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Canadian Entomologist

VOLUME XLII.

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EDITED BY

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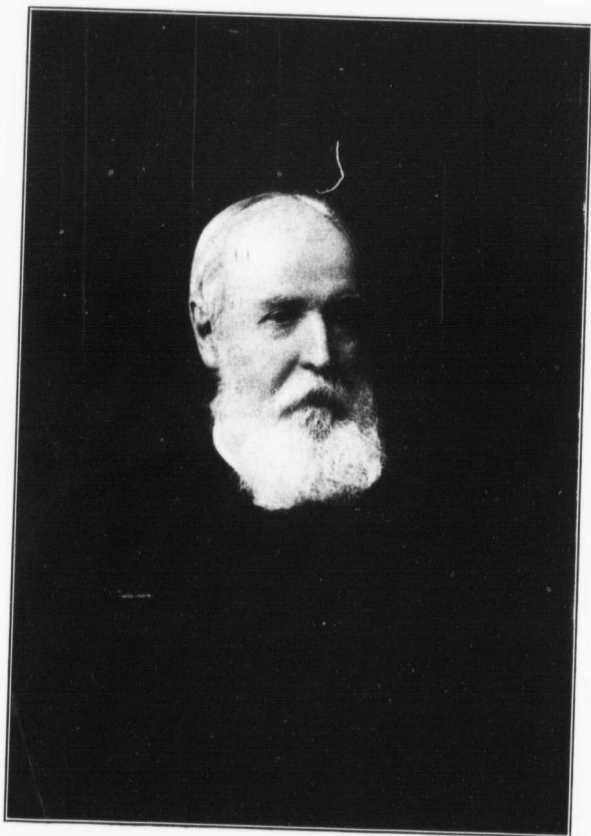
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THE REV. CHARLES J. S. BETHUNE.

The Canadian Entomologist.

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No. 1.

VALEDICTORY.

More than forty years ago, in August, 1868, the Editor put forth the first number of the *CANADIAN ENTOMOLOGIST*, a modest venture of eight pages. The same Editor last month brought to completion the 41st volume of this periodical. He has not, however, been continuously carrying on this work during all those years. After the publication of the first five volumes he was succeeded by his friend, Dr. William Saunders, of London, who edited the magazine for the next thirteen years. In 1886 Dr. Saunders was appointed Director of the Experimental Farms of the Dominion, and found his time so fully employed that he requested Dr. Bethune to take his place and become Editor once more. Thirteen of the forty-one volumes have thus been edited by Dr. Saunders, and twenty-eight by Dr. Bethune.

It is now necessary to make a change and transfer the charge of the magazine to younger hands. The weight of advancing years and the disability occasioned by impaired eyesight have led the long-time Editor to ask for relief, and to shift the burden of responsibility to other shoulders. It is with much reluctance that he gives up this labour of love and ceases to correspond with his widely-scattered contributors, to whose kindness and ability the success of the magazine has been so largely due. To say good-bye to old friends is a painful duty, and to give up work because one has become too old for its proper accomplishment is perhaps more painful still. But time is inexorable; there is no escape from the changes it brings, and so it becomes a paramount necessity to make way for the younger men, to pass on into their vigorous hands the torch of science which one can no longer hold on high.

Happily a worthy successor is available, and the announcement is made with much gratification that Dr. E. M. Walker, Lecturer in Biology at the University of Toronto, has accepted the position of Editor of the *CANADIAN ENTOMOLOGIST*. Dr. Walker's name is widely known in scientific circles through the admirable work that he has accomplished in the Orthoptera and Odonata, to which orders he has especially directed his attention. It is earnestly hoped that the many friends of the Editor who now retires will be as considerate, as kind, and as generous to the

new incumbent of the office as they have so long been in the past. Long may the CANADIAN ENTOMOLOGIST continue to flourish, and long may Dr. Walker be enabled to preside over its destinies.

All communications for the CANADIAN ENTOMOLOGIST, books for review, etc., should be addressed to the Editor,

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University of Toronto, Toronto.

All business matters connected with the Society or the magazine, such as advertisements, subscriptions, etc., should continue to be addressed to the

Entomological Society of Ontario,
Guelph, Canada.

THE REV. CHARLES JAMES STEWART BETHUNE, M.A.,
D.C.L., F.R.S.C.

