NOTES ON THE COCCINELLIDÆ.

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In his recent essays on this family of beetles, Mr. Chas. W. Leng (Journ. N. Y. Ent. Soc.) has given results betraying some superficiality of study and lack of sound discriminative judgment. He seems to have pursued the eminently conservative course of assigning all species which are in any way remindful of others to rank as varieties of the latter, incidentally giving them three names, and frequently in a wholly arbitrary and whimsical manner. If he had examined these so-called varieties at all carefully, he would have been spared the responsibility for many needless errors.* The course followed by Mr. Leng and myself are at opposite taxonomic extremes. I tabulated virtually all the forms as species, because my material was not sufficient to warrant giving them a more definitive status, and not because I was not convinced that some of them might ultimately be proved to have less than specific weight. Mr. Leng, on the other hand, with material not so very greatly in excess of my own, has assumed to know that the true taxonomic position of practically every form which I defined is that of a variety or subspecies. He has apparently tried to imitate the European Catalogue in reducing most of the described forms of that region to varieties or aberrations, but if he were familar with them, he would see that many differ only by the absence of a spot here or a dash there, and that a large proportion of them are really synonyms. The latest European catalogue has, however, gone too far in its reductions from the specific status; the reverse swing of the pendulum is too radical, and there will be a gradually decreasing oscillation to a more rational intermediate position. I have endeavoured to define our various modifications broadly, on lines of general form, size, sculpture, structure or radical divergencies in the colour scheme, and feel certain that most of them are true species. The truth lies between the

*If Mr. Leng had taken the very slight trouble to communicate with me regarding the status of *Exochomus subrotundus* and other points, a good deal of uncertainty could have been cleared up. I would gladly have aided him through special observations, or have given him cordial welcome to personal study of my collections, and this despite a baseless rumor which, I am reliably informed, is being circulated with more or less pertinacity by a Washington entomologist of some repute, to the effect that my collections are inaccessible—a statement smacking strongly of malice aforethought. I might add, however, that one who is actively favouring a departure from customary methods of doing anything whatever may have a few friends or passive onlookers, but a far greater number of irreconcilable doubters, with a modicum of more or less virulent enemies, so that he generally comes to draw the line of personal favour somewhere, even in matters scientific, as we are all human after all.

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course pursued by me and that suggested by Mr. Leng, but, for the above reasons, I anticipate the ultimate decision will be far nearer the former than the latter.

It is probably true that the various forms defined in the genus *Megilla* have rather less than full specific value, but the Brownsville modification is so much larger that it may possibly prove to have very nearly specific weight. Another form, from Cuba, in my collection, has the two thoracic spots completely united, but I do not know how constantly.* Mr. Leng is, however, wrong in uniting *Macronæmia* with *Anisosticta;* it is a valid genus, and so recognized by Dr. Weise, who, however, arbitrarily changed the name to *Micronæmia*, a useless proceeding, as *Macronæmia* is amply protected by the laws of priority. *Paranæmia similis* is very readily distinguishable from the Californian *vittigera*, and is not a mere hypothetical race; it is certainly, at least, a valid subspecies.

Hippodamia, Chev.

I assumed the authorship of Chevrolat for this genus, and not Mulsant, as this seems to be the course adopted by the latter himself in the Monograph (1866). Owing to the large number of recognizable forms and the variability of markings, unusually pronounced for the Coccinellidæ, where ornamentation is frequently so free from marked instability, there will probably always be more or less divergence of opinion regarding specific limitation. The *5-signata—convergens* group, much the largest of the genus in America, includes many species of indubitable reality, a far greater number, in fact, than the half-dozen recognized by Mr. Leng.

This *5-signata—convergens* series embraces two not very strongly-differentiated groups, one in which there is a transverse subbasal elytral fascia, sometimes more or less permanently disintegrated into spots or wholly wanting, and attended by a general absence or very great reduction or instability of the diverging discal lines of the pronotum, represented by the former, and the other in which the subbasal spots are either wanting or generally isolated, and accompanied by a very pronounced

*M. *Cubensis*, n. subsp.—Smaller and rather less opaque than *fuscilabris*, red, the head black, with the usual acutely angulate frontal spot; pronotum solidly black, the apical and lateral margins alone pale, though broadly; elytra with the usual spots of *fuscilabris*, except that the sutural post-medial is resolved into two spots, each tangent to the suture. Length, 5.0 mm.; width, 2.8 mm. Cuba (Havana).

The form which I described under the name *medialis* seems to be that figured by Gorham in the Biologia (VII, Pl. 8, fig. 20).

development and persistence of the diverging thoracic lines, represented by *convergens*.

The *5-signata* group comprises by far the greater number of species. *Mœsta*, Lec., has a very uncertain taxonomic status but is evidently a member of the *5-signata* series; we have as yet no biological evidence concerning its relationships. *Ambigua*, Lec., of broadly oval form and constant absence of elytral maculation, is one of the most isolated species of the entire genus and without any close affinities. *Extensa*, Muls., though a member of this series, differs from the common forms of the *5-signata* or *LeContei* types in its very finely-reflexed elytral side margins, and it is undoubtedly a distinct species, probably having as a subspecies *leporina*, Muls. Mulsant (Mon., 1866) states of *leporina* that it is elongate-oval, slightly convex, with a black pronotum, having at each side a white border almost interrupted at the middle, the elytra with a subbasal band from callus to callus, and each with two black spots, the anterior somewhat in transverse triangle, the subapical smaller, obtriangular and united with the preceding; dimensions, 5.6 x 4.2 mm. California. So it cannot be considered in any way related to *vernix*, as stated by Leng. *Oregonensis*, Cr., is described as having a subbasal elytral band, with the posterior spots united to form a lunule, and the white thoracic side margin narrow; it is therefore probably a distinct species in this immediate neighbourhood, or, if not, may be a subspecies of *extensa*.

The species described by Kirby as *5 signata*, is essentially a boreal form, and may be known by the generally broad, solid and even bioblique subbasal band of the elytra, with a thick and obliquely transverse postmedian and full rounded subapical spot on each. The white lateral thoracic margin is confined to the apical angles; this oblique white area may sometimes be visible also at the basal angles, though I assume very rarely, and those examples with the pale area running down the sides, cited by Crotch, belong without much doubt to another species, mentioned below, and accidentally mingled with his true *5-signata*. The following is a more southern subspecies of *5-signata*:

H. coccinea, n. subsp.—More narrowly oval and smaller than *5-signata*, similarly moderately shining, closely and rather coarsely punctate; head black, with a large and irregularly rhomboidal pale spot; pronotum solidly black, without discal pale spots, the black area broadly bilobed in front, the lobes tangent to the apical margin, the sides obliquely pale in front, not at all pale posteriorly; elytra with a broad subbasal

fascia, which is sometimes even, but often irregular, its arms less anteriorly oblique than in *5-signata*, sometimes with a small post-humeral spot also, the oblique post-median spot thinner and the subapical smaller, sometimes subobsolete; ground colour bright scarlet. Length, 5.4–5.6 mm.; width, 3.3–3.7 mm. Colorado (Eldora and Boulder Co.).

In *LeContei*, of which I have specimens from the type locality, New Mexico, the head always has a rhomboidal central pale spot as in *5-signata*, but the thoracic margins are broadly white at apex and base, though broadly subinterrupted at the middle by an abrupt spur from the central black area. There is less generally a subbasal fascia, and, when it occurs, it is more bilaterally attenuated. An allied form before me from Utah to Washington State, but probably specifically distinct and evidently a form frequently confounded with *LeContei*, may be distinguished readily by the broad entire white band on the head, from one eye to the other; this is constant in all my specimens. *Mulsanti*, of LeConte, from Lake Superior, the type locality, to Colorado, is a more northern form, with heavier subbasal marks, which frequently form a fascia, and this is no doubt the form frequently confounded with *5-signata*, as intimated above. The following might be regarded as another subspecies of *LeContei*:

H. abducens, n. subsp.—Much larger than *LeContei*, almost similarly marked, except that all black marks on the elytra before the middle are frequently obliterated; pronotum similar, except that the less angulate black area never completely divides the white margin, the diverging lines occasionally evident, but generally obsolete; surface slightly alutaceous, the punctures very fine; elytra before the two large posterior spots either devoid of all marking, even to the virtual obliteration of the sutural dash, or with a crescentiform fascia between the humeri, with but few intermediate stages of ornamentation, the post-humeral spot always completely obsolete; sixth ventral of the male without apical pit, even and entire. Length, 5.8–7.0 mm.; width, 3.7–4.3 mm. Colorado (Boulder Co.).

