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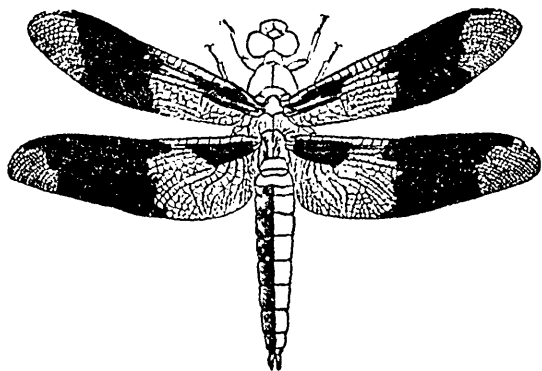
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ANNUAL MEETING AT LONDON, ON OCTOBER 12th AND 13th,
AT THE ROOMS OF THE SOCIETY, Y. M. C. A. BUILDING.

The
Canadian Entomologist

VOLUME XXIX.

No. 10.



LIBELLULA TRIMACULATA.

EDITED BY

REV. C. J. S. BETHUNE,

HEAD MASTER OF TRINITY COLLEGE SCHOOL,

PORT HOPE, ONTARIO.



OCTOBER, 1897.

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1897.

EXCHANGE.

Subscribers are invited to make liberal use of this column. Notices over three lines are liable to be shortened if necessary. All insertions free to subscribers.

LEPIDOPTERA.—I have a lot of very fine material from Minnesota and other localities. Send lists immediately and be first to get your pick. HENRY W. EUSTIS, 617 South 9th street, Minneapolis, Minn.

Cynipidæ and Typhlocybinæ wanted, named or unnamed, from all quarters. Will offer, in exchange, Colo. insects in any order. C. P. GILLETTE, Fort Collins, Col.

WANTED.—First An. Report on Nox. Insects of Illinois, by B. D. Walsh, 1868. I have for sale or exchange a complete set of Dr. Fitch's fourteen Repts. on the Insects of New York. Address, M. V. SLINGERLAND, Ithaca, N. Y.

LEPIDOPTERA.—I desire long series of *Plusias* from all parts of boreal North America. Will purchase or give liberal exchanges. Correspondence invited. R. OTTOLENGUI, 115 Madison Ave., New York.

N. A. LEPIDOPTERA.—Exchange desired. Also a lot of exotic Coleoptera, named and unnamed. What offers? Will collect in other orders.—E. V. RIPPON, 129 Hazleton Ave., Toronto.

KERMES.—Desired from North America. Will return identified material. E. E. BOGUE, Agr. Expt. Sta., Stillwater, Oklahoma.

LEPIDOPTERA desired from all parts of N. America. Will collect in other orders in exchange. C. H. TYERS, 227 Front Street East, Toronto.

LEPIDOPTERA.—Exotic and native cocoons and pupæ. Preserved larvae. Especially *Rhopolocera*. Correspondence invited. W. S. KEARFORT, 24 South Water St., Cleveland, Ohio.

WILL COLLECT in many orders of Entomology and Herpetology of Arizona. Address DR. R. E. KUNZE, Phoenix, Arizona.

I OFFER perfect specimens of named diurnals from Central America and Northern South America, in papers, for diurnals from Northwest, Western and Southwestern States. LEVI W. MENGEL, Reading, Pa.

WILL COLLECT any Aquatic insects to exchange for Odonata and Plecoptera, nymphs or imagoes; nymphs preferred. Will determine nymphs or imagoes in these orders for duplicates. JAMES G. NEEDHAM, Cornell University, Ithaca, N. Y.

COLLECTORS OF AQUATIC COLEOPTERA should save all the Aquatic Hemiptera taken with the beetles dredging or at light. I will give exchange for all such Hemiptera in any order, or purchase. CARL F. BAKER, Auburn, Alabama.

COLEOPTERA.—Exchange desired; only perfect specimens given and received. Will also collect in other orders in exchange for Coleoptera of N. A. R. J. CREW, 105 Oak St., Toronto, Ont.

N. A. LEPIDOPTERA not in my collection wanted; offer Manitoba Lepidoptera and Coleoptera. Send lists to A. W. HANHAM, Bank of B. N. A., Winnipeg, Man., Can.

CANADIAN ICHNEUMONIDÆ—Will be glad to purchase undetermined material in this family, particularly from the vicinity of Quebec. Will determine or exchange specimens if parties prefer. G. C. DAVIS, Agricultural College P. O., Michigan.

COLEOPTERA.—Wanted, Halipidæ, Gyrinidæ, and Rhynchitidæ, named or unnamed; also *Atelabus genalis*. Good returns of named N. American Coleoptera. RALPH HOPPING, Redstone Park, Kaweah, California.

Correspondents desired in any part of the world who will collect Hesperidæ (either named or unnamed) in exchange for N. H. Lepidoptera. W. F. FISKE, Mast Yard, N. H., U. S. A.

WANTED.—Diptera of the families Sarcophagidæ and Muscidæ (sensu stricto) from all localities. Will purchase or exchange for insects of any order. GARRY DEN HOUGH, M. D., 542 County St., New Bedford, Mass.

HYMENOPTERA.—Fossors and Bees wanted from West and South (named or unnamed). Offer in return good American and European Col., Lep. or Hym. S. N. DUNNING, 43 Niles St., Hartford, Ct., U. S. A.

VANCOUVER ISLAND.—Lepidoptera for sale or exchange—*C. gigas*, *M. Taylori*, *A. rhodope*; *New nactuidæ*. W. H. DANBY, P. O. Box 314, Victoria, British Columbia.

EUROPEAN COLEOPTERA.—I have a large quantity of European Coleoptera which I wish to exchange for American. Lists furnished. PAUL J. ROELOFS, 90 Rue van Straelen, Antwerp, Belgium.

The Canadian Entomologist.

VOL. XXIX.

LONDON, OCTOBER, 1897.

No. 10.

BROOD XV. OF CICADA SEPTENDECIM IN OHIO.*

BY F. M. WEBSTER, WOOSTER, OHIO.

Having had the opportunity of working out the distribution of broods V., VIII. and XXII. in Indiana, brood XV. in Ohio possessed a peculiar interest for me, as in studying it I was able to profit considerably by my acquaintance with the others. I perhaps ought to say a word in regard to the three other broods mentioned, as one of them (XXII.) is treated of at considerable length in the Report of the Entomologist of the United States Department of Agriculture for the year 1885, and it was while connected with the Department as one of its special agents that these three broods were studied. Brood XXII. covered the entire State of Indiana, except a narrow strip of land around the lower end of Lake Michigan, from ten or fifteen to twenty miles wide, which area was exactly covered by brood V. in 1888. The coloured map which accompanies the report mentioned is defective in that the two points extending southward, not indicated as being covered by this brood, were, as was afterwards learned, within the area covered by brood XXII. and not covered by brood V., the line of separation being about ten miles east of the lake on the line between Michigan and Indiana, and running nearly south-west to the east line of Porter county, the course then trending slightly more to the westward to the Illinois line; in no case, I believe, extending to the Kankakee River, thus making the line of separation much more uniform than the one indicated on the map cited above, on which the dividing line is quite irregular.

Brood VIII. occurred in southern Indiana, becoming excessively abundant only in Harrison county, but covering the area south of a line drawn from Vincennes to Greencastle, Franklin, and eastward to northern Dearborn county. Singularly enough, a single female was brought me at Lafayette, fully 60 miles north of Greencastle, which probably marked the northernmost point where the species could be said to occur in any numbers.