The many readers of the CANADIAN ENTOMOLOGIST will be glad to again see a portrait of the talented editor, who has with such conspicuous ability filled the editorial chair for so many years, but will greatly regret to learn that through failing eyesight he has found it necessary to retire from the editorship, and will be succeeded by Dr. E. M. Walker, of Toronto, the Vice-President of the Society.

Dr. Bethune was the third son of the Right-Reverend Dr. A. N. Bethune, the second Anglican Bishop of Toronto, and was born at West Flamboro', Ont, Aug. 11, 1838, and is, therefore, in his 72nd year. He was educated first at private schools, and afterwards at Upper Canada College, where he was head boy in 1856. He matriculated at Trinity College, Toronto, in the same year, winning the First Divinity scholarship, and the Wellington scholarship in 1857, and graduating in 1859 with first-class honours in classics, as well as standing high in mathematics and winning the Jubilee scholarship. He was ordained deacon in 1861 and by the late Bishop Strachan, and advanced to the priesthood in 1862, and became curate of St. Peter's, Cobourg, and afterwards of Carlton, Selby, Yorkshire. Returning to Canada, he was appointed incumbent of the Credit Mission, which he held from 1866-70, and was then appointed to the head mastership of Trinity College School at Port Hope, Ont., which position he held up to the summer of 1899, when he resigned and moved to London, Ont. In 1906 he accepted the appointment of Professor of Entomology and Zoology at the Ontario Agricultural College at Guelph.

Dr. Bethune early identified himself with the Entomological Society of Canada, as it was at first called, which had been organized in April, 1863, under the presidency of Prof. Croft, of Toronto, with Mr. William Saunders, of London, as Secretary-Treasurer.

In 1868 the Society began the issue of the CANADIAN ENTOMOLOGIST, the first number being dated August 1st, and was edited by Dr. Bethune, who at that time held the position of Secretary-Treasurer of the Society.

Of the 41 volumes which have been issued, Dr. Bethune edited all but thirteen, viz.: From the beginning up to the 9th number of Vol. V, and from the 10th number of Vol. XVIII to the present time.

Of the high standard at which he maintained the magazine it is not necessary to speak, as it has been universally acknowledged, but emphasis may be laid on the fact that with the exception of the few years in which he was living in London, the work had to be done in the intervals of an extremely busy life, as the Head Master of a large public school, which laid a heavy load of responsibility upon his shoulders, and more lately as Professor in a great agricultural college. In addition to editing the CANADIAN ENTOMOLOGIST, he edited for a considerable period the entomological department of the Canadian Farmer and the Weekly Globe, as well as the Annual Reports of the Entomological Society.

In 1883 he received the degree of D.C.L. from his alma mater, and in 1892 was elected a Fellow of the Royal Society of Canada.

To those who enjoy the privilege of knowing him, it is unnecessary to speak of his charming personality, his refined and cultivated mind and the great courtesy which have won him the warm regard and, indeed, affection of his host of friends. The positions which he has held in the Church, in the educational and scientific worlds have been many, and he has filled them all with distinguished ability. Though he has passed the three score years and ten, his lithe and upright carriage give the appearance of a much younger man, and all his friends will unite in hoping that the relief from editorial duties will be of great benefit to him, and that he may be spared for many years yet to his family and friends, and to the Entomological Society, which owes him so much.

H. H. L.

All readers of the CANADIAN ENTOMOLOGIST will note with pleasure that the Rev. Charles J. S. Bethune, who has found it necessary to retire from active editorial work, has been appointed Editor Emeritus of that journal by the Executive of the Entomological Society of Ontario.

NEW SILPHIDÆ OF THE TRIBE ANISOTOMINI.

BY H. C. FALL, PASADENA, CALIF.

There has recently come to hand from Mr. W. S. Blatchley, of Indianapolis, a small Silphide, which he recognized as new and which he desires that I should describe in order that it may be included in its proper place in his forthcoming descriptive catalogue of the Coleoptera of Indiana. The insect has much the appearance of an *Anisotoma*, and was so taken to be by both Mr. Blatchley and myself until more closely examined. It proves to be rather closely related to *Liodes*, but the difference in form, general facies, and certain structural characters, seem to require that it be made the type of a new genus, which is briefly characterized below. Opportunity is taken to describe at this time several new species of *Anisotoma* in my own collection.

