. *Deilinia variolaria* Gn., June 26, etc. E. to New Jersey.  
 759. " *erythremaria* Gn. E. to New Jersey.  
 760. *Semiothisa respersata* Hulst, West Cliff, May 25.  
 761. *Phasiane curvata* Grt., Cusack Ranch (M. E. Cusack).  
 762. *Marmopteryx formosata* Streck., Cusack Ranch (M. E. Cusack), and elsewhere in that vicinity, not uncommon.  
 763. *Thamnonoma flavicaria* Pack., West Cliff, July 26, both sexes taken flying amongst *Ribes aureum*.  
 764. *Selidosema juturnaria* Gn., bet. Wolff's Cabin and Smith's Park, Aug. 7.  
 765. *Fidonia fimetaria* G. and R.  
 766. *Gorytodes trilinearia* Pack., one taken, 1889.  
 767. *Caripeta niveostriata* Hulst MS., Cusack Ranch (R. Cusack); wings red-brown, streaked with white.

## LARENTINÆ.

768. *Lithostege virginata* Graef., Cusack Ranch (M. E. Cusack).  
 769. *Philereme californiata* Pack., Cusack Ranch, Willow Creek, Aug. 19.  
 770. *Petrophora testata* L., Short Creek, Cusack Ranch, Aug. 21.  
 771. " *populata* L., near Swift Creek, frequent.  
 772. " *prunata* var. *nubilata* Pack., Cusack Ranch (M. E. Cusack).  
 773. " *montanata* Bork., Willow Creek, Cusack Ranch, August.  
 774. *Glaucopteryx cæsiata* Bork., var.  
 775. *Eupithecia implicata* Walk.

*P. populata* and *G. cæsiata* are recorded by Packard from Labrador. These, with the other species of *Petrophora*, are probably circumpolar; they afford an instance of variable species inhabiting a wide area, the varieties not giving rise to distinct new species, but rather to local races. Butler ("Papilio," 1881, p. 222) has expressed some doubt as to whether the American species called "*cæsiata*" is identical with that of Europe.

## PYRAUSTIDÆ.

776. *Nomophila noctuella* S. V., quite common; Cusack Ranch, August (M. E. Cusack); West Cliff, May 25; July also. Also European, etc.  
 777. *Pyrausta inæqualis* Gn. E. to New Jersey (Smith).  
 778. " *borealis* Pack., West Cliff, July 31, and July 27, at light. Goes northeast to Labrador (Packard).  
 779. *Pyrausta augustalis* Grt.  
 780. " *signatalis* Walk., West Cliff, July 31, at light.  
 781. " *magdalena* Fern.?, named for me as *plumbofascialis*, and therefore I suppose is *magdalena*; see "Can. Ent." 1892, p. 122.



782. *Pyrausta mustelinalis* Pack., Cusack Ranch (M. E. Cusack).  
 783. " *fumoferalis* Hulst, Cusack Ranch.  
 784. *Loxostege chortalis* Grt. E. to New Jersey (Smith).  
 785. " sp., larva injures alfalfa; see 1st Rep. Colo. Biol. Asso'n.  
 786. " *sticticalis* L., West Cliff, July 31, at light; Cusack Ranch (M. E. Cusack). E. to New Jersey (Smith).  
 787. *Loxostege cereal* Zell., West Cliff, etc., abundant; May 23. E. to N. J.  
 788. *Scoparia centuriella* S. V., Cusack Ranch, Willow Creek, August.

## PHYCITIDÆ.

## PHYCITINÆ.

789. *Dioryctria actualis* Hulst, West Cliff, early in June; named for me as *actuella*.  
 790. *Megasis atrella* Hulst, described from a specimen sent to Mr. Hy. Edwards, but now in Mr. Hulst's collection. Phycitidæ N. A., p. 166.  
 791. *Plodia interpunctella* Hbn., West Cliff (introduced); larvæ found at West Cliff in a box of crackers from Denver. E. to N. J. (Smith).