The general habitus of that form of *abducens* with obliterated antemedian marks, strongly recalls the eastern *glacialis*, but it may be distinguished readily by its narrower form and feebly developed or obsolete diverging thoracic lines, besides differences in sculpture.

Vernix is a much smaller and narrower form, specifically different from *LeContei* in having the very large rhomboidal frontal pale spot more or less narrowly extending to the sides of the head and enveloping the anterior parts of the eyes; *subsimilis* may be held to be a subspecies.

Another form in my cabinet, departing radically from *LeContei* in having the pronotal side margins narrowly and subequally pale from apex to base, may be described as follows :

H. Uteana, n. sp.—Smaller than *LeContei* and bright scarlet, with isolated large subhumeral spot and trilobed scutellar star, similar in general form, more shining, the punctures distinct and rather sparser ; head with rhomboidal isolated pale spot ; pronotum solidly black, without trace of discal spots, the lateral spur of the black area very obtuse, so that the unusually narrow lateral pale margin is subparallel, not much wider at any point than the entire apical pale margin, and never divided ; apex of the met-episternum pale, as well as the epimeron ; elytra with oblique post-median fascia and subapical circular spot. Length, 5.0–5.6 mm.: width, 3.25–3.4 mm. Utah (Sevier Lake, Marysvale and Nephi), Wickham.

Finally, we have a group of small species, in no way closely related to any others of the *5-signata* group. *Dispar* is recognized as sufficiently distinct to require no further notice. *Puncticollis* is an equally isolated species, readily identifiable by its small size, narrowly oval outline, narrow and uninterrupted pale thoracic side margin, complete absence of discal diverging lines, strong and close pronotal punctures and the peculiarly irregular post-median spot of the elytra. The following is a very distinct form related to *puncticollis :*

H. liliputana, n. sp.—Very small, narrow and parallel in form, the head with rhomboidal central spot as in *puncticollis*, but more slender, the pronotum much more sparsely punctate but otherwise nearly similar, except that there are two small basal impressions, at lateral fourth ; elytra pale brownish-yellow, the margins more finely reflexed than in *puncticollis*, the broad entire bioblique basal fascia similar, with its outer ends truncate, the spot just behind the middle large, rounded, with an external posteriorly oblique spur, the subapical spot large, transversely oval; surface more shining, more coarsely and less closely punctate than in *puncticollis*. Length, 4.0 mm.; width, 2.2 mm. Colorado.

Most of the forms mentioned are, I think, true species; at least, there is no apparent reason for giving them less weight ; they have distinctive and readily observable characters, seem to breed true within more or less wide, though perfectly definite, limits of variation and satisfy all the usual definitions of species. It is too much to expect radical divergencies in colour pattern, for the general scheme of ornamentation in the Coccinellidæ is more of a generic than a specific character.

The species of the *convergens* group are fewer in number, those described thus far being *glacialis*, *convergens*, *15-maculata*, *obliqua*, *juncta* and *politissima*. In a very large series of *convergens* before me collected in many places from the Atlantic to the Pacific and as far south as Puebla, in Mexico, there is not a single example in which the slightest tendency to amalgamation of the post-scutellar spots to form a single star, or of the confluence of the post-median spots, either transversely or longitudinally, can be discovered. There may be such phenomena in nature, but I can only say that I have failed to observe them, and strongly suspect that those instances in which they have been announced, as in the unnamed form listed by Leng, refer to some other species, for it is only after much experience that the commingling of different species, so similar in their markings, can be avoided. The subbasal spots are sometimes obsolete, and occasionally all the spots, except the small scutellar dash, are wanting, but I have only observed this in a few Puebla specimens. The species described by Mulsant under the name *15-maculata* is much larger than *convergens*, and is abundantly isolated and perfectly valid, by no means a variety as surmised by Leng. I have a good series taken near St. Louis. *Juncta* is a very remarkable form, with a juxta-sutural vitta uniting the transversely confluent post-median spots with the subapical; it is apparently a species, but, if the future should decide otherwise, it will prove to be a subspecies of *obliqua* and not of *convergens*. *Obliqua* is a species quite distinct from *convergens;* it is smaller, still narrower and has several radical peculiarities of marking. As for *politissima*, it may for the present be disposed of as a subspecies of *obliqua*, of slightly shorter, stouter form, more obsolete punctuation and more polished surface. *Obsoleta*, proposed by Crotch as a variety of *convergens*, is to be completely suppressed as a manuscript name, for no description was given, the only statement made being "punctuation of elytra entirely obsolete," and this is erroneous, as no example of *Hippodamia* ever had the punctures entirely obsolete.

The *sinuata* section of the genus is composed of smaller and narrower species, on the whole, than those of the preceding, differing radically in the complete and constant absence of the two post-scutellar points, and in exhibiting a marked tendency to the longitudinal amalgamation of the discal spots to form vittæ from the humeral callus, there never being any tendency to posterior elongation of the subhumeral spot in the *5-signata—convergens* series. There are four known species, *spuria*, *Crotchi*, *sinuata*

and *trivittata*. *Spuria*, Lec., is distinguished by the more gradually narrowed elytra behind the middle, or more elongate-oval form, as mentioned by LeConte. In the typical form, from Oregon and Washington State, the spot on the callus is always isolated and rounded, though the three posterior spots may be joined together to form a design resembling that of *parenthesis*, and the scutellar dash is always short, terminating abruptly near basal fourth, though frequently notably expanded at tip; *Americana*, of Crotch, is a subspecies occurring in New Mexico, having a greatly extended scutellar spot and the subhumeral and median spots frequently united, and, from Washington State and Utah, I have an intermediate form with scutellar spot extending about to the middle or a little beyond. In *Crotchi* the body is more oblong, the elytra more rapidly narrowed and rounded apically, and, in typical forms, the subhumeral spot is always joined to the medial by a subparallel black vitta; the scutellar spot attains basal third and is always more or less broadly rhomboidal, the conformation being as in the subspecies *complex*, of *spuria*. The side margins of the elytra are extremely finely reflexed, and not with a distinct gutter as in *spuria* and its variations. In *sinuata* there is a discal vitta on each elytron, which is almost semicircularly curved apically, and in *trivittata*, which is a much smaller species, the vitta is almost straight throughout, becoming but feebly oblique apically. *Falcigera*, of Crotch, because of the black met-episterna and lack of discal thoracic spots, always so well developed in *sinuata* and allied species, must be considered as a section by itself. I am disposed to hold that the coarse-print paragraph under *Americana*, in Crotch's paper, was really misplaced by the printer in making up the page, and should have followed the preceding *falcigera*, because the met-epimera in *Americana* are undoubtedly pale, as in the other species.

Finally, in regard to the *parenthesis* section, there can be little or no reasonable doubt that *parenthesis* and *apicalis* are distinct species. In the former there is never any tendency in the circular spot on the callus to prolong itself posteriorly, and the subapical spot never attains the sutural angle, while in the latter there is a marked tendency in the subhumeral spot to posterior elongation, and the subapical always attains the sutural angle. I have never seen an exception to these laws in large series, even where the eastern and western species come together on common territory in Colorado, and have never seen anything that appeared to be a hybrid, although hybrids between distinct species frequently do occur, so that this would not be conclusive evidence. As for the exceptional form figured by Leng, having the humeral spot connected with the

post-median, the latter not attaining the sutural angle, I can only say that if the short, broad form of the body and the peculiar form of the anterior margin of the prothorax are truly drawn, it is entitled to a distinctive name, either as a species or a very peculiar subspecies of *parenthesis*. The following is also an interesting subspecies of *parenthesis* :

H. expurgata, n. subsp.—Shorter, rather smaller and relatively broader than *parenthesis*, highly polished, with distinct moderate punctures, pale brownish-flavate; prothorax shorter and more transverse, nearly similar in maculation ; elytra with a scutellar dash, rapidly expanded at its tip and a rounded subhumeral spot, the remainder of the elytra without spots or with a small post-median spot, and sometimes a still smaller subapical one. Length, 4.0 mm.; width, 2.6 mm. Colorado (Boulder Co.).