* Read before Section "F," Zoology, of A. A. A. S., at Detroit, Michigan, August 10th, 1897.

One of the most striking peculiarities of brood XV. in Ohio was its exceedingly uneven distribution within the boundaries of its range. On driving over the country during the midst of the season of greatest activity, one would suddenly find himself in the midst of a din that was almost deafening, and the woods would be browned with discoloured twigs, while within a mile he would find himself in the midst of a silence that from contrast was almost oppressive, while there was not a discoloured twig to be observed. This lack of uniformity in distribution rendered the work of locating the exact boundaries of the brood quite difficult in some cases, as one must often go miles beyond it in order to be quite sure that he had found the last outlying colony. But in other cases the effect was the reverse. In going southward from Painesville, over the P. & W. Ry., which cuts through what is locally known as "Johnnycake Ridge," not a note was to be heard, and not a discoloured twig was to be seen on tree or shrub, but on leaving the cut, which is by no means a long one, the combined notes of the thousands of Cicadas were clearly heard above the noise of the train, while scarcely a tree or bush escaped the attack of the females, and some of them would not have been more thoroughly browned if a fire had broken out among them. In the city of Lancaster they were reported as abundant in the east part of the town, while there were scarcely any in the western portion, and it turns out that the dividing line between this brood and brood XXII. is practically indicated, as nearly the same conditions were observed to occur seventeen years ago.

The brood is certainly becoming weakened each time it reappears, and the boundaries of its occurrence did not in many cases extend as far as they did when it last appeared, sometimes the difference amounting to several miles. Near Painesville it occurred some three miles nearer to the lake shore in 1846 and in 1863 than it did in 1880 or the present year. It was at Bellevue in 1880, but did not extend so far west this year, and the same is true of its occurrence northward toward the lake. Where it was quite abundant in 1880 it did not appear at all this year. It was reported by two observing correspondents as having been present in limited numbers in Ashtabula county in 1863 and again in 1880, but no trace of it could be found this year. In short, it seems to be slowly but surely dying out, and will in time be known only in history. Brood XXII. is a much stronger one—at least it was in Indiana—but I question if in time the Periodical Cicada is not wholly exterminated in Ohio, and there seems no reason why this should not be true of many other States. The gradual

extinction of the native forests will have much to do with this, but their natural enemies, especially the English sparrow, are having a much more fatal effect.

In 1885, in Indiana, I first saw the English sparrow come in contact with the Periodical Cicada. In the city of Lafayette the insect appeared in considerable abundance, and for a few days there was no lack of the well-known notes of the male, but suddenly there was a decided falling off, and by listening carefully one would occasionally detect a note suddenly cut short at its very height, and close watching revealed the fact that the sparrows had come to recognize the note as well as the form of the musician, and as a result, within a few days, though there were myriads in the woods, not a single one could be found in the city, the abundance of wings upon the pavements showing too well the tragedies that had been enacted there.

With these observations in mind, I watched for the coming of brood XV. in Ohio with considerable interest. On the morning of May 28th a full complement of wings was found on the pavement under a shade tree, and during the following days these detached wings became more numerous, but not a Cicada note was heard. Going out into the residential portion of the town at dusk, I would observe pupæ emerging from the lawns and making their way to the shade trees across the pavement bordering the street, but not one could be found the next morning, though the pavement was littered with detached wings. While back in the woods a half mile away there were great numbers of them, creating almost a continual din during the day; in town during the whole season I only saw a single living adult and heard not a single note.

In southern Ohio I one day watched the Cicadas attempting to make their way across a clearing, from a bit of woods to an orchard situated some distance away and below the woods, which was on a bluff. The afternoon sun shone directly across the clearing, thus enabling me to witness every attempt of the insects to fly from woods to orchard. The sparrows were in the latter, and the moment a Cicada appeared its silvery wings would glisten in the sunlight for a few moments, when a sparrow or sometimes two of them would make a dash for it, and if the prey was missed, as was sometimes the case, the bird would turn suddenly and try again, generally with better success. I watched the actions of birds and insects for a couple of hours, but did not see a single Cicada cross the clearing. Though there were numbers of *Pieris rapæ* and some other

butterflies winging their way about over the clearing, I did not see a single mistake made on the part of the sparrows. They had become adept enough in two or three weeks to be able to distinguish a Cicada with an unerringness that was simply surprising, when we come to consider that none of their immediate progenitors could have seen or tasted a Cicada.

Other bird enemies appear to be very few, and these not over-voracious. Mr. J. J. Harrison, of Painesville, Ohio, saw the crow black-bird feeding upon them in 1846, while the labourers on the Station Farm at Wooster claim to have observed the robin to attack them. A species of *Tachina* fly seemed to play havoc with the latter portion of the brood, and either owing to this or some other reason, they suddenly disappeared between June 24th and June 28th. On the former date, in the Experiment Station orchard, they were excessively abundant, while on the latter there was not a living Cicada to be found there, while the stench arising from the dead bodies was quite apparent to one walking through the orchard.

As usual, the injury inflicted was slight, except in cases of very young orchards, and I saw in one case a, to me at least, unique form of attack. This is shown in the plate (fig. 3), and instead of the regular, quite conspicuous punctures (fig. 2) made by the female for a nidus, she appeared to have simply thrust her ovipositor into the wood, and with no further external wound deposited her ova.

The distribution of the brood in Ohio is illustrated in the accompanying map, plate 8, fig. 1.

In its distribution, rivers do not appear to have had much influence, as it will be noticed that in southern Meigs county a small area outlined by a bend in the Ohio River is only partly covered; in one township, Letart, the Cicada not being found at all; while a corresponding point of West Virginia comes within the range of distribution, even though lying across the river. From this point the dividing line trends slightly to the south-west, passing north of Gallipolis, and extending to the Scioto River, at a point a few miles above its mouth, but not extending beyond this to the westward. North the line follows the east bank of the river until the bend between Waverly and Chillicothe is reached, when it crosses the river and holds to its nearly northerly course to near Circleville. Here the line makes a sharp curve to the north-east to the city of Lancaster, in Fairfield county, but trends north-west to the eastern line of Franklin county, thence almost northward along the east line of

Delaware and Morrow counties to a point in Richland county about a mile west of the village of Ontario, when it changes again to the north-west, crossing the north-east corner of Crawford and the south-east corner of Seneca, then a little east of north to a point near Lake Erie, a mile and a half south-west of the city of Huron, Erie county. This area in Erie county is, however, but little more than a peninsula-like extension, and will probably not appear again. Near the south line of Erie county the line of demarcation makes a broad sweep to the south-east, thus leaving both the north-west and north-east corners of Huron county unoccupied, as well as all of Lorain county, except the southern portion and south-eastern border, and the western end of Cuyahoga county. Just west of Cleveland another peninsular extension occurs lakeward, where the Cicada appeared for a few days at first, but suddenly disappeared before the brood reached its maximum in numbers in the adjacent counties. This also will hardly appear again. From this point to near the eastern end of Lake county the insect keeps well back from the lake, though it formerly occupied ground much nearer to the shore. The eastern terminus also comprises but little more than a promontory, as the course here changes broadly to the south-west and then to the south east, leaving a considerable portion of eastern Geauga county and the north-east corner of Portage county unoccupied. The dividing line here only touches the south-west corner of Trumbull county and includes the western end of Mahoning and Columbiana counties and the southern border of the latter, the line passing into West Virginia or Pennsylvania, near East Liverpool, Ohio, where this year a very few Cicadas appeared, and where brood XV. overlaps brood XX.