## PEORIINÆ.

792. *Ragonotia saganella* Hulst, West Cliff, May 24, at light; see Hulst, Phycitidæ of N. A., p. 205.  
 793. *Altoona ardiferella* Hulst, West Cliff, at light, July 31; this was only the second specimen known.

## CRAMBIDÆ.

794. *Crambus innotatellus* Walk., West Cliff, amongst herbage, July 26 and Aug. 1.  
 795. *Crambus ruricolellus* Zell., West Cliff, Aug. 1.  
 796. " *caliginosellus* Clem., West Cliff, at light, July 31. E. to New Jersey (Smith).  
 797. *Crambus luteolellus* var. *ulæ* Ckll., the original specimen was sent to Prof. Fernald. It seems to me to be a distinct variety, but I judge only from a comparison of descriptions; see "Ent. Mo. Mag." May, 1888, p. 272.

## PTEROPHORIDÆ.

798. *Platyptilia carduidactyla* Riley, Cusack Ranch.  
 799. *Ædematophorus griseus* Walsm., Willow Creek, Cusack Ranch, Aug. 25.  
 800. " *inquinatus* Zell. (= *ambrosiæ* Murtf.), near West Cliff; the specimen now in Lord Walsingham's collection.  
 801. *Leioptilus helianthi* Wlsm., Short Creek, Cusack Ranch, Aug. 21.  
 802. " *subochraceus* Wlsm., Smith's Park, Aug. 7.  
 803. " *sulphureodactylus* Pack., a specimen found at Ula, July 30, is probably this.

A *Platyptilia*, not identified (the specimen is with Lord Walsingham), was bred from larva on *Castilleja pallida* var. *acuminata* at West Cliff.

## ORNEODIDÆ.

804. *Orneodes hexadactyla* L., West Cliff, etc., common; Cusack Ranch, Aug. 2; West Cliff, July 31; abundant, April 3. Also European; see "Ent. Mo. Mag." 1889, p. 213.



## TORTRICIDÆ.

805. *Ptycholoma persicana* Fitch. E. to New Jersey (Smith).  
 806. *Sericoris vetulana* Wlsm., Cusack Ranch, Aug. 2.  
 807. *Pædisca ridingsana* Rob., West Cliff, July 29.  
 808. " *fernaldana* Grt., Cusack Ranch, Aug. 2.  
 809. " *culminana* Wlsm., Cusack Ranch, Willow Creek.  
 810. *Semasia olivaceana* Riley, Cusack Ranch, Willow Creek.  
 811. " *tarandana* Moeschl., West Cliff, May 24.  
 812. *Carpocapsa pomonella* L., West Cliff (in imported apples). A European species. Not really belonging to the fauna of our district.

## PLUTELLIDÆ.

813. *Plutella cruciferarum* Zell., West Cliff, May 25, locally abundant; also European.

## GELECHIIDÆ.

814. *Psecadia semilugens* Zell.  
 815. *Walshia amorphæella* Clem., Willow Creek, Cusack Ranch, August.  
 816. *Gelechia gallæ-solidaginis* Riley, galls only found. E. to New Jersey (Smith).  
 817. *Depressaria* sp., at light, April 12. I may have taken more than one species of this genus. One specimen was referred with doubt to *D. hilarella* Zell.

## LAVERNIDÆ.

818. *Laverna definitella* Zell., Willow Creek, Cusack Ranch, August.

## LITHOCOLLETIDÆ.

819. *Lithocolletis* sp., on *Populus tremuloides*.  
 820. " sp., on *Salix*.

## COLEOPHORIDÆ.

821. *Coleophora* sp., larvæ in cases on *Bigelovia*, West Cliff.

## HETEROPTERA.

Of 43 species identified, 28 are boreal or widely distributed, 13 are western, and 2 southern.