STETHOLIODES, new genus.

Form oblong-elliptical, subdepressed; elytra with nine regular punctured striæ, the outer one distant from the margin. Labrum arcuate in front, with a small, shallow median emargination. Clypeus with narrow membranous border, the frontal suture completely lacking, the lateral frontal impressions feebly indicated. Prosternum as long before the coxæ as the thickness of the latter from front to back; mesosternum strongly oblique; other characters nearly as in *Liodes*.

Stetholiodes laticollis, n. sp.—Oblong-elliptical, subdepressed, rufo-testaceous, shining. Antennæ reaching the hind angles of the prothorax; third joint as long as the three following, fourth slightly longer than wide, sixth a little transverse, seventh larger, eighth similar to the sixth, but a little shorter, ninth to eleventh much larger, the eleventh longer than wide, and nearly as long as the two preceding together. Eyes small, feebly convex. Head half as wide as the prothorax, sparsely, evenly punctulate. Prothorax about twice as wide as long, a little wider than the elytra, sides broadly arcuate and gradually narrowed from the base; base angles subrectangular with rounded vertices; surface very minutely alutaceous and sparsely punctulate. Elytra more than twice as long as the prothorax, nearly one-fourth longer than wide, with nine striæ of punctures, the sutural stria impressed in apical half; stria punctures separated by their own diameters or a little less; intervals nearly flat and sparsely, irregularly punctulate, the sutural interval not narrower. Metasternum and abdomen alutaceous, the former distinctly punctate, except posteriorly, the latter more sparsely punctate. Length, 2.7 mm.; width, 1.6 mm.

January, 1910

Male.—Tarsal joints 5.5-4; front and middle tarsi dilated; middle and hind femora with a small denticle on the lower edge one-third from the knee; metasternum with a short tuft of hairs arising from a small subbasal fovea.

Indiana (Steuben Co.), May 25, 1909.

Anisotoma opacipennis, n. sp.—Moderately stout and convex, rufotestaceous. Head and prothorax shining, finely punctate. Elytra finely alutaceous and opaque, finely punctate striate, the ninth stria marginal, except for a short distance at base; alternate intervals with a single series of distant punctures, the intervals otherwise impunctate. Head finely alutaceous, but somewhat shining, rather closely punctate, a transverse series of four or five larger punctures. Antennæ shorter than the prothorax, third joint less than twice as long as wide and barely as long as the next two; joints 4-6 short, 6 strongly transverse, 8 lenticular, 9-10 large, subequal, 11 smaller, transverse, pointed. Prothorax strongly rounded and widest at middle, sides strongly convergent, nearly straight and a little sinuate in front, broadly arcuate and convergent behind; hind angles obtuse, ill-defined; lateral margin sparsely fimbriate; surface sparsely, finely punctate, a little more closely at sides, and with a series of larger punctures around the base angles. Elytra wider than the thorax, sides nearly straight and parallel in basal half; epipleuræ sparsely punctate and with bristling hairs. Mesosternum oblique, carinate; metasternum and abdomen alutaceous, but moderately shining, distinctly punctate. Front tibiæ flattened externally, subtriangular; hind tibiæ rather strongly thickened apically; hind femora very stout, suboval, less than twice as long as wide; front and middle tarsi long and slender, nearly as long as the tibiæ. Length, 4.2-4.4 mm.

Described from two female specimens taken by the writer at El Paso, Texas.

The large size; form of prothorax, opaque elytra, fimbriate margins of the body, very stout hind thighs and long tarsi mark this a very distinct species, totally different from anything else in our fauna. Another feature peculiar to this species exists in the very long spurs of the front tibiæ, these being very slender, parallel and about one-third as long as the tibiæ. In all other species of the genus known to me the spurs are short, stouter, and gradually pointed.

Anisotoma similis, n. sp.—Very similar to *collaris*, the description of which in Horn's Monograph of the Silphidæ (Trans. Am. Ent. Soc., VIII,

p. 289), fits so accurately that it is necessary only to mention the distinguishing character. In *collaris* the prothorax is wider at middle than at base, the sides being rounded-in basally. In *similis* the thorax is widest at the extreme base, the hind angles rather sharply defined and a little obtuse. The punctures of the elytral interspaces are very fine, except the coarser ones on the alternate intervals. Sexual characters as in *collaris*. Length, 3-3.3 mm.