I shall be obliged to confess that when I began to map out the area covered by brood XV. it was with more enthusiasm than I could command when I finished the survey. The map indicates, with a good degree of accuracy, the area over which the brood occurred in 1897, but that it will as accurately show the area covered by the brood in 1914, I have no expectations. The continued destruction of forests and the inroads made upon the brood by its natural enemies will result in great changes, not only in the outline of the area of habitation, but this will be composed of more and more isolated and continually decreasing "Cicada Islands," as I might term them, until the well-known notes of the male will have ceased forever, and the voiceless female will have followed her spouse into the shades of oblivion.

THE NINTH ANNUAL MEETING OF THE ASSOCIATION OF
ECONOMIC ENTOMOLOGISTS, DETROIT, MICH.,
AUGUST 12TH AND 13TH, 1897.

The Association met in Room 212, Central High School Building, immediately following the adjournment of Section F. Thirteen active members were present, together with many visitors, prominent among the latter being Dr. C. A. Dohrn, Prof. E. B. Poulton, Dr. C. P. Hart, Dr. C. S. Minot, and Dr. C. W. Stiles. The Association was called to order by the President, and in the absence of Secretary Marlatt a secretary *pro tem.* was chosen. The address of the retiring president, Prof. F. M. Webster, treated of "The Present and Future of Applied Economic Entomology in the United States," and contained, among other very interesting features, an admirable tribute to the value of the systematist and a somewhat caustic criticism of the "species maker," helpful suggestions for the experiment station worker, and a very frank discussion of the unfortunate results which attend the attempts sometimes made to combine politics and science. The following were elected to active membership :

G. B. King, Lawrence, Mass.

Gerald McCarthy, Raleigh, N. C.

E. P. Felt, Albany, N. Y.

A. F. Burgess, Malden, Mass.

W. B. Barrows, Agricultural College, Mich.

R. H. Pettit, Agricultural College, Mich.

W. S. Blatchley, Indianapolis, Ind.

The following were elected foreign members :

Claude Fuller and Richard Helm, both of Perth, West Australia.

These additions increase the numbers of this Association to ninety-three active and thirty-one foreign members.

Following the election of members, Dr. L. O. Howard presented "Additional Notes on the Parasites of *Orgyia leucostigma*." This paper gave the results of the rearing of a large number of primary and secondary parasites, and contained a general discussion of the different phases of insect parasitisms.

"Temperature Effects as Affecting Received Ideas Concerning the Hibernation of Insects," by the same author, showed that a sudden alternation between low and high temperatures was remarkably fatal to the larvæ of clothes moths, Buffalo carpet beetles, and other insects of allied habits.

An abstract of "Notes on Certain Species of Coleoptera that Attack Useful Plants," by F. H. Chittenden, was read by the secretary *pro tem*. These notes treated chiefly of the food plants and habits of certain Chrysomelids.

A letter from Miss E. A. Ormerod called particular attention to the fact that the house sparrow had been very abundant and very obnoxious in certain parts of England, and it seemed probable that some legislation or public measures would need to be adopted to control this bird. The arrival from Tripoli of a cargo of wheat badly infested by the Angoumois moth was recorded and reference made to the occurrence in injurious numbers of *Xyleborus dispar* at Teddington.

Prof. P. H. Rolfs presented notes on "A Fungus Disease of the San José Scale." This disease seems to be confined to the southern part of the United States, but is very helpful to fruit growers there. The scale has been almost eradicated from several orchards by this disease. Laboratory and field experiments now in progress promise helpful results, but it does not seem probable that this disease will be of value in the northern part of the United States, since warmth and moisture are necessary for its development.

Mr. Barrows made a brief statement concerning the distribution of the San José scale in Michigan. The insect had been found scattered throughout the southern counties of the State, where it had probably existed for eight years. In discussing this paper, Mr. Craig spoke of the occurrence of the scale in southern Ontario, where there were at least seven infested localities.

A paper from Prof. C. P. Gillette, on "Insects Taken at Light and Sugar," evoked considerable discussion, and was followed by "A Study of the Possible Origin and Distribution of the Chinch Bug," by Prof. F. M. Webster. The author advanced the idea that this insect had originated in the southern part of the United States, and spread by two diverging streams up the Mississippi Valley and along the eastern Atlantic coast. In the former region the long-winged form predominated, while the coast form was short-winged. In the discussion following this paper the general opinion seemed to be that the length of the wings depended upon environment rather than heredity. Mr. C. W. Mally recorded the capture at Ohio of a specimen having one long and one short wing, thus throwing additional light upon the relationship between the two forms.

"Notes on the Common House Fly," by Mr. Howard, gave the

negative results of a series of experiments with lime, land plaster, etc., used to destroy the larvæ of the house fly. He emphasized the necessity of greater cleanliness in the management of horse stables.

A paper from Mr. Gillette, on "Vernacular Names of Insects," was read and referred to a committee consisting of Messrs. Howard, Fernald and Lintner. A communication from C. P. Lounsbury, giving very interesting notes on "Cape of Good Hope Insects," particularly the locusts of that region, was then read.

Mr. H. G. Hubbard presented an account of the "Insect Fauna of the Giant Cactus," recording the capture of a large number of insects on this plant and giving notes on their habits.

Mr. Howard described "A Valuable Coccid" lately discovered in Arizona and New Mexico, from which, by suitable treatment, a good grade of white wax could be obtained. The refuse from this operation is of the nature and consistence of India-rubber, and may be of commercial value.

"Notes on Insects of the Year," by Messrs. Webster and Mally, recording interesting experiences with several of the common insect pests. The negative results of a series of experiments with kainit, against the insects attacking the roots of the grape, caused considerable discussion, and the need for further experimentation along this line was pointed out.

A paper by A. H. Kirkland, on "Preparation and Use of Arsenate of Lead," detailed a method of preparing this insecticide at a cost of about seven cents per pound. Work against the Gypsy moth was mentioned, and the condition of the infested region was reported as generally better than that of last year. This undertaking, however, is still handicapped by insufficient financial support.

"A Malodorous Carabid," by Mr. Barrows, gave extensive notes on the annoyance and discomfort caused by the almost unbearable odour of this insect, *Nomius pygmaeus*.

At the final adjournment of the session it was voted to hold the next meeting at Boston, Mass., August 19th and 20th.

Several resolutions were passed, among which were (1) a resolution requesting the publication of the proceedings as a bulletin of the Division of Entomology, U. S. Dept. of Agriculture, and (2) expressing familiarity with the efforts of the State of Massachusetts to exterminate the Gypsy moth, and commending the results already accomplished.

The election of officers resulted as follows: President, Herbert Osborn, Ames, Iowa; 1st Vice-President, Lawrence Bruner, Lincoln, Neb.; 2nd Vice-President, C. P. Gillette, Ft. Collins, Colo.; Secretary and Treasurer, C. L. Marlatt, Washington, D. C.

A. H. KIRKLAND, Secretary *pro tem*.

A LIST OF THE COLEOPTERA OF THE SOUTHERN CALIFORNIA ISLANDS, WITH NOTES AND DESCRIPTIONS OF NEW SPECIES.

BY H. C. FALL, PASADENA, CAL.

Early in May of the present year (1897) the Pasadena Science Club sent three of its members on a month's general collecting trip to certain of the Santa Barbara islands lying off the coast of Southern California. While none of the members of the expedition were, strictly speaking, entomologists, a considerable experience in collecting, combined with some preliminary instruction, enabled them to devote intelligently a portion of their time to the collection of insects, more especially of the Coleoptera.