## SCUTELLERIDÆ.

822. *Homæmus bijugis* Uhler, on timothy grass, ♂ and ♀, Cusack Ranch, Willow Creek, Aug. 21.  
 823. *Eurygaster alternatus* Say. Northeast to Muskoka Lake District, Can. (Van Duzee); also in Summit County.

## CORIMELÆNIDÆ.

824. *Corimelæna nitiduloides* Wolff. East to New Jersey (Smith),

## PENTATOMIDÆ.

## ASOPINÆ.

825. *Perillus confluens* H.-Sch. Uhler gives "S. W. States."



826. *Perillus exaptus* Say, Ula, Nov. 12. E. to New Jersey region\* (Smith).

PENTATOMINÆ.

827. *Euchistus variolarius* Pal. Beauv., West Cliff, May 23, by sweeping *Thermopsis*. E. to New Jersey (Smith).  
828. *Hymenarcys æqualis* Say, near West Cliff, July 30. E. to New Jersey region (Smith).

COREIDÆ.

ALYDINÆ.

829. *Alydus eurinus* Say, Ula, July 30. Also high-alpine; but in Mesa County at about 7000 feet. Northeast to Muskoka Lake District, Canada (Van Duzee).

RHOPALINÆ.

830. *Harmostes reflexulus* Stal., near West Cliff, end of July. Uhler writes "Western States."  
831. *Corizus hyalinus* Fb., Ula, July 30. Also high-alpine. "Western States" (Uhler, Check-List, 1886).

LYGÆIDÆ.

NYSIINÆ.

832. *Nysius* sp., Ula, July 30.

CYMINÆ.

833. *Cymus luridus* Stal., near West Cliff, end of July. N. E. to Muskoka Lake District (Van Duzee).

GEOCORINÆ.

834. *Geocoris decoratus* Uhl., Ula, Nov. 12. "Western States" (Uhler, Check-List).

MYODOCHINÆ.

835. *Pamera fallax* Say. Not in Uhler's Check-List.  
836. *Emblethis arenarius* L. E. to New Jersey region (Smith).  
837. *Peritrechus fraternus* Uhl., Ula, Nov. 12. E. to N. J. region (Smith).  
838. *Eremocoris ferus* Say. E. to New Jersey region (Smith).

LYGÆINÆ.

839. *Melanocoryphus facetus* Say. Also in Chaffee County. "Southern States" (Uhler).  
840. *Melanocoryphus admirabilis* Uhl., Ula, Nov. 12. "Western States" (Uhler).  
841. *Lygæus kalmii* Stal. E. to New Jersey region (Smith).  
842. " *reclivatus* Say, Ula, Nov. 12. "Western States" (Uhler). Also at Fort Collins (Riley and Blount).

*L. turcicus* Fab., occurs at the lower end of Wet Mountain Valley, just in Fremont County.

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\* Prof. Smith includes in his New Jersey Catalogue (1890) many species which "may reasonably be expected to be found," but have not actually occurred in the State. This method is rather confusing, and likely to lead to errors of citation, but for present purposes it is enough to cite as above.



## CAPSIDÆ.

## MININÆ.

843. *Miris affinis* Reut., Ula, July 30. N. E. to Muskoka Lake District (Van Duzee).

## LOPARIINÆ.

844. *Lopidea media* Say, on *Glycyrrhiza lepidota*, etc., West Cliff, July 31. E. to New Jersey region (Smith). Down to Pleasant Valley, Fremont County.
845. *Hadronema militaris* Uhl., Smith's Park, Aug. 6. Also high-alpine. "Western States" (Uhler).

## PHYTOCORINÆ.

846. *Calocoris rapidus* Say. N. E. to Muskoka Lake District (Van Duzee).
847. " *superbus* Uhl., West Cliff, July 31. "Western States" (Uhler)
848. " sp. probably var. of *rapidus*, West Cliff, May 23, by sweeping *Thermopsis*.

