Contributions to the Natural History of the Rocky Mountains. I

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CONTRIBUTIONS TO THE NATURAL HISTORY OF THE ROCKY MOUNTAINS. I

By T. D. A. Cockerell

ARACHNIDA

A RARE SPIDER AT WARD, COLO.

Ortmann, writing on the distribution of crayfishes (Cambarus), remarks that a common and widely distributed species will often have distinct but allied species occupying smaller areas about the boundaries of its range. *Steatoda borealis* Hentz, a spider of the family Theridiidae, is such a widely distributed form; and in our region has been found at Fort Collins and West Cliff, Colo., and in the White Mountains of New Mexico. At Albuquerque, N. M., Mr. Soltau discovered a new species, *S. grandis* Banks, allied to *S. borealis*. This *S. grandis* has since been found in California, where it is the only known *Steatoda*; so it doubtless has a wide range in the Southwest. From Colorado, Thorell long ago described another species, *S. distincta*, collected at Manitou. This has remained very little known, but I was so fortunate as to rediscover it last July at Ward, the specimen having been identified by Mr. N. Banks. As Ward has an altitude of about 9,000 feet, the species is probably characteristic of the mountains.

AN ADDITION TO THE SPIDERS OF NEW MEXICO

*Ariadne bicolor*, determined by Mr. N. Banks, was collected by Mrs. Cockerell and Miss Mary Cooper at San Geronimo, N. M., a few years ago. This adds a species, genus, and family (Dysderiidae) to the fauna of New Mexico. Since the publication of the list of New Mexico Arachnida, Mr. Banks has described as new two spiders collected by myself: *Lycosa apicata* from Las Vegas and Las Cruces, and *Syspira pallida* from Mesilla Park.

COLEOPTERA

BEETLES NEW TO COLORADO

An admirable list of the beetles of Colorado, by Professor H. F. Wickham, appeared in the *Bulletin of the Laboratories of Natural History* of the Iowa State University, in 1902. Mr. H. C. Fall has kindly identified a few beetles which I have recently collected in Colorado, and some of them appear to be worthy of record. The most interesting is a Carabid, *Bradyellus californicus* Leconte, found at Ward, 9,000 feet. This is a Californian species, quite unexpected in Colorado. Mr. Fall writes concerning the matter: "*B. californicus* and *B. tantillus* cover the country between them. The two are with difficulty separable and are quite likely not distinct. The Ward example is certainly not separable from Californian specimens in my collection."

*Oxalis bicolor*, collected at Boulder, is new to Colorado, being the fourth species of *Oedemeridae* in the list. The genus, which is also new to the list, is southern, and has three species in New Mexico.

Neoclytus approximatus Leconte, is to be recorded from Boulder. The only previous Colorado record was Morrison (Osler).

Orphilus ater, found at Halfway House, Pike's Peak, is new for Colorado.

Languria lacta Leconte, from Boulder, was only known previously in Colorado from near Fort Collins.

Dissonycha triangularis Say, was obtained at Windy Point, Pike's Peak, 12,230 feet. This is much higher than the previous records.

COCCIDÆ

THE GENUS TRIONYMUS, BERG, IN COLORADO

Although the Coccidæ have such limited means of locomotion, many of the genera are exceedingly widely distributed. In a number of cases, this can be readily explained by the fact that they are carried from place to place on cultivated plants; but in other instances no such explanation will suffice. The small genus Trionymus contains at present four species, one found in France, one in Russia, one in the District of Columbia, and the fourth was discovered last year at Boulder, Colo., by Mrs. Cockerell. It may be that these insects are not all genetically related, but represent "convergent evolution," due to similar modes of life; but if this is the case, we have at present no proof of it. The Colorado species has been described as T. nanus Ckll. It is hardly 1½ mm. long, narrow, very pale yellowish, with yellowish secretion. It occurs under rocks in open grassy places. The microscopic measurements (all in μ) are as follows: Antennal joints: (1) 22, (2) 22, (3) 18, (4) 16, (5) 12, (6) 17, (7) 56. Labium: length about 75, breadth about 47. Anterior leg: femur+trochanter, 97; tibia, 50; tarsus (excl. claw), 40.