Mr. Leng has also figured this form having a small posterior dot.

This *parenthesis* group has a distinct suggestion of the two post-scutellar points of the *5-signata* group, combined with the vitta-forming tendency of the *sinuata* group and a system of pronotal maculation peculiar to itself.

List of American Hippodamia.

A

1. 13-punctata, Linn. — Holarctic
   tibialis, Say.

B

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2. mœsta, Lec.—Pac. coast.
3. ambigua, Lec.—Calif.
   punctulata, Lec.
4. extensa, Muls.—Calif.
   ssp. leporina, Muls.—Calif.
5. oregonensis, Cr.—Oregon.
6. 5-signata, Kirby.—B. Am.
   ssp. coccinea, Csy.—Col.
7. Uteana, Csy.—Utah.
8. LeContei, Muls.—New Mex.
   ssp. Mulsanti, Lec.—L. Sup. to Col.
   ssp. abducens, Csy.—Col.
9. vernix, Csy.—Wy.
   ssp. subsimilis, Csy.—Col.
10. puncticollis, Csy.—Can. R. Mts.
11. liliputana, Csy.—Col.
12. dispar, Csy.—Col.

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13. glacialis. Fabr.—East. N. Am.
14. convergens, Guer.—Atl., Pac. and Mex.
    obsoleta. Lec., i. litt.
15. obliqua, Csy.—Calif.
    ssp. politissima, Csy.—Cal.
16. juncta, Csy.—Calif.
17. 15-maculata, Muls.—Ill., Mo.

C

18. spuria, Lec.—Or., Wash., Ut.
    ssp. Americana, Cr.—N. Mex.
    ssp. complex, Csy.—Wash., B. Col.
19. Crotchi, Csy.—Calif.
20. sinuata, Muls.—Calif.
    interrogans, Muls.
21. trivittata, Csy.—Calif.

D

22. falcigera, Cr.—B. Am.

E

23. parenthesis, Say.—Atl. to Col., Wy., Wash.
    tridens, Kirby.
    lunatomaculata, Mots.
    ssp. expurgata, Csy.—Col.
24. apicalis, Csy.—Col. to Calif.

Adalia, Muls.

In my opinion *ophthalmica*, *ovipennis*, *annectans* and *transversalis* are valid species; *ornatella* might be regarded as a subspecies of *transversalis*, but no other close alliance can be discerned. The coarse and very conspicuous punctures of the latter, as well as *ornatella*, distinguish them at once from *annectans*, without noting peculiarites of ornamentation. I do not think that we have the true *Arctica*. The following is an interesting addition:

A. coloradensis, n. sp.—Form rather more narrowly oval than in *annectans*, convex, highly polished, finely and moderately punctate, pale brownish-red; head black, with a pale spot next each eye; pronotum solidly black, without trace of median basal pale spots, the very fine apical pale margin sometimes obliterated, the sides broadly pale, without black spot, being like those of *bipunctata*, except that the oblique sides of the black area are irregular, having a feeble oblique sinus at the middle; elytra wholly pale, excepting a feebly oblique transverse spot at middle, half as far from suture as side margin, and a transversely duplex subapical spot on each. Length, 3.9–4.6 mm.; width, 2.75–3.3 mm. Colorado (Boulder Co.).

Represented by three specimens holding together very well; in one of them there is an obtuse lateral spur from the black pronotal area just behind the middle, but it is of a piceous colour, adventitious and not properly homologous with the spur in *annectans* and allied forms.

Coccinella, Linn.

In this genus Mr. Leng has succeeded in augmenting the confusion and uncertainty, rather than contributing anything to the sum of human knowledge. A very cursory comparison, especially as to thoracic ornamentation, of the American examples referred by Crotch to *trifasciata* and typical native examples of the latter, would have shown him that specific identity is out of the question, and that the name *perplexa*, Muls., that I employed, and which he so unceremoniously rejects, is the only proper one to give the American species. Furthermore, there was no need to go back to the formerly assumed equality of *transversoguttata* and *5-notata*. A Siberian example of the former before me shows that the latter is a different species, larger, more convex and more elongate-oval, as well as somewhat differently marked, and *suturalis*, which he transforms into a variety, though sufficiently remarkable to bear the burden of italics, is in no way closely related to any other species, being

one of the most depressed and compact species known at present and evidently valid.

The genus as restricted in my Revision may be divided into two primary sections, the first having the black thoracic area extending broadly to the anterior edge, the second having the black area separated therefrom by a more or less broad complete pale border. The first section comprises most of the large species with tendency to transverse fasciation of the elytral markings. The second is divisible into three minor groups, represented by *9-notata, perplexa* and *tricuspis*. In the first section there are several primary type forms, represented by *5-notata, monticola* and *Californica* respectively. To the *5-notata* group belong in addition only *nugatoria, Johnsoni* and *Sonorica*. The *monticola* group includes as species *monticola*, with *impressa*, differing in sculpture but probably a subspecies, the distinctly isolated *suturalis, alutacea*, much larger, more convex and with a much more pronounced posterior prolongation of the lateral thoracic white area, *prolongata*, with very irregular white lateral area, which, by a transverse spur, tends to form a partial apical white margin bordering the black area, and *difficilis*.

The *Californica* group includes besides only *Nevadica*, agreeing in the total absence of discal spots on the elytra but differing in its more broadly oval form, pale and not blackish sutural edges, and, more particularly, in its much coarser, denser and more conspicuous punctuation.

The first group of the second section includes *9-notata, degener* and *Oregona*, the last two of which may be regarded as subspecies. The second group is composed of *perplexa, subversa*, with subspecies *Juliana*, of which *barda* is a synonym, and *Eugenii*, the latter a valid species. The third group consists of the remarkably isolated *tricuspis* alone.

The following are the new species or subspecies mentioned above:

C. Sonorica, n. sp.—Large, broadly oval, very convex, rather shining, finely and inconspicuously punctate; head with the usual juxta-ocular spots; pronotum with a moderate quadrate spot at each angle, extending posteriorly only to the middle, the black, however, ascending along the edge almost to the angle, the entire hypomera black except at tip; elytra with a large transversely biangular scutellar spot, a thick transverse spot on each at the middle, from inner fourth to outer third, without trace of additional external spot, and a subapical similar spot from inner third to outer sixth. Length, 6.2–7.0 mm.; width, 4.8–5.4 mm. Mexico (Colonia Garcia, Chihuahua), Townsend.

C. Johnsoni, n. sp.—Not very broadly oval, very convex, polished, extremely minutely punctulate; head with the usual two large pale spots; pronotum with a quadrate spot at the angles, with the lateral border black for some distance anteriorly, the hypomera pale only at apex, the pale area extending posteriorly near the edge to apical two-fifths; elytra with the sutural edges finely blackish, a moderate rhomboidal scutellar spot, and each with a circular subhumeral, a medial from inner fourth to the median line, a very small submarginal at a third from the base and two subapical spots, the outer of which is much the smaller but detached. Length, 6.0 mm; width, 4.7 mm. California (San Diego).

This form, which I originally considered a spotted modification of *Californica*, but which in reality is a very well-marked species of the *5-notata* series, is dedicated with pleasure to Mr. Roswell H. Johnson, who is now engaged upon a general biological study of colour variations in the Coccinellidæ.

C. Oregona, n. subsp.—Large in size, distinctly elongate-oval, yellowish, polished, finely punctate; head pale, the apical and basal margins evenly, transversely black; pronotum with a large quadrate anterior spot at each side, the two united along the apical margin, the hypomera pale in apical three-fifths; elytra with the sutural edges finely blackish, a small subrhombiform scutellar dash, and each with the usual spots of *9-notata*, though much reduced in size, especially the subhumeral, which is almost obsolete. Length, 6.4 mm.; width, 4.9 mm. Oregon (southern).

I have a good series of *difficilis* from Utah, collected by Wickham, and its broadly rounded, subhemispherical form and markings evidently ally it to the *monticola* group, in the vicinity of *alutacea*, and not, as indicated by Crotch, to *perplexa* (=*trifasciata*, Cr., nec L.). I have also received the true *nugatoria*, from Santiago, Mexico, since my last revision of the genus, and find that the subhumeral spot is well formed and circular, the post-humeral also distinct and the scutellar blotch transversely oval, indicating that it does not coalesce with the subhumeral, and the elytral punctures are so nearly obsolete that they are only to be discerned with difficulty. In *5-notata* the subbasal fascia is seldom resolved into three spots, and then in such ragged fashion as to show at once that they have been derived by disintegration, and the elytral punctures are very distinct. I think, therefore, that *nugatoria* ought to have the status of a species.