## CAPSINÆ.

849. *Lygus annexus* Uhl. "Western States" (Uhler).
850. " *pratensis* L., var. West Cliff, July 27. Also high-alpine; and N. E. to Muskoka Lake District (Van Duzee).
851. *Lygus pratensis* var. *lineolaris* (Pal. Beauv.).
852. *Poeciloscytus unifasciatus* Fab., Smith's Park, Aug. 6, Muskoka Lake District (Van Duzee).
853. *Poeciloscytus* sp., West Cliff, July 27.
854. *Capsus brachycorus* Uhl., near West Cliff, end of July. "Western States" (Uhler).  
*Lygus diffusus* Uhl., is high-alpine in Custer County.

## CALLECORINÆ.

855. *Sthenarops chloris* Uhl., West Cliff, by sweeping herbage, July 25. E. to New Jersey region (Smith).
856. *Stiphrosoma stygica* Say, West Cliff, July 27; Ula, July 30. N. E. to Muskoka Lake District (Van Duzee).

## PLAGIOGNATHINÆ.

857. *Plagiognathus obscurus* Uhl., West Cliff, July 27. N. E. to Muskoka Lake District (Van Duzee).

## ACANTHIIDÆ.

## ANTHOCORINÆ.

858. *Anthocoris musculus* Say. N. E. to Muskoka Lake District (Van Duzee).
859. " *melanocerus* Reut., West Cliff, May 22. Also high-alpine, Uhler (Check-List) gives only Colorado. I also found it at the mouth of Slate Creek, Summit County, amongst willows, on Aug. 27.

## CIMICINÆ.

860. *Cimex lectularius* L., West Cliff, too frequent.

## TINGITIDÆ.

## PIESMINÆ.

861. *Piesma cinerea* Say, West Cliff, July 27. E. to New Jersey region (Smith).



## TINGITINÆ.

862. *Corythuca ciliata* Say. E. to New Jersey region (Smith).  
 863. " sp., body black, legs and antennæ dark brown, elytra white, on  
*Cnicus*, in numbers. West Cliff, June 12 (? = *ciliata* Say).

## ARADIDÆ.

864. *Aradus* sp. The species from our district was not identified. In Delta County I found *A. tuberculatus* Kirby, and in Summit County *A. rectus* Say.

## NABIDÆ.

## CORISCINÆ.

865. *Coriscus inscriptus* Kirby, West Cliff, July 27. Also sub-alpine; also in Chaffee, Gunnison and Pueblo Counties.  
 866. *Coriscus ferus* L., Ula, Nov. 12, West Cliff.  
 Both these species are recorded by Mr. Van Duzee ("Can. Ent." 1889, p. 5) from the Muskoka Lake District, Canada.

## REDUVIDÆ.

## ACANTHASPIDINÆ.

867. *Conorhinus* sp. The genus is southern and neotropical.

## HYDROBATIDÆ.

868. *Limnotrechus marginatus* Say, common on Grape Creek, West Cliff, May 25. N. E. to Muskoka Lake District (Van Duzee).

## VELIIDÆ.

869. *Hebrus sobrinus* Uhl., Ula, Nov. 12, a specimen doubtfully referred to this. "Western States" (Uhler).

## SALDIDÆ.

870. *Salda interstitialis* Say, Ula, Nov. 12. N. E. to Muskoka Lake District (Van Duzee).  
 871. *Salda humilis* Say, West Cliff, July 31: E. to New Jersey region (Smith).

**HOMOPTERA.**

## CICADIDÆ.

872. *Cicada* sp., on *Populus tremuloides*.

## MEMBRACIDÆ.

## SMILIINÆ.

873. *Publilia modesta* Uhl., on *Gymnolomia multiflora*, Cusack Ranch.  
 874. *Stictocephala* sp.

## CECROPIDÆ.

## GLYPONINÆ.

875. *Xerophloea peltata* Uhl.



## TETTIGONINÆ.

876. *Proconia costalis* Fab., Ula, Nov. 12; West Cliff, March 31. Also sub-alpine; and E. to New Jersey region (Smith).  
 877. *Tettigonia limbata* Say.  
 877a. *Diedrocephala mollipes* Say.