The islands visited were in the order named, Santa Barbara, San Nicolas, and San Clemente, distant respectively forty, sixty, and fifty miles from the nearest point on the mainland. Inasmuch as the entire material in Coleoptera, consisting of forty-six species and upward of one thousand specimens, has been submitted to me for study, it seems a fitting occasion for presenting as complete a list as possible of the coleopterological fauna of the entire group of islands, from Santa Cruz to Guadalupe.

To Eastern collectors it may seem a matter for wonderment that so interesting a field should so long remain, entomologically speaking, practically unexplored; yet it must be remembered that entomologists are here exceedingly few and far between, and the islands are, with the exception, for the past few years, of Catalina, nearly or quite uninhabited and not conveniently accessible. Every now and then, to be sure, an Eastern man appears with bottles and net, but to him the whole vast region is a terra incognita. Mountain and desert and valley offer opportunities without number; he takes the goods the gods provide and troubles not himself about possibilities in lands hull down in the Pacific. And so it happens that the few beetles recorded from the islands we owe to the kindness of one or another of the botanists or ornithologists who have at long intervals found their way there.

It is believed by those best competent to judge that these islands are the summits of a submerged mountain range forming a part of the mainland, or at least connected with it as a peninsula, until after the beginning of the Quaternary Period, when it was separated and broken

up into islands by subsidence. The close similarity between the flora and fauna of Guadalupe and California has several times been cited in support of this view and seems in itself almost conclusive.

As far as I can learn from the literature at hand, the following fifteen species of Coleoptera are all that were described or reported from the islands up to 1875 :

From Santa Cruz—*Asaphes tumescens*, *Malthodes laticellis*, *Phobetus comatus*, *Ernobius debilis*, *Helops Bachei*; from Santa Catalina—*Pristoscelis punctipennis* and *P. pedalis*; from San Clemente—*Coniontis lata*, *Eusattus robustus*, *Eulabis grossa*, *Amara insularis*; from Santa Barbara—*Eleodes scabripennis*, *Cibdelis Bachei* and *Meloe barbara*. *Pristoscelis ænescens* is said to be "from the islands off Santa Barbara," and it is more than probable that the same reading should be applied to the three preceding species. Nearly if not all the above named species were taken either by C. M. Bache or Dr. J. G. Cooper and given to Dr. Leconte, by whom they were described (1861-1866), with the exception of *Amara insularis*, which was described by Dr. Horn in 1875.

In 1875, Dr. Edward Palmer brought from the Guadalupe Islands the following twenty-three species, which were enumerated by Dr. Horn, Trans. Am. Ent. Soc., V., 1876 :

Calosoma semilæve, Lec.	Trogosita virescens, Fab.
" Palmeri, Horn.	Saprinus lugens, Er.
Bembidium striola, Lec.	Cardiophorus luridipes, Cand.
Amara insignis, Dej.	Pristoscelis pedalis, Lec.
" californica, Dej.	Necrobia rufipes, Fab.
Platynus maculicollis, Dej.	Cænonycha socialis, Horn.
Calathus obscurus, Lec.	Atimia dorsalis, Lec.
Tachycellus nebulosus, Lec.	Cœlotaxis muricata, Horn.
Anisodactylus piceus, Mén.	" punctata, Horn.
Anisotarsus flebilis, Lec.	Conibius seriatus, Lec.
Necrophorus nigrita, Mann.	Helops Bachei, Lec., var.
Dermestes vulpinus, Fab.	

In an appendix to the annual report of the Chief of Engineers for 1876, Dr. Leconte gives a list of species taken in So. California the previous year by the expedition for geographical survey under Lieut. Geo. M. Wheeler, among which are the following seventeen species from the island of Santa Cruz :

Omophron dentatum, Lec.	Tropisternus californicus, Lec.
Bembidium transversale, Dej.	Hydrocharis glaucus, Lec.
Calathus ruficollis, Dej., var.	Carpophilus pallipennis, Say.
Platynus brunneomarginatus, Mann.	Polycaon Stoutii, Lec.
Pterostichus lætulus, Dej.	Phlecodes diabolicus, Lec.
Amara californica, Dej.	Coniontis viatica, Esch.
Anisodactylus consobrinus, Lec.	" subpubescens, Lec.
Hippodamia vittigera, Mann.	Cratidus osculans, Lec.
Dermestes talpinus, Mann.	

In 1892 — *Zoe*, Vol. III., p. 262 — Mr. F. A. Seavey gives a short list of insects taken by him on Santa Catalina in August of that year. This list includes fourteen species of Coleoptera, of which three — *Balaninus obtusus*, *Pristoscelis quadricollis* and *Anthonomus canus* — are quite surely incorrectly determined and will not be included in the following list.

During parts of July and August, 1892 and 1894, about four weeks in the aggregate was spent by the writer on Catalina. The island was then very dry and collecting was rather unremunerative. Nevertheless upward of one hundred species were added to previous records.

To these must be added more than thirty species out of seventy-five taken by Dr. Gustav Eisen on Santa Rosa during May of the present year; a few taken on Catalina by Dr. A. Fenyès, of Pasadena, at about the same time; and finally, about half of the forty-six species collected by the expedition alluded to at the beginning of this article. The material collected by them is of especial interest inasmuch as it is probable that no insects have before been brought from either Santa Barbara or San Nicolas—the most remote of all the islands of the Santa Barbara group—and but four beetles from San Clemente. The catch of Dr. Eisen on Santa Rosa is of nearly equal interest for similar reasons. The following abbreviations are used in the subjoined list:

B. Santa Barbara.	G. Guadalupe.
Ca. Santa Catalina.	N. San Nicolas.
Cl. San Clemente.	R. Santa Rosa.
Cz. Santa Cruz.	

* Species hitherto recorded from same island.

† Species not known to occur on mainland.