List of Coccinella.

A

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1. 5-notata, Kirby.—Mont, Ut., N. Mex.
2. nugatoria; Muls.—Mex.
   transversalis, || Muls.
3. Johnsoni, Csy.—Calif.
4. Sonorica, Csy.—Mex.
5. monticola, Muls.—L. Sup. to Vanc.
   lacustris, Lec.
   ssp. impressa, Csy.—Calif.
6. suturalis, Csy., Calif.
7. alutacea, Csy.—Col., N. Mex.
8. difficilis, Cr.—Utah.
9. prolongata, Cr.—Col., Ut.
   monticola, Lec., nec Muls.

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10. Californica, Mann.—Calif.
    franciscana, Muls.
11. Nevadica, Csy.—Nev.

B

*

12. 9-notata, Hbst.—Atl. to Col.
    ssp. degener, Csy.—Col., N. M., Ariz.
    ssp. Oregona, Csy.—Oregon.

**

13. perplexa, Muls.—R. I., Mich., Wis.
    trifasciata, Cr., nec L.
14. subversa, Lec.—Oreg.
    ssp. Juliana, Muls.—Calif.
    barda, Lec.
15. Eugenii, Muls.—Calif.

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16. tricuspis, Kirby.—Br. Am., L. Sup.

An examination of the Mexican species placed by Gorham in *Coccinella*, shows too great diversity for a single genus, and in fact the true *Coccinella*, as represented by the type, *7-punctata*, Linn., does not seem to be at all well represented in Mexico. For such species as *lutei-pennis*, *ampla*, *cyathigera* and *albopicta*, I would propose the generic name *Harmoniaspis* (n. gen.), and for *compta*, *concinna* and *pantherina*, with much shorter antennæ, the name *Harmoniella* (n. gen.). In imposing the name *Harmonia*, the type of which may be assumed to be the Brazilian *Sommieri*, upon such an inharmonious assemblage of species, it is assumable that Mulsant merely desired to indulge to a slight extent in entomological "plaisanterie." The name has since been used three or four times in other classes and orders of animals.

Cycloneda, Cr.

The species named "*ater*" in my Revision was first placed in *Exochomus*, where the name was given it, but afterwards transferred to *Cycloneda*, the name being inadvertently printed as at first applied. It is to be hoped that this explanation will be acceptable to Dr. Weise, who

kindly pointed out the error. The name of the species should be *atra*, and not "*ater*." It is a very peculiar species, only doubtfully a member of *Cycloneda*, but may remain there for the present. Although rejected by Leng, because of doubt concerning its geographic habitat, there can be but little question that it belongs to the fauna of this country, as there was but little or no foreign material in the Levette cabinet, whence it came. The error in the name "*ater*," just referred to, which, by the way, was not discovered by Mr. Leng, reminds me of a still more flagrant lapsus on p. 141 of my Revision, where I have imposed a name "*postpinctus*" upon a harmless Scymnid; it should of course be *postpictus*. And this leads me to notice a new high Latin rendition of the word fourteen, which Mr. Leng (Jr. N. Y. Ent. Soc, 1903, p. 206) informs us should be "*quatrodecim*," in striving to write the name *quatuordecimguttata*.

The true *Cycloneda* has as its type *sanguinea*, Linn. Such forms as *Gilardini*, Muls., from Colombia and Central America, form a distinct genus which may take the name *Spiloneda* (n. gen.).

Olla, Csy.

In Mexico there are several species of *Olla* still unnamed; one of these, from Vera Cruz, differing very radically from *abdominalis*, was outlined as a variety of the latter by Mr. Gorham (Biol. VII, p. 172, pl. 9, fig. 24). It differs in having two large elongate-oval subbasal and two large divaricately oblique elongate-oval median spots on each elytron. It may take the name *Olla Gorhami* (n. sp.). Besides *V-nigrum* and *Sallei*, the genus may also include, among the Mexican species, such forms as *Coccinella maculosa* and *quichensis*, although it is impossible to definitely decide this without actual observation.

The name *oculata*, Fabr., for the black forms in this genus, is, I think, clearly untenable. The statement that there is a rounded pale spot at each side of the pronotum in *oculata*, would seem to set the matter at rest, and the Fabrician *oculata* must apply to some species in another genus, probably *Cœlophora*, with the assumption that the locality given by Fabricius for *oculata* is erroneous; this is a much more legitimate conclusion than to assume the description to be erroneous, as suggested by Leng. The slender irregular pale area along the sides of the pronotum in these black forms of *Olla* could never, by any stretch of the imagination, be considered rounded, whereas the rounded form is very common in *Cœlophora*. It may be said, also, that casual observation of the series of these black forms in my collection must convince any

systematist that there are a number of distinct species, differing conspicuously in form and size of the body, as well as in the form and, to some extent, the position of the elytral pale spots. This would seem to militate against considering them a melanic modification of *abdominalis;* but this question appears to be no nearer a solution now than in former times. It would be one of the most interesting problems for the experimental biologists to solve. The following is allied to *abdominalis:*

O. minuta, n. sp.—Form as in *abdominalis*, almost impunctate; head pale, with a biangulate basal black area; pronotum with broad lateral and apical pale margins, the black area almost solid, having merely two very small, nubilous and elongate discal points; it is broadly bilobed anteriorly, and has at each side a post-median spur; elytra with the scutellum and sutural edges finely blackish, each with four subbasal spots as in *abdominalis*, though relatively larger, and three much larger median spots, the outer two elongate, extending to apical fourth, the subapical large, only narrowly isolated. Length, 3.2 mm.; width, 2.7 mm. Texas (Brownsville), Wickham.

Differs in its very much smaller size, still more highly polished surface and development of the markings, which are, however, of the same order as in *abdominalis.*

Pseudocleis, n. gen.

An examination of the figure of *Cleis lynx*, given by Gorham in the Biologia, indicates that our *Harmonia picta* cannot be associated with it, and should have a distinctive generic name. I would propose the name *Pseudocleis*, with *picta* as the type.

The species described by me as *Hudsonica* is perfectly valid, and not a variety of *picta*, as stated by Leng; *minor* is, however, properly a subspecies, and there are two other forms in my cabinet that might with some propriety receive varietal designations. It is almost superfluous to add, to anyone who has actually made careful comparative observations; that our *Anisocalvia cardisce* and *Victoriana* can in no wise be considered as closely allied to the European *14-guttata.* It may be barely possible that we have been misinterpreting the *12-maculata* of Gebler; at any rate, I am unable to verify the name by plain count of the spots; there are eleven on the elytra and two on the pronotum.

Anatis, Muls.

The species which I described under the name *LeContei* is so distinct from *Rathvoni*, Lec., in every feature, that it could under no circumstances

be confounded with it, except by pure perversity. This error on the part of Mr. Leng, which is the most unaccountable that I can recall having seen in print, and, I understand, not typographic, as I had at first supposed, naturally engenders a suspicion that this author must needs have a very inconstant and peculiar personal equation in regard to reliability.

Neomysia, Csy.

Although the American and European species are probably congeneric, our European colleagues do not seem to have discovered that the name *Mysia* was long since preoccupied when imposed by Mulsant. The name *Neomysia* has therefore to be used for the species of both continents. Crotch, who had probably seen the type, states that *subvittata*, Muls., has the elytra broadly dilated at the sides, which makes it very doubtfully a species of *Neomysia*, where it is placed by Leng, but more probably an *Anatis*, to which genus it is assigned by Crotch. The synonymy proposed by Mr. Leng is therefore erroneous. The assignment of *interrupta* to *Horni* as a variety is, moreover, an error almost as flagrant as that noticed above under *Anatis LeContei;* the two are evidently distinct species, *Horni* being the smaller and much less broadly rounded, irrespective of differences in ornamentation.

Psyllobora, Chev.