## BYTHOSCOPIDÆ.

878. *Bythoscopus clitellarius* Say.  
 879. " sp., near West Cliff.  
 880. *Idiocerus alternatus* Fitch, West Cliff, July 31. Also high-alpine. Recorded rather doubtfully by Mr. Van Duzee from the Muskoka Lake District, Canada. New Jersey region (Smith).  
 880a. *Pachyopsis lætus* Uhler.

## PSYLLIDÆ.

## APHALARINÆ.

881. *Aphalara harrisii*, near West Cliff.  
 882. " *marginata* Riley.

## APHIDIDÆ.

## APHIDINÆ.

883. *Aphis brassicæ* L., on cabbage; see 3d Rep. Colo. Biol. Asso'n.  
 884. *Siphonophora* sp., on *Gymnolomia multiflora*, Cusack Ranch.  
 885. *Aphis* (sens. Linn.) sp., dull bluish green, darkish on back, on *Clematis douglassii*, Beddoes' Old Ranch.  
 886. *Aphis* sp., bright scarlet, femora and tibiæ pale brown, tarsi blackish, wings hyaline, on *Rudbeckia laciniata*, Beddoes' Old Ranch.  
 887. *Aphis* sp., dull gray or dark sepia brown, rather elongated, on *Echinosperrum floribundum*, below the Micawber.  
 888. *Aphis* sp., gray, wings hyaline, veins not darkened, on *Gentiana heterosepala*, near Wolff's Cabin.  
 889. *Aphis* sp., rather large, yellowish green, very shiny, tarsi black or blackish, on *Erigeron glabellus* var. *mollis*, near Smith's Park.  
 890. *Aphis* sp., dark brown, younger ones dark gray with darker legs, on *Arabis*, near Smith's Park.  
 891. *Aphis* sp., green, femora partly black, on *Arabis*, above Smith's Park.  
 892. " sp., small, dark gray or black, crowded on underside of leaves of *Salix*, near West Cliff.  
 893. *Aphis* sp., black, wings hyaline, young gray, on undersides of leaves of *Cornus stolonifera*, Willow Creek.  
 894. *Aphis* sp., dull brownish-vinous, head bluish gray, on underside of leaf of *Lonicera involucrata*, Willow Creek.  
 895. *Aphis* sp., smallish, oval, wings hyaline, slightly grayish, body dark lead gray, tibiæ and basal half of antennæ very pale yellowish, in vast numbers on the leaves of *Veratrum californicum*, Willow Creek.  
 896. *Aphis* (sens. Linn.) sp., dull scarlet, legs and antennæ blackish, but basal half of femora pale yellowish; one that had just cast its skin had legs and antennæ entirely pale yellowish, cast skin whitish, with dark legs and antennæ; on involucre of *Solidago*, Willow Creek.



897. *Aphis* sp., dark gray with pale legs and antennæ; on *Epilobium angustifolium*, Willow Creek.
898. *Aphis* sp., large, pale whitish green, with a green dorsal line, legs long, tarsi black; on *Thermopsis*, Willow Creek.
899. *Aphis* sp., head and thorax red-brown, abdomen dark purplish gray, on *Cnicus ochrocentrus*, Ula, July 30.
900. *Aphis* sp., dark gray, the young slightly brownish, on *Astragalus*, Ula, July 30.
901. *Aphis* sp., very dark brownish gray, on *Castilleja integra* var. *gracilis*, Cusack Ranch, Aug. 3.
902. *Aphis* sp., elongate-oval, black, on *Populus tremuloides*, September 13.

## COCCIDÆ.

## LECANIINÆ.

903. *Orthezia occidentalis* Dougl., found in nest of dark brown ant with large head and shiny abdomen. Specimens are in Brit. Mus. and U. S. Nat. Mus.; see "Ent. Mo. Mag." Sept., 1891, p. 245.
904. *Pulvinaria*\* n. sp., on *Bigelovia* at West Cliff. Specimens with Mr. Douglas.