Santa Monica, California. A single pair in the writer's collection.

Anisotoma antennata, n. sp.—Elongate oval, moderately convex, rufo- or flavotestaceous, shining. Head and prothorax minutely, sparsely punctate. Elytra regularly punctate striate, the striae not impressed, the ninth stria marginal except at base; elytral interspaces minutely, very sparsely punctate, alternate ones with moderately distant coarse punctures. Antennae nearly as long as the head and thorax, third joint as long as the next two, joints 4-6 each as long as or a little longer than wide, 7 obtrapezoidal, about as long as wide, 8 small, twice as wide as long, 11 as wide as 10 and nearly as long as 9-10 united, apex obliquely truncate. Prothorax one-half wider than long, narrowed from the extreme base, the sides becoming basally almost parallel; hind angles distinct and nearly rectangular. The head shows the usual transverse frontal series of coarser punctures, and there is a line of coarser punctures along the basal margin, these becoming closer and less regularly serial at the angles. Elytra twice as long as the prothorax and about one-third longer than wide, sides parallel in basal half. Metasternum and abdomen alutaceous, sparsely punctate, the abdomen more finely so. Length, 2.5-2.9 mm.; width, 1.3-1.5 mm.

Pasadena, California.

The only two examples known to me are females; they have the hind femora gradually broader outwardly, the condyle a little prominent, but not at all dentiform; tibiae straight. The form is more elongate than in any of our other species except *ecarinata*. There is a series of minute punctures along the extreme edge of the basal margin of the prothorax, not noticed by me in any other species. The form of the last antennal joint is peculiar to this species, and its mass is relatively greater than in any other known to me, being nearly equal to that of the two preceding joints combined.

Anisotoma sculpturata, n. sp.—Oblong oval, moderately convex, rufotestaceous. Head and prothorax shining, the former rather closely,

the latter more finely and sparsely punctate, especially at the middle. Elytra densely longitudinally reticulato-aciculate, finely striate, the striae punctures fine and much obscured by the sculpture of the interspaces. Antennæ short, the club very broad, and constituting rather more than half the length; eighth joint very thin, lenticular, the third joint as long as the next two together. Clypeal suture completely obliterated. Prothorax rather strongly rounded at sides, widest behind the middle, hind angles defined, but very obtuse. Mesosternum nearly vertical between the coxæ, carinate. Metasternum coarsely punctate. Legs short, the femora stout. Length, 2.3 mm.

Flagstaff, Arizona. A single female collected by Dr. Fenyes.

The sculpture of the elytra will, if constant, at once distinguish this from any other species in our fauna. It is, however, very nearly identical structurally with *obsoleta*, and is possibly only a remarkable aberration of that species. The sides of the prothorax are a little more rounded basally, the hind angles more obtuse and the punctuation of both head and pronotum a little more pronounced than in *obsoleta*.

As remarked by Horn, the subvertical mesosternum of *obliterata* and non-carinate mesosternum of *carinata* mark these species as aberrant members of the genus. Horn, however, apparently did not notice that these two species differ furthermore from all others of our fauna in the total obliteration of the clypeal suture. *Obliterata* and *sculpturata*, in addition to the subvertical mesosternum, have the outer edge of the front tibiæ laminate to a degree not approached by any other of our species.

CYRTUSA.

The following very distinct species, most nearly related to *blandissima*, may best be made known by the subjoined diagnoses:

C. blandissima, Zimm.—Elytra striæ not impressed, the intervals flat, the ninth (marginal) much wider than the eighth; metasternum coarsely punctate at sides; abdominal segments each with a row of coarse, deep, closely-placed punctures along the basal margin; basal three joints of antennæ subequal in length, but gradually diminishing in thickness, the third about as long as the next two. Length, 1.5-2 mm.

C. superans, n. sp.—Elytral striæ more closely punctured, finely impressed, more evidently so at sides and apex, where the intervals are in consequence a little convex; eighth and ninth intervals subequal in width; metasternum less closely and more finely punctate; abdominal segments finely, somewhat irregularly punctate; basal three joints of

antennæ rapidly diminishing both in length and thickness, the third distinctly shorter than the next two. Length, 2.1 mm.