Of the described forms in this genus, *20-maculata*, *renifer*, *borealis*, *tædata*, *deficiens* and *nana* are true and valid species; *obsoleta* may be considered a synonym of *20-maculata* and *parvinotata* as a subspecies; *separata* may be regarded as a subspecies of *tædata*.

Tribe EXOPLECTRINI.

This tribe, including such genera as *Rodolia*, *Vedalia*, *Novius* and *Exoplectra*, with rounded form, pubescent surface and wide, externally descending epipleura, should be interpolated in the table of tribes given in my Revision immediately after Epilachnini.

The genus *Neaporia*, of Gorham, is certainly composite and, as no type was named, I would propose *metallica*, Gorh., as the type. *Plagioderina*, Gorh., evidently forms another genus, much more broadly orbicular, for which the name *Aneaporia* (n. gen.) may be suggested. *Indagator*, together possibly with *compta*, probably forms another genus. Some important generic characters doubtless exist in antennal and sternal structure, to which Mr. Gorham makes little or no reference.

Anovia, n. gen.

Body rounded or broadly suboval, convex, evenly punctate and pubescent, the epipleura very vaguely and scarcely visibly impressed for the femora ; prothorax distinctly narrower than the elytra, finely margined at base and truncate at the scutellum, broadly and deeply emarginate at apex; head with the eyes entire, only partially concealed by the prothorax, the epistoma and labrum broadly and very feebly sinuate ; antennæ short and thick, 8-jointed, the club fusoid, with the joints compactly joined ; maxillary palpi thick, the last joint strongly securiform ; prosternum between the coxæ narrow, tumescent, rapidly sloping behind, the mesosternum with a transverse tumescent ridge at apex ; abdominal plates very short, entire ; anterior tibiæ flattened, their external edge longitudinally impressed for the reflexed tarsi ; claws with a laminate internal tooth at base.

The type of this genus, which differs from *Novius* in its broadly and deeply sinuate apex of the prothorax, is the following :

A. virginalis, Wickh.—A cotype of this species from Chadbourne's Ranch, Utah, was kindly given me by Prof. Wickham. It was described under the name *Scymnus virginalis*, but the author recognized its generic incompatibility. The specimens from St. George, Utah, seem to be smaller, less suffusedly coloured and with rather straighter parallel sides of the prothorax, but they have the sixth abdominal segment, as in the cotype, well developed, and almost as long as the fifth ; this sixth segment does not appear to differ much in the two sexes. I also have another specimen, differing but slightly, from El Paso, Texas.

Chilocorus, Leach.

In this genus the species *orbus*, Csy., is not a variety of *bivulnerus*, nor *confusor* a variety of *cacti*, as stated recently by Leng (l. c., 1908, p. 37, 38), but in each case specifically distinct. *Fraternus*, of LeConte, is at least a well differentiated subspecies of *bivulnerus*, recognizable by its smaller size and much less dilated form, as can be observed with greatest ease in large series. *Cacti*, Linn., is a very much larger and more broadly rounded species than *confusor*, as clearly shown by some specimens in my cabinet from Puebla, Mexico, and Honduras ; the latter occupies the arid regions from San Diego to Nogales. I have recently seen a specimen of *fraternus* taken at Nogales, Ariz., which is probably near its extreme southern limit of distribution ; besides being smaller and narrower than *bivulnerus*, the punctuation is much finer and feebler.

I have recently received a typical example of *Axion plagiatum* from Puebla, Mex., and am in position to prove that *Texanum*, Lec., is a distinct species, differing, among other characters, in that in *cacti* the two elytral spots are separated across the dorsal surface by only about half the distance that separates them in *Texanum*, due allowance being made for sexual differences. *Alutaceum* is smaller, narrower and more compressed than *Texanum*, and is probably specifically different; *pleurale* is also in all probability a distinct species and not a variety, as stated by Leng; at any rate, it would be a subspecies of the true *plagiatum* and not of *Texanum*.

Exochomus, Redt.

Brumus, "Weise" (Leng).

Mr. Leng divides this genus into three named subgenera, of which the first, *Arawana*, founded upon *Arizonicus*, is probably a distinct genus and not a subgenus, as it differs in important structural characters as well as in the entire scheme of coloration, which is almost as important. As to *Brumus*, "Weise," I am uncertain whether he means *Brumus*, Muls., or not. In his *Brumus* there apparently should be no acutely angulate quadrate ungual tooth, as in typical *Exochomus*, but there is always either a pronounced basal swelling or bulbosity, as in *parvicollis*, or a rapid thickening of the claw as in *Hogei*, or an almost completely simple form as in *septentrionis*, with the strong probability, when we consider the absolutely similar or correlative scheme of ornamentation and the identical facies, that there are intermediate forms. I therefore still hold that there is but a single genus, and that *Brumus*, "Weise" (Leng) would be a complete synonym of *Exochomus*, if there were no other distinction than that of the dentition of the tarsal claws. The case is parallel to that of *Oxynychus*, Lec., and *Hyperaspis*. But to show how very uncertain the boundaries of *Exochomus* and *Brumus*, Weise, become, when based solely on dentition, it may be stated that in *æthiops*, Bland, the tooth is perfectly distinct and sharply angulate, as usual in *Exochomus*, though rather less elevated, but this species is placed by Weise and more reluctantly by Leng in *Brumus* and not in *Exochomus*. *Subrotundus* has tarsal claws nearly as in *marginipennis*, but with the apical part less abruptly deflexed and, as the ornamentation in *Exochomus* is not highly variable, as assumed, but on the contrary noticeably constant and persistent, I have no doubt that *subrotundus* is a valid species, and this is confirmed by its very small size and almost circular form. To compare it with *fasciatus*, with its much more elongate-oval form and different colour

scheme, as suggested by Leng, is a decided mistake. The tarsal claw of *fasciatus* is wrongly outlined on the plate by Mr. Leng, the basal tooth being large and subparallel as in *marginipennis*, though less elevated.

The tarsal claws in *deflectens*, *latiusculus* and *marginipennis*, very thick at base, with the apical part very slender and abruptly bent downward, are, however, noticeably different from the form assumed in the *æthiops*, *septentrionis* and *desertorum* group. Perhaps it may be this quite perceptible difference in the shape of the claw that constitutes the true difference between *Exochomus* and *Brumus*, and not the mere presence or absence of a basal tooth ; if this be the case the *Brumus* of Leng might possibly be considered a valid subgenus, although there are probably intermediates, and I would prefer to consider our species at least as constituting a single genus. The European *Brumus*, Muls., may, however, be different.*

Septentrionis, Weise, is the northern and eastern species, of unusually large size, called *Davisi* by Mr. Leng, and it is not at all the *Högei* of Gorham, the latter being a far southern and essentially Sonoran form, very distinct in appearance and constant in ornamentation. *Desertorum* and *ovoideus* seem to have given rise to much unnecessary confusion on the part of Mr. Leng, for he puts one in the section with dentate claws and the other in his *Brumus*, Weise. They both belong to the latter section, and are mutually allied, though I am now convinced distinct species or subspecies. *Desertorum* is of very broadly oval outline, and generally has a long anterior wisp like prolongation from the posterior spot, while *ovoideus* is very narrowly and more evenly elliptic, with the humeri scarcely at all exposed at base and has the posterior spot circular and clearly limited throughout its circumference, without suggestion of prolongation. Neither of these forms has anything whatever to do with *Californicus*, either in general appearance or other token of consanguinity.

The following species or subspecies may be made known at this opportunity :

E. deflectens, n. subsp.—Broadly oval, strongly convex, alutaceous and black, the anterior angles of the pronotum nubilously pale; elytra pale

*The genus *Brumus*, Muls., as represented by its type, *8-signata*, which I have examined since the above was written, differs rather radically from this American *Brumus*, "Weise" (Leng), in having an entire basal margin of the pronotum, very large post-coxal arcs, much longer tarsal claws, and in its entire scheme of ornamentation. If, therefore, our species form a genus or subgenus distinct from *Exochomus*, it is still unnamed.

reddish, each with two very large subequal isolated black spots, one just before, the other well behind, the middle, the punctures fine, sparse and inconspicuous ; legs pale, the femora piceous ; claws as in *marginipennis*. Length, 3.0 mm.; width, 2.6 mm. Missouri.