## COCCINÆ.

905. *Coccus cacti*† L., "Ent. Mo. Mag." 1889, p. 382. No adults in condition for examination were found, but I think the species is correctly identified.

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\* P. S., June, 1893. I have now received excellent specimens of the *Pulvinaria*, and am able to submit a description.

*Pulvinaria bigeloviæ* n. sp., ♀ with ovisac 10 mm. long. Scale dark brown. Ovisac white, elongate, firm, obscurely grooved, parallel sided. Boiled in caustic soda, the scale turns the liquid pink. Antennæ 8-jointed, joints 2 and 3 subequal and longest; 4 shorter than 3, but longer than 5; 5 and 8 subequal; 6 and 7 subequal and shortest; 8 seems as if divided into two; 8 bears several rather short hairs; 4 and 5 each with a short bristle; 2 with two short bristles. Tarsus about three-fourths length of tibia. Femur stout, very little longer than tibia. Claw large, tarsal knobbed hairs and digitules of claw fairly stout, with distinct knobs. Tarsal knobbed hairs rather short, extending only as far as the digitules. Tibia with three bristles on innerside. Trochanter with one long hair. Anal plates pale brown, short, posterior external side a little longer than anterior external side. Anal ring with six stout bristles. Lower lip with two spines on each side, one subterminal, the other lateral, margin with a few small simple spines.

Described from specimens found by Mr. Frank Cusack, at West Cliff, June 16.

In size and general appearance this species reminds one of *P. urbicola* Ckll., which is found on *Capsicum* in Jamaica.

† P. S., July 5.—What has been called *Coccus cacti* proves to consist of at least three species, and there is no reason to suppose that the true *C. cacti*, as described by Signoret, occurs in the Rocky Mountain region. Dr. A. Dugès has found a species at Guanajuato, Mex., which Lichtenstein, in 1884, referred to *Acanthococcus tomentosus* (= *Coccus tomentosus* Lam., considered by Signoret a synonym of *cacti*). Dr. Dugès has kindly sent me specimens of this species, which is certainly distinct from *cacti*. At Las Cruces, N. Mex., I have found a species congeneric with, but distinct from, *A. tomentosus*; this I propose to call *A. confusus*.



906. *Rhizococcus* n. sp., under a rock, West cliff, April 23, 1890. Naked, pyriform,  $2\frac{1}{4}$  mm. long, dull lilac, legs clear red-brown, antennæ reddish brown. Caudal filaments short, but distinct. This must be new, but unfortunately the only specimen was accidentally lost, and no proper description can be drawn up.

## DIASPINÆ.

907. *Chionaspis salicis* L., on willow at West Cliff.

On lemons exposed for sale in the shops were found *Mytilaspis citricola* and *Aspidiotus nerii*, but these of course do not belong to the fauna.

## DIPTERA.\*

## CECIDOMYIDÆ.

908. *Cecidomyia rigidæ* O. S., West Cliff; see "Entom." p. 1890, 278.  
 909. " *salicis-batatas* Walsh; see "Entom." 1890, p. 279.  
 910. " *salicis-brassicoides* Walsh; see "Entom." 1890, p. 280.  
 911. " *frater* Ckll., "Entom." 1890, p. 280. Type in Brit. Mus.  
 912. " *salicis-nodulus* Walsh?; see "Entom." 1890, p. 75.  
 913. " *salicis-hordeoides* Walsh?  
 914. " *bigeloviæ* Ckll., "Ent. Mo. Mag." 1889, July, p. 324; Aug. p. 363; "W. Am. Sci." 1889, p. 106; "Ent. Mo. Mag." 1890, p. 109. Specimens in Brit. Mus.  
 915. *Cecidomyia alticola* Ckll., "Entom." 1890, p. 281. Type now in Brit. Mus.  
 916. " *albovittata* Walsh?; "Entom." 1890, p. 282.  
 917. " sp., galls on *Geranium*; imago unknown.  
 918. " ? sp., gall on *Populus tremuloides*.  
 919. *Hormomyia salicum* Ckll. A problematical species, the gall only being known. Trans. Ent. Soc. Lond., 1890, xvi-xvii.