- Cicindela oregona*, Lec. R.
Omophron dentatum, Lec. Cz.* R.
Cychrus mimus, Horn. Ca.
Calosoma semilæve, Lec. G.* R.
† " *Palmeri*, Horn. G.*
Dyschirius gibbipennis, Lec. R.
Schizogenius depressus, Lec. Ca.
Bembidium transversale, Dej. Cz.
* R.
Bembidium striola, Lec. Ca. G.*
" *platynoides*, Haywd. R.
" *indistinctum*, Dej. R.
" *ephippiger*, Lec. R.
" *iridescens*, Lec. Ca.
Tachys vittiger, Lec. Ca.
" *sp. nov.?* Cl.
Pterostichus Isabelkæ, Lec. Ca. Cl.
" *Menetriesii*, Mots. R.
" *hetulus*, Lec. Cz.* R.
" *sp. indet.* R.
Amara insignis, Dej. G.* Ca.* R.
† " *insularis*, Horn. Cl.* N. B.
" *californica*, Dej. G.* Cz.* R.
Calathus ruficollis, Dej. Ca. Cz.*
" *obscurus*, Lec. G.* R.?
Platynus brunneomarginatus, Mann.
Ca.* Cz.* R.
Platynus funebris, Lec. Ca.
" *maculicollis*, Dej. G.* R.
" *variolatus*, Lec. Ca.
Brachynus carinulatus, Mots.? Ca.
Chlænienus obsoletus, Lec. Ca.
Agonoderus lineola, Fab. R.
Stenolophus limbalis, Lec. Ca.
Bradycellus rupestris, Say. Ca.
" *californicus*, Lec. R.
Tachycellus nebulosus, Lec. G.*
" *nitidus*, Dej. Ca. R.
- Anisodactylus dilatatus*, Dej. R.
" *piceus*, Mén. G.* R.
Anisodactylus consobrinus, Lec.
Ca. Cz.* R.
Anisodactylus californicus, Dej.
Ca. R.
Anisotarsus flebilis, Lec. G.*
Deronectes striatellus, Lec. R.
Hydroporus vilis, Lec. Ca. R.
Agabinus glabrellus, Mots. Ca.
Agabus lugens, Lec. R.
Ochthebius discretus, Lec. Ca.
Tropisternus ellipticus, Lec. Ca.
Tropisternus californicus, Lec. Ca.
* Cz.*
Hydrocharis glaucus, Lec. Cz.* R.
Chætarthria nigrella, Lec. Ca.
Laccophilus ellipticus, Lec. Ca. R.
Cymbiodyta dorsalis, Mots. Ca. R.
Cercyon luniger, Mann. Ca.
Necrophorus guttula, Mots. Cl.
Necrophorus nigrinus, Mann. G.*
Cl. R.
Silpha ramosa, Say. R.
" *lapponica*, Hbst. R.
Aleochara bimaculata, Grav. Ca. Cl.
" *sulcicollis*, Mann. R.
Polistoma arenaria, Csy. Ca. B.
Heterothops californicus, Lec. Ca.
Creophilus villosus, Grav. Ca. Cl.
Hadrotus crassus, Mann. R.
Philonthus longicornis, Steph. Ca.
" *nigrinulus*, Grav. Ca.
" *Lecontei*, Horn. R.
Actobius puncticeps, Horn. Ca.
Cafius canescens, Mann. N.
" *lithocharinus*, Lec. R.
" *luteipennis*, Horn. R.

- Cafius sulcicollis*, Lec. R.
 " *opacus*, Lec. Ca.
Iathrobium jacobinum, Lec. R.
Caloderma reductum, Csy. Ca.
 " *mobile*, Csy. Ca.
 " sp. Ca.
Tachyporus californicus, Horn. Ca. R.
Pseudopsis, sp. Ca.
Haploderus flavipennis, Csy. Ca.
Apocellus analis, Lec. Ca.
Hippodamia vittigera, Mann. Cz.*
Hippodamia ambigua, Lec. Ca.*
 Cl. R.
Hippodamia convergens, Guér. Ca.*
Coccinella, v. *californica*, Mann. Ca. Cl. N. R.
Cycloneda oculata, Fab. Ca.
 " *sanguinea*, Linn. Ca.*
Psyllobora, v. *tædata*, Lec. Ca.*
Chilocorus bivulnerus, Muls. Ca.*
Cryptognatha catalinæ, Horn. Ca. Cl.
Hyperaspis lateralis, Muls. Ca.*
Scymnus guttulatus, Lec. Ca.
 " *nebulosus*, Lec. Ca.
 " *cervicalis*, Muls. Ca.
 " *marginicollis*, Mann. Ca.
 " *ardelio*, Horn. Ca. Cl.
Cephaloscymnus occidentalis, Horn. Ca.
Cephaloscymnus ornatus, Horn. Ca.
Rhizobius lophanthæ, Blaisd. Cl.
Aphorista morosa, Lec. R.
Cryptophagus, sp. Ca. Cl.
Atomaria, sp. R.
Dermestes marmoratus, Say. Ca. Cl. N. R.
Dermestes Mannerheimii, Lec. Cl. N. B. R.
Dermestes talpinus, Mann. Cz.*
 " *tristis*, n., sp. R.
 " *vulpinus*, Fab. G.*
Trogoderma sternale, Jayne. Ca.
Hololepta vicina, Lec. Ca.
Saprinus interstitialis, Lec. Ca.
 " *lugens*, Er. Cl. N. B. G.* R.
 " *fimbriatus*, Lec. Ca.
 " *vitiosus*, Lec. Ca.*
 " *lubricus*, Lec. Ca. Cl. R.
 " sp. near *laridus*. Ca.
Cercus sericans, Lec. Ca.
Carpophilus pallipennis, Say. Ca.* Cz.* Cl.
Coninomus fulvipennis, Mann. Ca.
Corticaria distinguenda, Com. Ca. Cl.
Corticaria, sp. Ca.
Trogosita virescens, Fab. G.*
Dryops productus, Lec. Ca.
Cardiophorus luridipes, Cand. G.*
Melanotus variolatus, Lec. Ca.
Asaphes tumescens, Lec. Cz.*
Acmæodera connexa, Lec. R.
Telephorus notatus, Mann., var. Ca.
Malthodes laticollis, Lec. Cz.*
Collops cribrosus, Lec. R.
Endeodes abdominalis, Lec. Ca.
 † " sp. Ca.
 " sp. R.
Malachius, sp. nov.? R.
 † *Attalus subfasciatus*, n. sp. Cl.
Pristoscelis ænescens, Lec. B.* R.
 " *punctipennis*, Lec. Ca.*
Pristoscelis pedalis, Lec. Ca.* G.* Cl.

- Listrus*, sp. Cl. R.
 † *Dasytes*, sp. nov. Ca.
 † " sp. nov. Cl.
Eschatocrepis constrictus, Lec. Ca.
Cymatodera ovipennis, Lec. Ca.
 " *angustata*, Spin. R.
Necrobia rufipes, Fab. G. * Ca.
 Cl. R.
Necrobia ruficollis, Fab. Cl.
 † *Ernobius debilis*, Lec. Cz. *
 † *Oligomerus*? n. sp. Ca.
Trypopytis tenuilineata, Horn. Ca.
Hemiptychus obsoletus, Lec.? Ca.
Euceratocerus Hornii, Lec. Ca.
Sinoxylon declive, Lec. N.
Polycaon Stoutii, Lec. Cz. *
Cis, sp. Ca.
Cœnonycha rotundata, Lec. Ca.
 † " *socialis*, Horn. G. *
Phobetus comatus, Lec. Ca. Cz. * R.
Cyclocephala villosa, Burm. Ca.
Phymatodes juglandis, Leng? R.
Oeme gracilis, Lec. Ca.
Romaleum simplicicolle, Hald. Ca.
Megobrium Edwardsii, Lec. R. *
Xylotrechus oblitteratus, Lec. Ca.
Atimia dorsalis, Lec. G. *
Ipochus fasciatus, Lec. Ca.
Pachybrachys, sp. Ca.
 " sp. Ca.
Diachus auratus, Fab. Ca. Cl. R.
 † *Colaspidea subvittata*, n. sp. Ca. Cl.
Diabrotica soror, Lec. Ca. *
Monoxia puncticollis, Say. R.
Phyllotreta pusilla, Horn. Ca.
Bruchus pauperculus, Lec. Ca.
Eurymetopon convexicolle, Lec. Ca.
Phlœodes diabolicus, Lec. Cz. *
- Nyctoporis carinata*, Lec. Ca. R.
Coniontis elliptica, Csy. Ca. R.
 † " *lata*, Lec. Cl. * B. R.
 † *Coniontis lata*, var. *insularis*, Csy.
 Cz. * R.
Coniontis viatica, Lec. Cz. *
Coniontis subpubescens, Lec. Ca.
 Cz. *
 † *Cœlotaxis punctulata*, Horn. G. *
 † " *muricata*, Horn. G. *
 † " *angustula*, Csy. G. *
 † *Cœlus pacificus*, n. sp. N. R.
 † " *remotus*, n. sp. Cl.
 † *Eusattus robustus*, Lec. Cl. *
 " *politus*, Horn. R.
Eleodes quadricollis Esch. Ca.
 " *dentipes*, Esch. Cl. N. R.
 " *scabripennis*, Lec. B. * R.
 † *Eulabis grossa*, Lec. Cl. * N. B.
 " *pubescens*, Lec. Ca.
 " *obscura*, Lec. R.
Amphidora littoralis, Esch. Ca. R.
Cratidus osculans, Lec. Cz. * R.
Cibdelis Bachei, Lec. B. *
Blapstinus rufipes, Csy. Ca.
 " *brevicollis*, Lec.? R.
Conibius seriatus, Lec. G. *
Notibius sulcatus, Lec. Cl.
 † *Helops Bachei*, Lec. R.
 † " " var. G. *
 " sp. Ca.
Hymenorus infuscatus, Csy. Ca.
Isomira variabilis, Horn. Cl.
Pentaria nubila, Lec. Ca.
Anaspis collaris, Lec. Ca.
Mordellistena, sp. Ca.
 " sp. Ca.
Notoxus constrictus, Csy. Ca.