Allied to *marginipennis*, but of broader outline, finer punctuation and with the anterior and posterior black areas of each elytron subequal in size and wholly isolated. It resembles *latiusculus* in form more closely, and may, for the present, be considered a subspecies of the latter, which is specifically different from *marginipennis* in its much more broadly rounded outline.

E. Mormonicus, n. sp.—Very broadly rounded, strongly convex, highly polished, virtually completely impunctate, deep black throughout; tarsal claws well developed, moderately and almost evenly arcuate, with a distinctly defined rectangular basal tooth within. Length, 3.2–4.0 mm.; width, 2.8–3.5 mm. Utah (Marysvale), Wickham.

E. Townsendi, n. sp.—Smaller, much more elongate-oval in form, very convex, polished, deep black throughout, virtually impunctate, the elytra vertically declivous to the lateral bead, which is finer than in *Mormonicus* and *æthiops*, in which species also the elytra become evidently subexplanate along the sides, especially anteriorly ; claws nearly similar, with an even more distinct acute rectangular tooth. Length, 2.8–3.0 mm.; width, 2.2 mm. Mexico (Colonia Garcia, Chihuahua), Townsend.

Mormonicus is larger, very much more nearly circular and more polished than *æthiops*, Bland, and has the elytra practically impunctate even near the thick lateral bead, where numerous distinct punctures are observable in the latter ; the prothorax is also larger and more especially of a different shape, being more elongate along the median line. Besides differing as stated in the description, *Townsendi* is of more narrowly oval form than the feebly alutaceous *æthiops*, and has the front distinctly more advanced before the line of the eyes. Both of these forms are species distinct from *æthiops*.

E. parvicollis, n. sp.—Very broadly rounded, convex, polished, virtually impunctate, black, the anterior thoracic angles not paler ; elytra black, with a broad parallel lateral rufous area from the humeri, obliquely narrowed just before the middle, and extending thence narrowly and more nubilously for a short distance further, also extending along the basal margin, and sometimes with a slight posterior angulation, almost to the scutellum ; also with a subangulate subapical discal pale spot; under

surface irregularly rufescent, the legs black; tarsal claws long, evenly arcuate, with a distinct though rounded swelling internally at base. Length, 2.4–3.0 mm.; width, 2.0–2.7 mm. Utah (St. George), Wickham.

Resembles *desertorum*, but differs in its much shorter and more broadly rounded form and relatively much narrower prothorax. Four homogeneous specimens.

In *septentrionis*, Ws. (= *Davisi*, Leng), the size is large, the form elongate-oval and the punctures rather coarse, deep and very conspicuous; there is only a distant relationship between this and *desertorum* and *ovoideus*, and the latter are properly true species and not varieties, at any rate as far as *septentrionis* is concerned; in them the maxillary palpi have the fourth joint much shorter and more securiform than in *septentrionis* among other differences.

List of Exochomus.

A	B
Exochomus in sp.	*Brumus*, "Weise" (Leng).
1. marginipennis, LeC.—S. Atl.	7. æthiops, Bland.—N. Mex, Col.
prætextatus, Muls.	8. Mormonicus, Csy.—Utah, Nev.
2. fasciatus, Csy.—S. Calif.	9. Townsendi, Csy.—Mex.
3. latiusculus, Csy.—S. Tex.	10. parvicollis, Csy.—Utah.
ssp. deflectens, Csy.—Mo.	11. histrio, Fall.—S. Calif.
4. Childreni, Muls.—Tex., Mex.	12. desertorum, Csy.—Nev.
Guexi, Lec.	ssp.? ovoideus, Csy.—Nev.?
5. Californicus, Csy.—N. Calif.	13. orbiculatus, Leng.—Ariz.
6. subrotundus, Csy.—El Paso.	14. septentrionis, Ws.—N.-East N. Am.
	Davisi, Leng.
	15. Högei, Gorh.—Mex., N. Mex.
	ssp. Nevadensis, Leng.—Nev.

Brachyacantha, Chev.

The following species is allied to *ursina*:

B. Uteella, n. sp.—Form elongate-oval, very convex, polished, minutely, rather sparsely punctate, black; female with yellow spots as in *ursina*, and nearly as large, except that the two medial are relatively more distant from the two basal, so that, instead of forming a square as in *ursina*, they form a slightly elongate rectangle; pale side margin of the prothorax much less broadly dilated anteriorly. Length, 3.6 mm.; width, 2.3 mm. Utah (Milford), Wickham.

A subspecies of *Uteella* may be defined as follows :

B. Sonorana, n. subsp.—Form still narrower than in *Uteella*, ellipsoidal, polished, black, very minutely, decidedly sparsely punctulate ; female with spots nearly as in *Uteella* but much smaller, except that the rectangle formed by the basal and slightly post-medial spots is still more elongated and the humeral spot is reduced to a small dot; the basal spots differ in being very small, nubilous and wholly detached from the margin. Length, 3.0 mm.; width, 2.0 mm. Mexico (Colonia Garcia, Chihuahua), Townsend.

I have not examined the male in either of these forms, which differ profoundly from *ursina* in their narrower, more elongate outline, and, more especially, in the very fine and sparser punctures.

B. metator, n. sp.—Form and coloration nearly as in *testudo*, deep black, polished, the spots sharply defined, rather small and bright yellow ; head (♀) black throughout, the pronotum black, with the yellow lateral margin moderate, dilated somewhat anteriorly ; elytra distinctly though moderately punctate, the spots nearly as in *testudo* but smaller and more widely separated, the basal not basally truncate, but circular and only tangent to the basal margin ; legs pale, the femora gradually piceous toward base. Length, 2.2 mm.; width, 1.7 mm. Texas (Del Rio), Wickham.

Differs from *testudo* and *Bolli* in having the head of the female black and not pale, and in the form of the basal spots of the elytra.

Hyperaspis, Chev.

In this genus the variety which I described under the name *angustata* should be considered a synonym of *elliptica*. On the other hand, the variety that I described under the name *omissa* would appear to have greater value, perhaps fully specific, as the form is rather more oblong and less convex, the punctures more crowded toward the sides of the pronotum, and the total absence of the conspicuous and very constant discal spot of *lateralis* gives it a very different appearance. *Notatula* should be removed from its position as originally published to the vicinity of *4-oculata*. The following species have come to light since my last revision :

H. æmulator, n. sp.—Broadly oval, very convex, black, shining, rather finely and loosely punctate ; head (♀) piceous, very gradually darker basally ; pronotum with a large internally rounded yellow spot, wider than long, at each side ; elytra each with three moderately large

subequal yellow spots, one somewhat obliquely subquadrangular at two-fifths and inner third, another rather smaller, rounded and marginal, just visibly less basal and truncated by the margin, and another, somewhat transversely oval, near the apical margin, and much more distant from the suture; beneath black, the abdomen pale marginally, the legs pale. Length, 2.6 mm.; width, 2.0 mm. Arizona (Nogales), Nunenmacher.

To be classed with *medialis*, but not closely related, much larger, with slightly more anterior discal spot and piceous head in the female. The head is pale in both sexes of *medialis*.

H. fastidiosa, n. sp.—Broadly suboblong-oval, convex, black, polished, finely though rather strongly and closely punctate; head (♂) dark rufo-piceous, gradually becoming blackish basally and yellowish apically; pronotum with a large yellow spot, internally angulate and wider than long, at each side; elytra each with three large yellow spots, one elongate-oval, from basal seventh to the middle and inner sixth to just beyond the middle; another, marginal, from the humeri to apical third, acuminate anteriorly, and gradually though moderately dilated posteriorly, the third large, subobtriangular, very close to the apical margin, and but little further from the suture; beneath black, the abdomen nubilously pale marginally, the legs pale. Length, 2.2 mm.; width, 1.65 mm. California (San Diego), Nunenmacher.

H. conspirans, n. sp.—Smaller, less broadly and more evenly oval, convex, polished, black, finely, less closely punctate; head (♂) bright yellowish-white, abruptly black only at the base of the occiput; pronotum with a large internally arcuate yellow spot, as wide as long, at each side; elytra each with three rather large similarly straw-yellow spots, one rounded, from basal fourth to the middle and inner fifth to a little beyond the median line; another, marginal, semicircular, at the middle and the third somewhat smaller, slightly irregular, subtransversely oval, distinctly separated from the apical margin, and subequally so from the suture; under surface black throughout, the legs black, the anterior pale. Length, 1.6 mm.; width, 1.1 mm. Arizona (Nogales), Nunenmacher.