## MYCETOPHILIDÆ.

920. *Leja* sp., near West Cliff.

## SIMULIIDÆ.

921. *Simulium* sp., attacking horses, July 8; see 2d Rep. Colo. Biol. Asso'n.

## CULICIDÆ.

922. *Culex* sp.

## CHIRONOMIDÆ.

923. *Ceratopogon* sp., figured in 13th Rep. Colo. Biol. Asso'n; see also 2d Rep. n. sp. It differs from *tomentosus* in the secretion of the individuals being very abundant, so that they cannot easily be separated from one another, the white cottony matter from several being fused together; also in the more slender legs; and in the narrower and longer truncate spines or processes; and apparently in the fewer joints of the antennæ. The Wet Mountain Valley insect is in all probability identical with *A. confusus*.

\* Prof. C. H. T. Townsend has lately identified the following Diptera, collected by me in Wet Mountain Valley: *Sarcophaga* sp., 12 mm. long, ♀. *Cleigastra* sp. *Schoenomyia* sp. "Appears to belong to this anthomyiid genus, but does not agree with the characters wholly, 8 mm. long and very bristly." *Jurinia algens* Wd. *Onesia* sp.? ♂. *Caricea* sp.? ♀. *Cyrtoneura* sp. ♀.



## TIPULIDÆ.

924. *Tipula* sp.

## TABANIDÆ.

925. *Tabanus* sp., near *affinis*.  
 926. " sp.  
 927. *Chrysops* sp., common and very troublesome; called "deer fly."

## LEPTIDÆ.

928. *Chrysopila* sp., near West Cliff.

## ASILIDÆ.

929. *Cyrtopogon*? sp.  
 930. *Stenopogon* sp., "Can. Ent." 1889, p. 60.

## EMPIDÆ.

931. *Tachydromia* sp., near West Cliff.

## DOLICHOPODIDÆ.

932. *Argyra*? sp., near West Cliff.

## SYRPHIDÆ.

933. *Crioprora cyanogaster* Lw., West Cliff. E. to New Jersey (Smith).  
 934. *Eristalis hirtus* Lw., see 8th Rep. Colo. Biol. Asso'n.  
 935. *Melanostoma cærulescens* Willist., see 8th Rep. Colo. Biol. Asso'n.  
 936. *Microdon* n. sp. Specimen in Brit. Museum.  
 937. *Volucella* sp.; colored like *Bombus rufocinctus*.

## TACHINIDÆ.

938. *Gonia exul* Willist., West Cliff, May 16.  
 939. " *frontosa* var. *atra* Ckll., 10th Rep. Colo. Biol. Asso'n; "West Am. Sci." 1889, September, p. 106.  
 940. *Dejeania vexatrix* O. S., see 8th Rep. Colo. Biol. Asso'n.

## SARCOPHAGIDÆ.

- 984.\* *Sarcophaga* sp.

## DEXIIDÆ.

985. *Dexia* sp.

## MUSCIDÆ.

941. *Lucilia cæsar* L.  
 942. *Musca domestica* L.  
 943. " sp.

## ANTHOMYIDÆ.

944. *Anthomyia* sp., near West Cliff.

## CORDYLURIDÆ.

945. *Scatophaga* sp.

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\* This and some others whose numbers do not come in their proper order, were added since the list was made up. The same is the case with a few species whose numbers are followed by a letter.



## MICROPEZIDÆ.

946. *Calobata* sp. Specimen sent to Dr. Riley.