The elytral interspaces are very finely and sparsely punctulate or nearly smooth in *blandissima*; more evidently punctate in *superans*. According to Horn, the middle tibia of the male is "normal" in *blandissima*; in *superans* the tibia is thickened and arcuately produced internally at apex.

Superans is known only by the unique male type, taken at Tyngsboro, Mass., by Mr. Blanchard.

ON SOME PREOCCUPIED GENERIC NAMES IN INSECTS.

BY G. W. KIRKALDY, HONOLULU, HAWAIIAN ISLANDS.

While keeping up to date and partially revising my "Scudder" and "Waterhouse," I have from time to time noted several preoccupied generic names, which, so far as I have been able to find out, have no synonymy whereby the older name could be replaced without fresh creation. As letters to specialists have usually resulted in no action being taken in the matter, I now rename a number of them, in the hope that natural indignation at such an unlawful trespass on my part may induce specialists to purge their own lists. A further number I have left untouched, as I am unable to ascertain their possible synonymy.

Lepidoptera.

Feredayia, = || *Erana*, Walker.

Maorides, = || *Exoria*, Meyrick.

Americides, = || *Dryope*, Chambers.

Pempeltias, = || *Peltophora*, Meyrick.

Porina, Walker, is preoccupied, but is probably replaceable by other Walkerian names.

Diptera.

Neotropicalias, = || *Cyclogaster*, Macquart.

Coleoptera.

Sharpides, = || *Sharpia*, Broun.

Nesoptychias, = || *Ptychopterus*, Broun.

Hemiptera.

Philapodemus, = || *Hahnia*, Ellenrieder.

Varelia, = || *Munia*, Varela.

HABITS OF SOME MANITOBA TIGER BEETLES
(CICINDELIDÆ). No. 2.

BY NORMAN CRIDDLE, TREESBANK, MANITOBA.

My last paper* dealt chiefly with these insects in the adult, or beetle state. In the present more attention is paid to their habits while in the earlier stages. My investigations have been conducted entirely in the field, under absolutely natural conditions, and unless otherwise stated, were made in the neighbourhood of Aweme, Manitoba.

Two valuable papers on Cicindelian habits have been added to my literature upon this subject, through the kindness of Prof. Shelford, of Chicago University, since the first of these articles appeared. The latter, "Life Histories and Larval Habits of the Tiger Beetles (Cicindelidæ),"† contains much interesting information upon the earlier stages of these insects, some of which must unavoidably be duplicated here. It will be noticed, however, that there is a striking difference in the life-cycle of some of the species observed by Prof. Shelford at Chicago and those noted by me at Aweme, even when the same, or a closely related form, is involved, the difference being a prolongation of the larval life over a second winter in Manitoba. This seemed to me to be such a remarkable fact, considering that there are less than 600 miles of latitude between the two places, that I felt almost persuaded that some mistake had been made on my part, and consequently decided to make further observations before publishing these notes. The result has been to leave no doubt that the life-cycle of species carefully observed—*C. Manitoba*, *venusta*, *limbata*, *limbalis*, and probably others—lasts for approximately three years; duration of larval stage, 24 to 26 months; pupal, two to four weeks; adult, 10 to 12 months. This corresponds to F. Enock's account of the "Life History of *Cicindela campestris*,"‡ excepting that the adults nearly if not always appear in August or September, constant observation having failed so far to detect overwintering pupæ. There is, however, considerable difference in the dates at which the beetles appear, the period of emergence in *C. Manitoba* and *venusta* often lasting over a month, and some of the former appear so late in the season that there is a possibility of a few remaining in the pupal cavity until the following spring, though the

*CAN. ENT., Vol. XXXIX, April, 1907.

†Linnean Society's Journal-Zoology, Vol. XXX, Mar., 1908.

‡Proc. Ent. Soc., London, 1903.

January, 1910

depth at which adults usually hibernate would seem to indicate that they might suffer from frost in the pupal chamber so near to the surface.