Both of the above species are allied to *gemma*, the first differing in its very differently coloured head in the male, and total absence of the conspicuous yellow apical thoracic margin of *gemma*. The second has the same pale yellow head in the male, but lacks the pale apical thoracic margin or any indication that it could exist, as the lateral spots are

rounded internally, their arcuate margin becoming more externally oblique anteriorly to the apical angles; a very similar species, of which I only have females at present, occurs at Alpine, Texas.

Mr. Chas. Schaeffer (Sci. Bull., Br. Inst., Vol. 1, p. 145) confuses *medialis*, and inferentially also *gemma*, *fastidiosa* and *conspirans*, with *sexverrucata*, Fabr., and *pratensis*, Lec., must be closely related. But Mr. Schaeffer is mistaken in this, as a little closer observation would have shown him that there are a number of distinct species, and, on consulting Mulsant's description of *sexverrucata* (Spec., p. 639), which is a South American insect, he would have read the following diagnosis: Briefly and obtusely oval; prothorax brown or red-brown, ornamented each side with a yellow border; elytra black or brown, each with three yellow spots, two suborbicular near two-fifths of the length, the external bound to the lateral border, the third subapical, obtriangular. The coloration of the pronotum prohibits any close alliance with these Sonoran forms, and Gorham was hasty in assigning those from northern Mexico to this species. It is a common type in the fauna of Mexico, but includes many indubitable species. Mr. Schaeffer seems of late to be somewhat solicitous concerning the distinctness of *Lengi* and *rotunda* (Journ. N. Y. Ent. Soc., Sept., 1908); the two appear to me to be amply distinct species, indeed not even closely related.

H. imperialis, n. sp.—Moderately broadly oval, very convex, polished, black, rather finely but strongly, the elytra not very closely, punctate; head (♀) dull, black; pronotum black, the sides yellowish-red, the pale area longer than wide, parallel, with its inner margin bisinuate; elytra with the umboniform callus at basal fifth unusually pronounced, black, each with a large evenly elliptical dull red spot, from a fifth to six-sevenths of the length, and from inner fifth at apical fourth, where it approaches the suture most closely, to within a short but appreciable distance of the lateral margin; under surface and legs black throughout. Length, 3.6 mm.; width, 2.8 mm. Mexico (Puebla).

This very distinct species belongs to the same group as the Florida *regalis* and Mexican *panzosæ*. It differs from the latter in its more elongate form, much less basal pale elytral area, and in having the sides of the pronotum pale.

H. oculifera, n. sp.—Broadly oval, convex, shining, strongly and rather closely punctate, black, the entire head and a large subquadrate

spot at each side of the pronotum pale (♂); elytra each with a rounded yellowish spot at posterior third, barely perceptibly more distant from the suture than the side margin; legs short, dark testaceous, the posterior piceous-black, though paler at the knees. Length, 2.1 mm.; width, 1.6 mm. Arizona (Benson), Nunenmacher.

Belongs near *Wickhami*, but differs in the stronger and rather closer punctures, larger eyes, with narrower interocular surface and in the position of the elytral spots, which are much more nearly on the median longitudinal line.

H. significans, n. sp.—Oval, convex, polished, moderately finely and sparsely but rather strongly punctate, strongly and closely so beneath, black, the entire head and narrow pronotal side-margins pale (♂), or with the former picescent and the side-margins nubilous (♀); elytra with a large and irregularly rounded lateral spot of red at the middle of the margin, by which it is diametrally truncated, and sometimes extending more than half way across the elytron; under surface piceous, rufescent peripherally, the legs slightly pale, the hind femora darker. Length, 2.2–2.5 mm.; width, 1.5–1.75 mm. Utah (St. George), Wickham.

May be placed near *pleuralis*, but differs in the much larger, red and less sharply-defined lateral spot, and much more elongate-oval form of body.

H. concurrens, n. sp.—Moderately elongate-oval, black or piceous-black throughout, polished, finely, not closely and rather strongly punctate; head (♂) pale, finely punctate and pubescent throughout; pronotum narrowly, nubilously rufescent at the sides; elytra without maculation of any sort; under surface piceous-brown, the metasternum densely punctate laterally. Length, 2 0–2.3 mm.; width, 1.4–1.65 mm. Utah (St. George), Wickham.

This distinct species may also be placed in the neighbourhood of *pleuralis*.

H. aterrima, n. sp.—Form nearly as in the preceding but smaller in size, deep black throughout (♀), or with the entire head and narrow, abruptly-defined sides of the pronotum yellow (♂); elytra without maculation, polished, finely, rather sparsely punctate; under surface more coarsely, less densely punctate, black, the tibiæ and tarsi feebly pallescent. Length, 1.6–2.1 mm.; width, 1.2–1.4 mm.—Utah (St. George), Wickham.

Differs from the preceding in its bright yellow and sharply-defined anterior markings of the male, but more particularly in the feebly punctate

and wholly glabrous frontal surface. The eyes are notably larger and the front narrower in the male than in the female.

H. coloradana, n. sp.—Form moderately elongate, oblong-suboval, not very convex, polished, strongly, not densely punctate, black; head, except at each side of the basal margin, and sides of the pronotum abruptly and narrowly but not extending to the base, though finely throughout the apical margin, yellow (♂); elytra with a moderately narrow, abrupt, subparallel yellow side margin from base to apical third, and a rather small, widely detached subapical spot; under surface black, the anterior legs pale; mes-episterna pale in external half. Length, 2.2 mm.; width, 1.6 mm. Colorado (Boulder Co.).

Resembles the Californian *dissoluta*, Cr., very greatly, but has the yellow side margin of the elytra much less sinuated internally and shorter, the apical spot smaller and rather nearer the suture and the outer half of the mes-episterna pale, but, more especially, in the much less convex, more oblong and less oval form of the body.

H. serena, n. sp.—Coloration, lustre and punctuation throughout nearly as in *inflexa*, but with the expanded apex of the marginal reddish vitta less anteriorly extended; form of the body more narrowly oblong and parallel, not regularly oval as in *inflexa*; abdominal plate more broadly rounded and not quite attaining the first suture. Length 2.5 mm.; width, 1.7 mm. Pennsylvania, Warren Knaus.

Differs from *inflexa* in the form of the body and other characters.

H. Nunenmacheri, n. sp.—Rather broadly oval and convex, nearly as in *postica*, black, polished, sparsely but more distinctly punctate; head and pronotum (♀) black, the latter without trace of pale side margin; elytra each with a parallelogramic marginal yellow spot at base, twice as long as wide, ending abruptly behind and truncate, and also a transversely but broadly oval subapical spot, twice as far from the suture as the apical margin; beneath black throughout, the tibiæ somewhat, and the tarsi decidedly, pale. Length, 2.75 mm.; width, 2.05 mm. California (Riverside), Nunenmacher.

Allied to *postica*, Lec., but differs in the absence of the pale sides of the pronotum and in the presence of a short, broad, parallel humeral spot on the elytra.

H. protensa, n. sp.—Rather more elongate, narrow and parallel than any other species, shining, deep black above and beneath, the head and pronotum wholly black (♀), the elytra with a narrow even and feebly

bisinuate yellow side margin, which is continuous throughout, though retreating from the edge posteriorly, not quite attaining the suture ; under surface feebly and rather sparsely punctate, the anterior legs pallescent. Length, 1.8 mm.; width, 1.15 mm. Arizona (Nogales), Nunenmacher.

Belongs near *limbalis*, the ornamentation being almost identical, though more closely approaching the suture at apex, but differing greatly in the narrower, more elongate and parallel and much less oval form of body, and also in the sparser and very much feebler punctuation of the under surface. *Spiculinota*, Fall, belongs to the *4-oculata* series, as do also the two following :

H. fidelis, n. sp.—Form slightly more broadly oval, convex, polished, black ; head black (♀), the pronotum with a similar lateral pale margin ; elytra similarly rather strongly punctate, with a narrow pale lateral border, which is feebly and broadly sinuate within, in basal two-thirds, a large subtriangular subapical spot and a discal spot twice as long as wide, the centre of which is only very slightly before the middle ; under surface black, the abdomen finely, sparsely punctate, the legs all pale red-brown, the metacoxal plate not quite attaining the apex of the segment, which it fully attains in *4-oculata*. Length, 2.3 mm.; width, 1.6 mm. California (Los Angeles).