THE GUTIERREZIA MEALY-BUG AT BOULDER

Gutierrezia is a small perennial composite plant, exceedingly common in New Mexico, and extending northward even to Montana. In New Mexico it was found to be commonly infested by a small mealy-bug (Pseudococcus gutierreziae Ckll.), easily recognized by the conspicuously white linear ovisac. This insect is now found to occur also in Colorado, as I collected specimens this year in Boulder, near the Sanitarium. It must be regarded as one of the distinctly austral elements which so plentifully mingle with the boreal types along the eastern base of the mountains, and which to my mind forbid the extension of the Transition zone so far east in Colorado as Dr. Merriam's map¹ shows. In the nature of things, this question of the limits of the Transition zone must remain largely a matter of opinion; but while the lower front of the mountains is unquestionably Transition, it seems to me that the austral forms approach the flanks of the range in such force as to entitle most of the country east of Boulder to be regarded as veritable Upper Austral. The females of P. gutierreziae collected at Boulder were found to be much infested by a parasitic fungus, which should be further investigated.

A NEW COTTONY SCALE ON ROSE

In August, 1904, Mr. E. Bethel discovered a cottony scale on twigs of wild rose at Coulter, Middle Park, Colo. The female insects are rather dark brown, 2¼–2½ mm. long, 2⅓–2½ broad, with a conspicuous white ovisac. Microscopical examination shows that the antennæ are eight-jointed, and that the species is in many ways similar to P. amygdali

¹ Bull. 10, Div. of Biological Survey.
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Ckll., which occurs on peach. It is, however, certainly distinct, as the skin of *P. amygdali* is full of large round and oval hyaline spaces, which are not present in the Coulter insect; the latter has numerous small gland orifices, about 5–7 µ in diameter, each containing a small central dot. The antennae also differ; for instance, in *P. amygdali* the second joint is 40 µ or less in length; in the Coulter insect it is 50. There are also differences in the legs. The rose cottony scale has accordingly been described as *Pulvinaria coulteri*.

HYMENOPTERA

NEW RECORDS OF COLORADO BEES

In the genus *Nomada* the males are often so unlike the females that it is difficult to match them. The male described below very nearly became the cause of a synonym, but fortunately the error was detected.

*Nomada (Xanthidium) collinsiana* Ckll.

*δ* Length about 10 mm, some slightly more. In my table of Rocky Mountain species, it runs straight to *N. luteopicta*, but that is a much smaller species, and otherwise different. Head and thorax black, coarsely and as densely punctured as is possible, and clothed with rather long fox-red pubescence, the face, however, not being at all concealed by hair; eyes in life olive-green; head rather broad, the vertex strongly convex, clypeus prominent, facial quadrangle broader than long; clypeus except rather broad upper margin, triangular lateral face-marks (ending in a sharp point some distance below the level of antennæ), a narrow line under eye (not going up the cheeks), basal two-thirds of mandibles, and the rather stout scape in front, all bright lemon-yellow; first joint of labial palpi longer than the other three altogether; flagellum stout, black above and bright ferruginous beneath, the joints oblique and very distinct, not denticulate; labrum yellow; thorax entirely black, except that most of the tubercles, and a small spot on anterior part of pleura (not always present) are yellow; tegulae yellow, with a reddish-hyaline margin and discal spot; wings yellowish, dusky at apex, stigma ferruginous, nervures fuscous; basal nervure going a short distance basad of t. m.; second s. m. higher than broad, receiving the first r. n. about its middle; legs black, yellow, and red; the hind coxae, trochanters, and femora nearly all black, except a broad, dull reddish stripe, ending in a squarish yellow patch, on hind femora in front; hind tibiae and tarsi red, the former with a yellow mark at end; anterior and middle femora yellow and red in front, behind black and red, with a yellow apical mark; anterior and middle tibiae red and yellow, with a black mark behind; abdomen fusiform, dullish with a minutely tessellate surface, very bright lemon-yellow, with the basal half of the first segment (sending a projection backwards in the middle line) and the extreme (mostly overlapped) bases of the other segments, black; broad apical margins of segments 1 to 5 brown-black; apex with some fox-red hairs; apical plate ferruginous with black edges, narrow, and only faintly notched; venter with four extremely broad, entire bright yellow bands, and a yellow apical spot. Third antennal joint very much shorter than fourth.

Var. a. Apical plate of abdomen black, broader, and strongly notched.

*Hab.*—Boulder, Colo., abundant at flowers of *Ribes cereum*, flying along with males of *Andrena leptanthi* V. & C., which it resembles in the pubescence; April 29, 1905 (W. P. and T. D. A. Cockerell). This was taken for a new species, but the day following my wife took a female, which proved to be *N. collinsiana*, hitherto known only in the ♀ sex. The female, when quite fresh, has the same red hair on the head and thorax as the male.
The following new locality-records are interesting for various reasons:

*Spinoliella zebrata* (Cresson). Alamosa, Colo., Aug. 6, 1903 (S. A. Johnson). ♂, ♀. One male was taken "over Spanish peas, in meadow." This species was previously known only from a single female reported vaguely from "Colorado."