## TRYPETIDÆ.

- ✓ 947. *Scriptotricha culta* Wied., found ovipositing in thistle buds, July 9; see also 6th Rep. Colo. Biol. Asso'n. S. to Carolina and Texas.  
 ✓ 948. *Trypeta bigeloviæ* Ckll., West Cliff, common; Dora; Round Mountain.  
 ✓ 949. " " var. *disrupta* Ckll., with the type; see "Ent. Mo. Mag." 1890.  
 ✓ 950. *Trypeta*? sp., a supposed Trypetid gall on *Oxytropis lambertii*, imago unknown.  
 ✓ 951. *Trypeta* sp., aff. *humilis* Lw., near West Cliff.

## PIOPHILIDÆ.

952. *Piophila* sp., near West Cliff.

## PULICIDÆ.

953. *Pulex sciuri*?, on *Tamias lateralis*.  
 954. " *serraticeps*?  
 955. " sp., on fowls; see 9th Rep. Colo. Biol. Asso'n.

## ARACHNIDA.

## ARANEÆ.

956. Dictynidæ: *Dictyna* sp.  
 957. Agalenidæ: *Agalena nævia* Walck.  
 958-62. Theridiidæ: *Theridium* sp.; *Lithyphantes* sp.; *Euryopsis* sp.; *Linyphia* sp.; *Erigone* sp.  
 963. Epeiridæ: *Epeira* sp.  
 964. Tetragnathidæ: *Tetragnatha* sp.  
 965-69. Thomisidæ: *Xysticus cunctator* Thor.,\* forms *pallidus* Ckll., and *nigrescens* Ckll. (see "Ent. Mo. Mag." 1890, p. 191); *Coriarachne* sp.; *Misumena* sp.; *Philodromus* sp.  
 970-71. Lycosidæ: *Lycosa*, two spp.; *Tarentula* sp.  
 972. Attidæ: gen.? sp.? a species with the dorsum of abdomen red.

## SOLPUGÆ.

973. A large species of this group is found by Swift Creek.

## OPILIONES.

974. *Phalangium* sp.  
 975. *Opilio* sp.  
 976. *Phalangodes robustus* (Pack.). Swift Creek, "Can. Ent." 1889, p. 140.

\* The two forms mentioned may be described, more fully than in the place cited, as follows: (1) *pallidus*. Cephalothorax with a broad dorsal pale band (about  $1\frac{1}{2}$  mm. broad); this band without any distinct markings; lateral bands of cephalothorax gray; abdomen obscurely marbled greenish and paler; legs pale; (2) *nigrescens*. Cephalothorax with the dorsal pale band not reaching its posterior end, but ending posteriorly in a point; this band with markings nearly as in the type; lateral and posterior areas of cephalothorax black, with a little pale marbling above legs; abdomen obscurely marbled reddish brown and paler; legs darker.



## PSEUDOSCORPIONES.

977. gen.? sp.? A dark brown species under rocks, Old Beddoes' Ranch. A different species was found at the Cusack Ranch.

## ACARI.

978. *Ixodes* sp. Only occasionally found.

## MYRIOPODA.

979. *Parajulus venustus* (Wood), see Proc. U. S. Nat. Mus. 1888, p. 343.  
 980. *Geophilus umbraticus* McNeill., see Proc. U. S. Nat. Mus. 1888, p. 346.  
 981. *Lithobius kochi* Stuxb. var. *coloradensis* v. nov., see Proc. U. S. Nat. Mus. 1888, p. 348. Mr. Bollman gave a description of this form, which he at first thought to be a new species, but it differs little from true *kochi*, found at Sancelito, Cal. I give it a varietal name to indicate that there is a difference between the two forms, so widely separated geographically.

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P. S. Dec. 22.—*Photopsis east of Colorado*.—The statement on p. 343, that no *Photopsis* is known east of Colorado, must be modified. In the Washburn College Bulletin for 1886, p. 211, is a list of Hymenoptera found in Barber County, Kansas, in which are included *Photopsis tapajos* Blake, and *P. unicolor* Cress.





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