R.	<i>Anthicus californicus</i> , Laf. Ca. Cl.	<i>Apion antennatum</i> , Sm. Ca.
	" sp. Ca. Cl.	" <i>cedorhynchum</i> , Lec. Ca.
	† <i>Meloe barbara</i> , Lec. B. *	<i>Cleonus basalis</i> , n. sp. Cl.
y.	" sp. Ca.	<i>Smicronyx</i> , sp. R.
	<i>Rhynchites aureus</i> , Lec. Cl.	<i>Anthonomus pauperculus</i> , Lec. Ca.
	" sp. nov.? Ca.	<i>Tychius</i> , n. sp. N.
a.	<i>Trigonoscuta pilosa</i> , Mots. Cl. R.	<i>Balaninus occidentis</i> , Csy. Ca.
	<i>Sciopithes setosus</i> , Csy. var. Cl.	<i>Sphenophorus vomerinus</i> , Lec. R.

Concerning the value of certain names upon which there is a disagreement among authorities I am unable to offer any very well founded opinion. I am, however, inclined to doubt the validity of *Cryptognatha catalinae*, Horn, and *Cœlotaxis angustula*, Casey; and on the other hand it seems probable that *Conibius guadalupensis*, Casey, is a good species and not a form of *seriatus* as recorded by Dr. Horn.

Tachys, sp. —Two specimens from Clemente are closely allied to *varax*, Lec., but seem distinct by the obviously less transverse thorax.

Amera insularis, Horn.—Very abundant on all the islands visited by the Pasadena party. I saw no signs of it on Catalina in midsummer, though the dried remains of *insignis* were common enough.

Agabinus glabrellus, Mots.—Not rare on Catalina. Very scarce on the mainland in the streams in the mountain canons.

Cercyon luniger, Mann.—A small number found in decaying seaweed on Catalina; *fimbriatum*, which may be found by thousands along the opposite coast, has not yet been detected.

Hippodamia ambigua, Lec.—Specimens from Santa Rosa might with equal propriety be placed with *convergens*. Unless some other character than thoracic markings can be discovered to separate these two so-called species they cannot be held as distinct. They constantly occur together everywhere in South California, and intermediate forms are frequent.

Rhizobius lophanthus.—It is certain that this beetle is an importation from Australia, but it seems very probable that the pioneers were not introduced as advertised. How it first got here is a mystery, but it is sure here to stay, and is now quite as much at home as any of our native Scymni. Although already widely distributed in California, its occurrence on an island so distant and so rarely visited as San Clemente was, to say the least, unexpected.

Aphorista morosa.—According to Mr. Ricksecker this and *lata* are

sexes of the same species, the latter being the female. *Morosa* is in my experience much more commonly met with in So. California than *lela*.

Endocodes.—The species of this genus are among the most curious of the Coleoptera inhabiting the California sea beaches. They are to be found most frequently in April and May running about on the sand, or concealed under rubbish or driftwood so common in such situations. The two undetermined species are represented by one specimen each. That from Catalina was taken by me in July, and is quite surely nondescript, differing from our described species by the very minute elytra, as well as in coloration. The Santa Rosa example is almost entirely black, and is possibly a colour variety of *collaris*.

Phobetus comatus.—There is a very confusing amount of variation exhibited by specimens of this species from various localities in the State. Specimens taken by myself on Catalina, of small size, subimpunctate thorax with hind angles entirely wanting, seem quite distinct when compared with a series from Fresno county, of larger size, different colour, rather closely punctate thorax with distinct hind angles. I have, however, seen intermediate forms, and it would be unsafe to make a division without a large series from diverse localities. The name *testaceus* was originally given by Leconte to specimens from Santa Cruz Island, and it may possibly have to be revived.

Xylotrechus obliteratus.—A fine series of this beautiful longicorn was taken by Dr. Fenyes on Catalina. All the specimens found were males, the females being indeed very rarely taken. The species occurs on willows.

Ipochus fasciatus.—This occurs rather plentifully on Catalina under the bark and on the branches of dead *Rhus laurina* (or *R. integrifolia*). The form, size, sculpture and markings vary greatly, often in a series taken from the same tree.

Balaninus occidentis, Casey.—This species has heretofore been confounded with *uniformis*, but is abundantly distinct. It is common enough on Catalina, but much less so on the mainland, frequenting several species of oaks.

A certain small species taken on Santa Catalina by myself in 1894 and again found on Clemente this year, has not been included in the list for the simple reason that its affinities are not yet sufficiently clear to admit of placing it even in a family sense. Two of our specialists to whom specimens have been sent have ventured opinions that are quite at variance; the case is therefore postponed for further hearing.

It is not unlikely that a few species have been overlooked in the preparation of the preceding list, but it is hoped that any such omission may not seriously impair its usefulness as a foundation on which to base any future reports on the Coleoptera of these islands.

It need scarcely be said that the 226 species enumerated here can represent but a fraction of the entire coleopterological fauna.

The following species, it is believed, are now made known for the first time. There are surely a number of other undescribed species, but their description would involve far more study than can now be devoted to them.

Calus pacificus, n sp.—Broadly oblong, elliptical, moderately convex, piceous black, surface polished. Epistoma broadly sinuate, antennæ with three-jointed club. Prothorax equal in width to the elytra, a little more than twice as wide as the length at the middle, widest immediately before the base, sides rather feebly arcuate and strongly convergent, moderately densely evenly punctate throughout. Elytra twice as long as the thorax along the median line, not longer than wide, equally densely but more finely punctate than the thorax, the punctures not in the least asperate on the disk, and only very feebly so on the declivity and along the margin. Process of first tarsal joint extending under the next three.

Length, 7 mm.; width, 5 mm.

Very distinct from any of our described species by the conspicuously long prothorax, and from all but the next in the almost entire lack of elytral asperities. The marginal fringe of hairs on the prothorax is noticeably shorter and finer than in any of our mainland species. Described from a single example of unknown sex taken on San Nicolas, May 24. Since the above description was written I have seen numerous examples in the material collected by Dr. Eisen on Santa Rosa. With the exception of some variation in size these differ in no noteworthy respect from the San Nicolas type.

Calus remotus, n sp.—Very convex, piceous black, legs and elytra brown. Epistoma broadly sinuate, antennal club four-jointed. Prothorax similar in outline to *pacificus*, but shorter; surface subopaque, densely coarsely punctate. Elytra shining, densely finely punctate, without trace of asperities. Process of first tarsal joint extending beneath the next two.