*Melanostelis pulchra* (*Stelis pulchra* Crawford, 1902); variety with dark flagellum and tegulae. Boulder, Colo., at flowers of a small vinelike *Astragalus*, June 12, 1905 (W. P. Cockerell). New to Colorado; previously known only from Nebraska.

*Halictus lerouxii* var. *ruborum* Ckll. (new to Colorado), *H. armaticeps* Cresson, and *H. kittei* Rehb., all females, were taken by my wife at flowers of *Berberis repens* at Boulder, April 6, 1905.

*Perdita affinis* Cresson, ♀ (a small specimen), was found on a petal of *Argemone intermedia* at Boulder, June 24. It does not normally visit *Argemone*, and presumably its presence there was accidental.

*Gnathias lepida* (Cresson), ♀, was found May 24, on the campus of the University of Colorado, at flowers of *Drymocallis*. It had been captured on the flower by a grayish Thomisid spider.

*Bom tomeleucta juvilda* (Cresson). Boulder, May 17, 1902 (S. A. Johnson); Virginia Dale, June 19, 1901 (Colorado Exper. Station).

*Melecta miranda* Fox. Denver, June 8, 1901 (S. A. Johnson); Salida, Oct. 8, 1898 (C. P. Gillette); Fort Collins, July 8, 1904, bred from cells of *Anthrophora occidentalis* by S. A. Johnson.


*Dieunomia xerophila* Ckll., ♀. Sterling, at sunflowers (S. A. Johnson). New to Colorado; previously known from New Mexico.

*Prosopis basalis* Smith, ♀. Steamboat Springs, August 6, 1904, on flowers below town along river, altitude 6,700 feet (S. A. Johnson). At the same time and place Mr. Johnson also took *Megachile manifesta* Cresson.

### FLOWERING PLANTS

#### NEW MEXICO WEEDS

Few persons who have not paid especial attention to the matter realize the extent to which our flora is invaded by aliens. This is especially the case, of course, in towns and cultivated fields; and is best appreciated when one comes to examine land which has been disturbed and yet not occupied by any crop. At Las Vegas, N. M., the campus of the Normal School was thoroughly gone over, the surface being plowed and scraped, and altered to make suitable levels and slopes, so that no sign of the original rather scanty vegetation remained. During the last week of September, 1902, finding that the fallow ground had produced a new and rather varied flora, I collected everything growing there, finding the following species:

1. **Aliens from Europe:** *Melilotus alba*, *Salsola tragus*, *Chenopodium album viride*, *Plantago major*, *Malva rotundifolia*, *Polygonum rayi*, *P. persicaria*, *Chatochloa viridis*, *Hibiscus trionum*=9 species.

2. **Aliens from the South and Tropics:** *Ipomoea hederacea*, *Panicum colonum*, *Amaranthus graecizans*=3 species.
(3) Aliens escaped from cultivation: Medicago sativa, Pisum sativum, Zea mays
Avena sativa, Hordeum vulgare, Citrullus citrullus=6 species.

(4) Natives of New Mexico: Solanum elaeagnifolium, S. rostratum, S. triflorum,
Chamaesaracha coronopus, Gärteria tenuifolia, Iva xanthijolia, Xanthium commune,
X. commune wootoni, Verbesina exauriculata, Grindelia inornata, Helianthus annuus,
Cosmos parvis florae, Dysodia papposa, Bahia oppositifolia, Salvia lanceolata, Bouteloua
spp., Amaranthus chlorostachys, Verbena bracteosa brevibracteata, Malvastrum cockerelli,
Gaura cocinea, Sphæraæa cuspidata, S. fendleri lobata, Crassula grandiflora, Gutierrezia
sarothrae, Leptilon canadense, Eriocarpum spinulosum, Teucrium laciniatum, Ratibida
spp., Stipa vaseyi=29 species. Some of these, like the Xanthium and the
Leptilon, may be aliens to the immediate region, which have established themselves so firmly that
they cannot be distinguished from natives.

It would probably be worth while for botanists more frequently to put such facts as
the above on record; for, although they appear insignificant taken singly, they would, if
sufficiently numerous, afford valuable historical materials at a later date. Already it has
become in some instances difficult to distinguish aliens from natives, because we lack
information concerning past conditions. A list of the weeds growing under such conditions
as the above in Las Vegas fifty years ago would be decidedly interesting; and fifty years
hence it will be no less interesting to compare the weed-flora of the locality with that now
recorded.