In Manitoba there are often long intervals of inactivity during the summer months of the larvæ of *Manitoba*, *venusta*, *limbata*, *Lecontei*, and probably others. At such times the larvæ close their burrows at the top, and remain apparently without food, and do not grow appreciably. In 1907, larvæ of *venusta* and *limbata* closed their holes on June 12, and some did not appear again until August 25, nearly two and a half months. A few, however, would open up at night, throw out a lot of earth, and then retire again. These larvæ were always active when dug out. This strange habit may be due to the dryness of the soil to some extent, though it is not altogether so, as holes have remained closed during wet weather, and they are always opened in autumn or late summer, and deepened before winter, no matter what the condition of the ground is. The extreme heat of the sun may also be a factor of some importance. The beetles are unquestionably influenced by temperature, and will go into winter quarters earlier on a dry, hot fall than they do during a cold one, and hot summer days are much preferred for commencing winter homes.

C. formosa Manitoba, Leng.—The larval burrow (Fig. 1) of this variety differs from all the other species dealt with here, and closely, if not

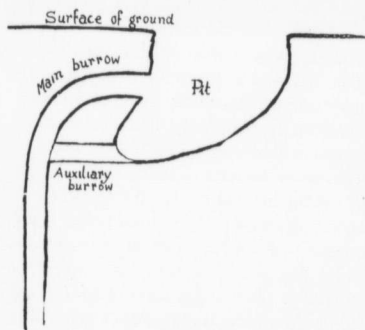


FIG. 1.—Burrow of *Cicindela Manitoba*.

exactly, resembles that of *generosa*, as described by Shelford. The burrow does not run in a straight line, as in other kinds, but when about one and a half to two inches from the surface gradually bends over so that the entrance enters a cup-like excavation about a quarter of an inch from the top, and at right angles to the perpendicular part of the hole. The pit or cup-like excavation varies in size according to the age of the larva, and also to some extent in individuals of the same age, but in mature specimens is on an average one and a half inches wide, an inch

across from the entrance, and about the same in depth, with a downward slant towards the burrow. Larvæ dug out and watched, dug new holes in the following manner: The burrow was begun much on the slant, and dug back for some two inches, gradually turning downwards until a perpendicular position was arrived at. In excavating the pit the larva reached out and threw the earth backward, and in doing so gradually worked the burrow back until it became about a quarter of an inch from the surface. This made approximately the correct length of the pit. The larva now turned its attention to deepening the pit. This was accomplished in the individual watched by constructing an auxiliary hole from the perpendicular one horizontally into the bottom of the pit. The earth was then worked up from below, and shoved round the chief entrance until it became blocked, when the insect returned and threw the earth backwards from the main burrow. This operation was repeated a number of times, until the pit became nearly full depth, but its completion was not observed owing to the larvæ devoting its energies to the chief burrow for several days. The pits usually become partly or wholly filled up when the larvæ deepen their burrows before hibernating, and therefore have to be cleaned out again in the spring, but whether this is done by means of an auxiliary hole or not is doubtful. Some burrows examined showed signs that such was the case, others left no indication. The larvæ are very active, both in and out of their holes.

There is no doubt that the pits act chiefly as traps for insects such as ants, which are captured while endeavouring to make their way out. Experiments of throwing small ants in resulted in their immediate capture as soon as they reached the bottom, with such rapidity that it was difficult to see how they were seized, though the larva had to reach out fully half its length to secure them. Small bugs, when touched, which was seldom, were at once rejected.

The pits also act as a protection against drifting sand and heavy rains, but this is probably accidental, as the burrows are seldom in very open places, and are often where the sand never drifts.

Twenty larval holes of the second year were measured when the insects had finished digging. These showed an average depth of 66 inches, the shallowest being 50 inches, and the deepest 79 inches. Four others were over 70 inches below the surface.

The larval stage of *Manitoba* lasts approximately 24 months, and the adult about 12. The pupa has not been observed.

All remarks about larvæ under *Manitoba* in my first paper should be referred to *venusta*. Fuller observations have shown that owing to the great depth at which it hibernates, *Manitoba* is the last tiger beetle to appear in the spring. In 1908 adults remained in winter quarters until the end of May, and larvæ still later.