Length, 6.5-7 mm.; width, 4-4.5 mm.

The above brief description is sufficient to characterize this some-

what remarkable species, of which a single pair was taken (June 3) on San Clemente.

The marginal fringe is longer than in *pacificus*, but thinner than usual.

Both the above described species were found under rubbish at a distance from the shore, and have probably the habits of *Coniontis* and *Celotaxis* rather than those of the other members of the genus. This might indeed be safely inferred from the less developed marginal hairs and lack of elytral asperities, which have an undoubted connection with the habits possessed by the mainland species of burrowing in loose sand. Whether we have here a change from the ancestral mode of life, due to a change of environment, or whether, as seems to me more likely, the burrowing habit is of recent development and the island species are the surviving representatives of an earlier type, is an interesting question.

Cleonus basalis, n. sp. — Moderately stout, integuments black, polished. Beak three-fourths as long as the prothorax, not dilated at tip, rather thinly clothed above and beneath with short cinereous hairs, sides glabrous, above subcarinate in basal two-thirds, rather coarsely punctate throughout. Prothorax as long as wide, sides very slightly convergent, apex feebly constricted, basal lobe angulate, surface very closely densely punctate, feebly carinate in apical half, deeply excavate behind. Vestiture condensed in four narrow vittæ; the two dorsal approximate in front, posteriorly divergent and incomplete; the lateral vittæ dislocated at the apical constriction. Elytra barely twice as long as wide, humeri rounded, tips separately rounded and scarcely acuminate; striæ composed of large, closely-placed punctures; intervals scarcely wider than the punctures, especially on the disk; base strongly impressed each side, leaving the base of the third and to a less degree that of the sixth interval strongly tumid. The third, fourth, fifth and outer three intervals are so thinly clothed as to appear glabrous; the first is, however, very finely pubescent throughout, as is the seventh behind the middle. The dark areas contain a few small spots of condensed hairs, and there is a larger conspicuous spot at the base of the second interval. Lower surface and legs as usual. The third joint of hind tarsi is small, but obviously wider than the second.

Length, 10 mm.; width, 3.5 mm.

Hab.—San Clemente.

The single male above described must evidently be placed near

quadrilineatus by Casey's table — Coleop. Not., III., p. 186 — but the deep basal excavations of the thorax and elytra, as well as the dense punctuation of the former, clearly separate them. The ocular lobes are moderately well developed in *basalis*, and are said to be wanting in *quadrilineatus*.

Attalus subsfasciatus, n. sp. — Very small, narrow, depressed, black, thorax with sides behind and base narrowly testaceous, elytra with a slightly antemedian pale fascia which is interrupted at the suture. Head broad, antennæ slender, not in the least serrate, reaching the middle of the elytra (♀), or as long as the entire body (♂), the four basal joints pale. Thorax narrowed behind, of the same form as in *Endeodes*. Elytra parallel (♂), or posteriorly dilated (♀). The pubescence consists as usual of very short semi-erect hairs, with longer erect darker hairs sparsely placed.

Length, 1.5–2 mm.

Hab. — San Clemente.

Described from one ♂ and eight ♀s. A very peculiar little species, differing in antennal structure, form of thorax and style of elytral coloration from all other species in our fauna. It may for the present be placed next to *lobulatus* in which there is a faint indication of the present form of thorax.

Colaspidea subvittata, n. sp. — Piceous, with more or less distinct greenish-bronze lustre; legs, more especially tibiæ and tarsi, rufescent. Sides of prothorax not strongly rounded, punctuation moderately close, a little coarser on the elytra. Pubescence long (for the genus), recumbent, distinctly subvittate on the elytra in fresh examples. Length, 3.5–4.5 mm. Found abundantly by me on Catalina, also brought from Clemente. There is practically no variation except in size in the large number of specimens examined. The mainland species, on the contrary, exhibit a bewildering amount of variation in size, colour, punctuation, and even in form. One variety of varicolor is of nearly the same colour, but the pubescence is erect and the thorax more strongly rounded at the sides. The pubescence is much more easily removable in *subvittata* than in any of the other species, and the vittate arrangement is scarcely evident except in very fresh examples. In the males the antennæ are somewhat longer and all the tarsi moderately dilated — characters common to all the species of the genus.

Dermestes tristis, n. sp.—Length, .22-.26 inch. Elongate convex, parallel, black, clothed above with black pubescence, with a sprinkling of paler hairs on the prothorax, and rarely mottled with cinereous hairs on the elytra. Scutellum densely clothed with ochreous hairs, usually forming the only relief to the sombre aspect of the upper surface. Thorax not very obtusely rounded in front, anterior portion of lateral margin invisible from above, sides uniformly rounded, slightly sinuate before the front angles, which are distinct and only slightly obtuse. Surface of thorax densely, more coarsely punctate than usual. Beneath clothed as usual with dense white pubescence, with lateral series of black spots; prevailing colour of last ventral whitish; legs annulated with white. Males with median pits on third and fourth ventrals, tarsi clothed beneath with spinous hairs. Occurs in various parts of maritime So. California, and on Santa Rosa Island.

One of our smallest species, perhaps most nearly resembling *talpinus*. The latter is, however, more robust; with ochreous and gray mottlings on the elytra, sides of thorax more strongly rounded near the base, and pubescent male tarsi.

It seems not to have been noticed that in a considerable number of our species of *Dermestes* the front and middle tarsi of the male are rather densely pubescent beneath. The character is an important one and enables us to establish the distinctness of *Mannerheimii*, which has never looked right as a variety of *marmoratus*. These last named species may then be thus compared:

MARMORATUS.—Size large (.40-.45 in.), elytra mottled with ochreous and cinereous hairs, tarsi spinous beneath in both sexes.

MANNERHEIMII.—Size smaller (.24-.32 in.), elytra mottled with cinereous only, front and middle tarsi (♂) pubescent beneath.

HEPIALUS QUADRIGUTTATUS, Grote.—This large salmon-pink variety was taken this year near Metis, P. Q. Messrs. L. Reford and E. Brainerd, of Montreal, chanced one day to pick up the wing of a specimen on a little dry area in a swamp several miles from Metis. They returned to the village for a lantern, and then tramped back again. Their industry was rewarded by the capture of two specimens. They saw five others, and report that the moths appeared about nine o'clock p.m., and flew in a zigzag horizontally, not up and down like *H. thule*. This species has been taken in Ontario by Mr. Elcome, at Peterborough, and at Roach's Point, Lake Simcoe.

LEDRA PERDITA vs. CENTRUCHUS LIEBECKII.

BY F. W. GODING, M. D., PH. D., RUTLAND, ILL.