For an interesting discussion of plants growing on denuded areas, see Wallace's

THE FLORA OF WARD, COLORADO

We are accustomed to think of the flora of our higher mountains as being entirely
of a boreal type, but a careful analysis of the genera represented shows that this is not
actually the case. In the Andes the fauna and flora of high elevations appear to have
been derived from the surrounding lower lands, whereas in the Rocky Mountains the
circumpolar elements are so conspicuous that we are apt to forget the existence of any
others. It is nevertheless a fact that southern and peculiarly American types do invade
the mountain heights, one conspicuous genus, Rydbergia, being even characteristic of the
Arctic-Alpine zone, though its allies are found in the species of Hymenoxys, a genus
extending even to South America, and not known in the Old World.

When recently at Ward (alt. about 9,000 feet), I made a list of all the genera of flower­
ing plants, exclusive of grasses and sedges, that I saw. It is not to be supposed that the
list is complete for that locality, but it is sufficiently so to be highly characteristic. Ward
is in the upper part of the Canadian zone, and yet an analysis of the flora gives the following
results:

(1) Boreal or Circumpolar genera: Aquilegia (A. caerulea), Fragaria, Ribes, Dasi­
phora (D. fruticosa), Campanula (C. rotundifolia), Epilobium, Chamaenerion, Nuphar
(N. polysepalum), Rumex (R. salicifolius), Polygonum, Achillea, Pinus, Chenopodium,
Artemisia, Senecio, Geranium (G. fremontii), Carduus, Arctostaphylos (A. uva-ursi), Rosa
(R. sayi), Juniperus, Salix, Artemisia, Sambucus, Populus (P. tremuloides) Ranunculus,
Bursa (B. bursa-pastoris, no doubt introduced), Urtica, Potentilla, Taraxacum (T. taraxa­
cum), Trifolium (T. pratense and repens, introduced), Galium, Anemone, Pulsatilla,

* Cf. Bates in the Appendix to Whymper's work on his travels among the Andes of Ecuador.
Scrophularia, Rubus (R. stigosus), Aragallus, Allium, Erigeron, Prunus, Astragalus, 
Acer (A. glabrum), Picea, Vaccinium, Arenaria, Betula, Arabis, Saxifraga, Draba, Mer-
tenia, Gentiana, Solidago, Erysimum (E. alpestre), Thermopsis (extends to Asia, but not 
to Europe), Sedum (S. stenopetalum), Lupinus (not typically boreal), Halerpestes (extends 
to Asia and S. America), Claytonia (mainly American), Capnoides, Androsace, Polygonum 
§ Bistorta, Elephantella (E. groenlandica), Pedicularis (P. grayi)=60 genera.

(2) American genera, nearly all, at least, austral types: Calochortus (C. gunnisoni 
immaculatus; Pacific Region genus), Grindelia (extends to Peru and Chile), Gaillardia 
(G. aristata; genus extends to South America), Gayophytum (G. ramosissimum; genus 
extends to South America), Castilleja (Western and Southwestern), Rudbeckia (extends 
to Mexico), Gilia (G. pinnatifida), Penstemon, Frasera (Western), Ericogonum, Chrysopsis, 
Phacelia (P. cincta), Phacelia § Eutoca (P. sericea), Symphoricarpos, Edgewisia, Drymo-
callis, Ceanothus (C. leucoglossus), Zygadenus (but genus has one species in Siberia), Agoseris 
(A. aurantiaca; genus extends to South America), Dodecatheon (but extends to Asia; 
perhaps should be treated as boreal), Machaeranthera, Oreocarya, Thelypodium, Distegia= 
23 genera.

Distegia, Raf., has been considered part of Lonicera, but it is a characteristic endemic 
American type, apparently of generic value. It consists of the following forms: D. 
involucrata (Lonicera involucrata Banks), D. involucrata serotina (L. involucrata v. 
serotina Koehne), D. involucrata humilis (L. involucrata humilis Koehne), D. flavescens 
(L. flavescens Dippel), and D. ledebourii (L. ledebourii Esch.). The range is from New 
Mexico to Alaska, east to Quebec and west to California.

The few day-flying Lepidoptera noticed at Ward were all of boreal types; namely, 
Colias (C. eurytheme, C. alexandra, C. alexandra var. alba), Pyrameis (P. cardui, an almost 
cosmopolitan species), Chrysophasus, Lycaena, Pieris, and Autographa.

Two small ichneumon-flies collected at Ward were sent to Dr. W. H. Ashmead, who 
will describe them as new species of the genera Bathynictis and Catastenus.

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1 The recently published Sedum subalpinum Blankinship, is probably identical with S. stenopetalum 
rubrolineatum Ckll., 1891. It is hardly to be considered a distinct species, I think; and I learn from Dr. 
Britton that he also doubts its validity.