H. Bensonica, n. sp.—Still more broadly oval and a little more convex, polished, black ; head pale, except at the basal margin (♂), the pronotum with narrow parallel pale sides ; elytra sparsely but strongly punctate, with a narrow yellow lateral border, which is strongly sinuated within and extending from the base to apical third, a transversely oval subapical spot and a circular discal spot at basal two-fifths, much in advance of the spot in *4-oculata* or *notatula;* abdomen more closely and strongly punctate, the legs blackish, except the anterior, the metacoxal plate about attaining the segmental apex. Length, 2.0 mm.; width, 1.5 mm. Arizona (Benson), Nunenmacher.

In the true *4-oculata*, from the middle California coast regions, there is normally no yellow elytral margin or spots, but occasionally there are two very feeble elongate streaks, at base and behind the middle. The male has the black base of the front deeply angulate, while in the male of *notatula* the black at the base is transversely truncate, except at the sides, where the pale area extends further posteriorly along the eyes, in a way just the reverse of *4-oculata*. *Horni*, of Crotch, would appear to be different from *4-oculata* and not identical, as I suggested in my Revision,

for the author states that it is smaller than *undulata*, shorter and rounder, more finely punctate, the elytra with a straight pale margin for two-thirds, a discal spot much nearer the base even than in that species and a triangular subapical spot. LeConte stated that it was a synonym of *lateralis*, but that is even more unlikely.

H. Octavia, n. sp.—Form nearly as in *undulata* but sensibly more broadly oval, more polished, deep black; head and pronotum (♂, ♀) almost similar, the latter more transverse; elytra more sparsely but more coarsely punctate, the punctures more impressed, each with three rather small and rounded, widely separated yellow spots along the sides, and one, discal and rounded, evidently before the middle. Length, 2.25–2.5 mm.; width, 1.6–1.8 mm. Mississippi (Vicksburg).

Related to *undulata* but differing in its more polished surface, coarser punctures, small, rounded, widely separated marginal spots, which never have any tendency to coalesce, in having the outer limit of the post-coxal arcs more distant from the abdominal side margin and the greater part of the mes-episterna pale in colour in the male, and not black throughout as in the male of *undulata*.

H. filiola, n. sp.—Elongate-oval, only moderately convex, obtuse before and behind, black, rather shining, the head alutaceous, the punctures rather strong and impressed but only moderately close-set; head and pronotum black throughout (♀); elytra with yellow side margin subequally wide throughout, bisinuate within, the apical part but little dilated, receding from the edge, nearly attaining the suture, and making an angle of about 100° with the part before it; each also with an elongate yellow spot, rather small in size, extending from three-sevenths to three-fifths of the length, and from inner two-sevenths not quite to the median line; under surface blackish, the tibiæ and tarsi paler. Length, 2.1 mm.; width, 1.1 mm. Arizona (Nogales), Nunenmacher.

This small but distinct species may be placed near *paludicola*.

H. revocans, n. sp.—Very small, rather broadly oval, broadly obtuse behind, shining, black, wholly glabrous; head and sides and apex of the pronotum rather broadly yellow (♂), the latter finely punctulate; elytra virtually impunctate, the punctures very minute, only visible under high power, the side margins from base to apical third, moderately sinuate within, and on each a large subapical transversely oval spot and a broad discal vitta, somewhat sinuate on each of its sides, from the scutellum

obliquely backward to a little beyond the middle near inner third, yellowish-white; under surface piceous, the abdomen rather closely and strongly though finely punctate. Length, 1.4 mm.; width, 1.1 mm. Utah (St. George), Wickham.

This is a wholly isolated species, somewhat remindful at first of the genus *Hyperaspidius;* it may be placed just before *annexa* in the list but has no affinity with that species. The tarsal claws are obtusely swollen internally at base.

H. tetraneura, n. sp.—Nearly as in *4-vittata*, though very slightly more broadly oval and decidedly less convex, similarly rather strongly and closely punctate, black, polished; head black; pronotum (♀?) black, with a very narrow, not very abruptly pale side margin; elytra with the side margin evenly and very narrowly pale to but little beyond two-thirds, each also with a similarly narrow even pale oblique vitta from basal sixth, slightly beyond the median line, to apical fifth at inner third. Length, 2.3 mm.; width, 1.45 mm. Colorado (Boulder Co.).

Resembles *4-vittata*, but differs in the abruptly abbreviated and much narrower vittæ, more finely and sparsely punctate abdomen, and, especially, in the much more narrowly rounded post-coxal arcs, which scarcely attain the first suture, along which they are contiguous for some distance in *4-vittata*.

The species described by Mr. Schaeffer (l. c., p. 143) as *Hyperaspis trifurcata*, is strongly remindful, in its form and general scheme of ornamentation, of a species published by me under the name *Hyperaspidius insignis*, and I would therefore advise a closer scrutiny of its generic characters. The species, though, is doubtless different.

Hyperaspidius, Cr.

The species described by LeConte under the name *vittigera* is not by any means the same as the Mexican *trimaculatus*, Linn., as becomes apparent at once on reading Mulsant's description of the latter. The species should therefore be known under LeConte's name, *vittigera* (=*trimaculatus*, Cr., nec Linn.).

H. pallescens, n. sp.—Broadly oblong, very obtuse at apex, moderately convex, polished; head and pronotum (♀) rufo-testaceous, the latter subimpunctate, with a narrow yellowish-white side margin; elytra rather finely and sparsely but strongly and evenly punctate, smooth, pale reddish-brown, the basal and lateral margins, retreating from the edge posteriorly, and not quite attaining the suture at apex, whitish, the basal stripe prolonged posteriorly, near the suture, touching or feebly joining the apex

of the marginal stripe; legs pale. Length, 1.3 mm.; width, 1.0 mm. Arizona (Nogales), Nunenmacher.

Allied to *vittigera* but smoother, more broadly oblong and differing in colour. The prothorax is but little narrower than the elytra and two and one-half times as wide as its greatest length. The species from El Paso, which I identified as *trimaculatus*, Linn. (Rev., p. 130), is as follows:

H. oblongus, n. sp.—(=*trimaculatus*, Csy., nec Linn.).—Differs greatly from *vittigera*, Lec., in the ornamentation of the male pronotum, which is said to be yellow, with a large basal black spot anteriorly lobed and extending beyond the middle in that species, according to Crotch (Rev., p. 232). It occurs in Missouri.

A REMARKABLE CECIDOMYIID FLY.

BY T. D. A. COCKERELL, BOULDER, COLORADO.

On Sept. 24, 1908, as I was walking down Seventeenth St, Boulder, Colorado, I noticed a very singular fly upon the pavement. At first sight I thought it might be a small Bibionid of some sort, but when I had it in the bottle, I was delighted to find that it was a most peculiar Cecidomyiid. It is one of the *Hormomyia* group, the first to be recorded from the West. I describe it as a *Hormomyia*, though its peculiar characters may eventually entitle it to a separate generic name.

Hormomyia coloradensis, n. sp.

♂.—Length, 5¼ mm.; wings almost 6; thorax blood-red, so arched over head that the latter is quite invisible from above, and only the eyes can be seen from an angle of about 45° in front; dorsum of thorax with short scanty black hair; head pale; antennæ dark, at first sight appearing 26-jointed, but really 14-jointed, the joints after the first two being divided into a basal swelling and an apical double swelling, each of the three swellings (counting the apical as two) ornamented with small white loops, while the lowest and highest each emit many long black bristles; all this being exactly as *Xylodiplosis præcox* (Bull. Soc. Ent., France, 1895, p. cxii), except that the long bristles are much longer, being much more than twice the length of the loops; wings strongly dusky, with much dark hair and a conspicuous dark fringe; legs very thick, almost

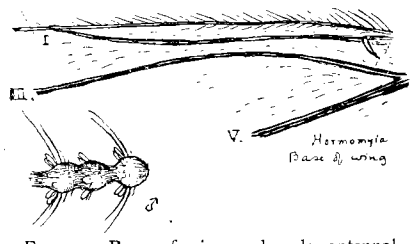

FIG. 19.—Base of wing and male antennal joints of Hormomyia.