In the February CANADIAN ENTOMOLOGIST, page 38, Prof. C. F. Baker contributes an article on *Ledra perdita*, A. and S., in which he attempts to identify the insect described by Amyot and Serville under that name with my *Centruchus Liebeckii*. Those authors describe their species from an admittedly inaccurate figure, the original type having been destroyed. They state that their species is from Northern America. [See note.] Van Duzee states (fide Baker) that *perdita* is from Pennsylvania, on what authority I do not know, and Prof. Baker decides that because Van Duzee gives that State as the habitat of the insect, and my species having been described from the same commonwealth, they must be identical. As there is no proof beyond the dictum of Van Duzee that *Ledra perdita* is from Pennsylvania that point may be dropped until we hear further from him. He is too careful a student of our Homoptera to be guilty of confusing a Membracid with a *Ledra*. The facts regarding Fitch's identification are these: While in Washington a few years ago, and working over the Fitch material, I found an example of *Liebeckii* labeled in Fitch's handwriting, "*Ledra perdita*, A. and S.," and "*capra*, Mels.," both names being on the label, which I recorded in the CANADIAN ENTOMOLOGIST, Vol. XXV., p. 172. Fitch never published his opinion regarding this species. Prof. Baker (l. c.) says: "So peculiar in form is it that there is not a possibility of confusing it with anything else in our fauna." Since that was written he has come into possession of a copy of Fowler's great work on the Membracidae of Mexico and Central America, and I do not doubt that since he has examined Fowler's figure of *Centruchoides laticornis* his opinion has undergone a change, for the figure of *perdita* certainly resembles that figure as closely as it would a figure of *Liebeckii*. The same is true with several others of the Centrotinae, viz., *callicentrus*, etc., etc., from "Northern America."

NOTE.—I do not know where Mr. Van Duzee publishes my reference to this species beyond a note in his catalogue of the Jassidae, wherein he says: "One American species of *Ledra* has been described, but I have not yet seen an example." Doubtless he here refers to Amyot and Serville's species.

Now, regarding *Microcentrus caryæ*, Fitch, and *Centruchus Liebeckii* being congeneric, at the time I wrote the description of *Liebeckii* the close relationship between my species and *caryæ* was recognized, but as Stal says that prothoracic horns are absent in *Microcentrus*, I looked for some other modern genus in which to locate, temporarily, the species. The Old World genus *Centruchus* seemed to fit it the best, and that generic term was used although there was an extra discoidal cell which must sooner or later place it in a separate genus. This has been done by Fowler, who has described the genus *Centruchoides*. Of the two species the neuration is identical, and the entire anatomy (other than the presence of lateral horns in *Liebeckii*) is the same. I have before me the example of *Liebeckii* mentioned by Prof. Baker as having aborted horns. In my collection is an example with horns still more aborted, and while in Washington a few weeks ago I found several similar examples in Mr. Heidemann's collection. That gentleman informed me that he had taken both forms together, with their larvæ and pupæ, while collecting. This shows that the horns are variable, and, as I believe, in some cases absent, as is true of *Platycotis sagittata*, Germ., as recorded in my paper "Fitch's types."

Mr. Fowler has re-described the genus *Microcentrus* as *Phaulocentrus*, and after stating that *caryæ*, Fh., belongs to his genus, describes and figures four new species, viz.: *pilatus*, *proximus*, *sordidus* and *cornutus*; the first three closely related to *caryæ*; the fourth, I believe, bears the same relation to one of the others that *Liebeckii* bears to *caryæ*, and I should not be surprised if his **Centruchoides laticornis* was still another instance.

In conclusion, I will say that the name *Ledra perditæ*, in my opinion, should be forgotten. The type was destroyed; the description, which might apply to any one of a dozen species of *Centrotinæ*, drawn up from an unrecognizable figure, and there is no possible way of determining what insect the artist had in hand when he drew the figure from which Amyot and Serville drew up the description of *perditæ*. Let the name be buried in oblivion. I believe *caryæ*, Fitch, and *Liebeckii*, Goding, are one and the same species. As Fitch's name has priority, the name *Microcentrus caryæ*, Fh., should stand, while the horned form may be known as *var. Liebeckii*, Godg.

* *Centruchoides* is not a MS. name. It is described in Fowler's work, page 159.

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A PRINCIPLE TO OBSERVE IN NAMING GALLS: TWO
NEW GALL-MAKING DIPTERA.

BY WM. H. PATTON, HARTFORD, CONN.

(*EDASPIS-SOLIDAGO ATRA*.)

Galls do not differ from those of *Æ. polita*, as described by Osten Sacken (Tr. A. E. Soc. ii., 301; 1869).

This is an addition to the list of gall-making Trypetas given by Osten Sacken in *Psyche* for April, 1880. I bred both sexes from *Solidago* galls, Sept. 8, 1875, in Connecticut.

Flies.—Female agrees perfectly with Loew's description of a specimen from New York. The eyes in the living flies are green, with two longitudinal purple stripes. The shed puparia are left in the galls, and are of a delicate texture and milk-white colour. The New York specimens from which *atra* was described approach *polita* in all their points of difference from the Mexican specimens. Whether the Mexican specimens belong to the same species is a question which does not concern us in determining the synonymy of *atra*. If the pale gray border of the wing cross-bands was darkened and one of the bristles on the lateral border of the front was lost (differences which might well arise with increased maturity of the specimens) we should have nothing to separate the species excepting the slightly greater divergency of the second and third bands, and it is probable that this greater divergency would disappear with the blackening of the gray borders. *Æ. atra* is a later name than *Æ. polita*.

CECIDOMYIA-CELTIS (new genus) *DESERTA*, new species.

Galls are hollow, elongate swellings of young twigs, from which emerge, about the first of June, single Cecidomyian flies from a perforation near the base. Length of gall one half inch to one inch.

On Hackberry (*Celtis occidentalis*); Orange, Connecticut.

The name describes the genus.

This gall I name and describe to illustrate a principle which may be useful in naming galls of which the makers are unknown. It does not seem proper to refer such galls to the genus of plants alone, as was done by the older botanists, nor to the genus of insects alone, as is at present the fashion, but to a combination of the two, thus: *Cynips-quercus*, *Cecidomyia-quercus*, *Cecidomyia-salix*, etc. All *Cynips* are, it is true, confined to *Quercus*, but it is the gall and not the insect for which I

propose this nomenclature; besides, *Quercus* supports other genera of gall-makers. The combined generic name is in the nominative case and will not conflict with the many specific names which have been drawn from the plant and used in the genitive. In many cases the genitive of the plant genus has been used in combination with a specific name not derived from the plant, as *Cynips-quercus-futilis*. The suggestion made by Osten Sacken that in these cases the genitive or its initial (which is often all that is used) should be dropped seems worthy of being carried into effect, as this genitive appears in most cases to have been inserted by accident or error.

This nomenclature also has the advantage of not presenting the appearance of describing what is unknown; it has no binding force of priority over the specific name of the insect when that is discovered. It has, however, a priority in the description of galls, and the specific name should be retained as the name of the gall, even though the insect should by chance receive a different name or it should prove not to belong to the genus under which the gall is described. It also has the advantages of simplicity and of conformity with medical usage in naming gall diseases of animals.

To exemplify the principle I name the following galls described in the 5th Rept. U. S. Ent. Comm :

- p. 612, 30, *C.-c. oviformis*.
- p. 613, 31, *C.-c. semenrumicis*.
- p. 613, 32, *C.-c. pubescens*.
- p. 613, 33, *C.-c. capsularis*.
- p. 614, 34, *C.-c. spiniformis*.

THYREOPUS ADVENUS (Sm.), PACK., A PROTECTOR OF THE ARMY WORM.—This species is an exception among burrowing wasps in being injurious to vegetation, as I have found it killing and carrying to its nest *Sarcophaga*, *Musca domestica*, and that enemy of the Army worm, *Belvosia unifasciata*. The wasp forms its small hillocks under the shelter of shade trees late in August, in Connecticut. In rainy summers its numbers are much reduced. *Miltogramma* pursues the wasp with felonious intent. The wasp may be destroyed by pouring strong alkaline washes into the burrows.

The *B. unifasciata* varies in having a red tail, contrary to the name *flavicauda* by which it was formerly known. W. H. PATTON.