Venusta, Lec.—Young larvæ appear about the first of July, and at once proceed to deepen their burrows to a foot or more in the course of a couple of weeks. They then remain active, excepting while moulting, until the middle of October, during which period they grow very rapidly, and at the approach of winter deepen their burrows considerably, and after closing them remain dormant at the bottom throughout the winter. They then appear again in May, close their holes in June, and usually remain inactive until August, the burrows are then opened up and deepened to the extent of a few inches, closed in October for a second winter, and reopened the following spring. About the middle of June the larvæ construct a side chamber, starting from half an inch below the surface and branching off from the original burrow. The chamber varies in length, but averages three inches, and is generally about the same in depth at its extremity, where it is widened out into a chamber, about twice the width of the entrance. In this the larva changes to a pupa facing the top. Holes were observed closed on June 22, and by July 10 two larvæ had become shortened, evidently changing to pupæ. The first pupa was discovered July 15. This was situated about the middle of the pupal cavity, not in the largest part. On August 10 two imagoes were found still in the pupal cell. Both ran actively when dug out, and one made several short flights. On August 19 a large number of pupal chambers were examined, and only three adults found, all of which had partly dug out. By the 20th of August several beetles were digging winter quarters, and by September 1st most of them had disappeared below the ground.

The life of the adult is slightly shorter than *Manitoba*, but old individuals have been found in September. Larvæ show no signs of constructing pits, the holes being perpendicular throughout their entire length. Of a large number of second-year larval holes measured at the approach of winter, the average depth was 45 inches, the shallowest 32, and deepest 55 inches. Young larvæ were usually several inches shallower.

Limbata, Say.—The larvæ of this species appear from eggs at about the same date as *venusta*, and like that species are often at first found

clustered together, so that a dozen may be discovered in an area of a foot square. They usually inhabit situations where the sand is constantly drifting, which on account of its continual movement and lack of vegetation is always moist a few inches below the surface. The life-cycle is approximately the same as *venusta*. On July 22, 1907, larvæ had filled up old burrows with earth from the pupal cavity. This latter was commenced three inches below the ground, and was five inches in length, gradually sinking at its extremity to five inches below the surface. (Fig. 2.) Larvæ at this time were still quite active, and at once commenced to dig new holes when disturbed. Two pupæ were found on August 11, one only just changed from larva, and also an adult still in the pupal chamber. Most of the beetles were out by the 20th, though odd individuals appeared as late as the first of September. The larvæ remain active in the pupal chamber for fully two weeks, and occasionally longer.

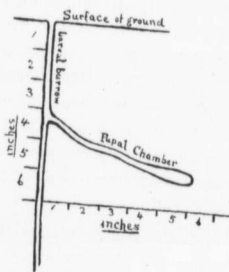


FIG. 2—Pupal burrow of *Cicindela limbata*.

Purpurea limbata, Klg. — Larvæ are usually found in damp situations, not more than six feet from surface water. Old pocket gopher hills and damp fields, where there are open spots, seem to be preferred. Pupal chambers are constructed some weeks before transformation takes place. The few examined opened at or near the surface of the ground, and varied from three to five inches in length. Two remained open for several days.

In summer larval holes are seldom more than six inches in depth, and their average, when closed in the fall, from the few measured, seems to be about eight inches. Twenty-four adults dug out in wet, sandy soil were found at an average depth of six inches, with little variation, and the burrows were open nearly the entire length.

The larval life lasts approximately two years, and the beetles from nine to eleven months.

Tranquebarica, Hbst.—Little new information has been secured regarding this species. Larvæ still digging were found on September 21st at an average depth of 17 inches, the deepest being 20 inches. Two holes

measured, when full depth, were only 18 inches in length. All were slightly on the slant from a level surface.

Two distinct sizes are to be found among the larvæ in autumn, which correspond to the first and second year of *venusta*, so that it seems highly probable that the larval life lasts two years, while that of the adult continues for about 11 months.

Fulgida, Say.—An interesting form of this species, with rather variable markings, has been collected by Mr. J. B. Wallis at Westbourne, Man., who says of it: "I took *fulgida* on what is known at Westbourne as the Salt Plain, an alkaline stretch of some extent. The plain is in the main fairly well covered with a loosely-growing wiry grass, with fairly numerous bare or nearly bare patches of soil not sufficiently alkaline to be more than gray. Here *fulgida* was plentiful in company with *tranquebarica*. The species is of strong flight, readily passing from one bare spot to another."

The above mentioned specimens were taken during the middle of August, and the species will probably be found to hibernate not at any great depth.

Scutellaris Lecontei, Hald.—Larvæ are found in similar situations to the beetles. A pupa was discovered on August 10 at a depth of five inches, and one inch from the larval burrow. On the 11th four adults were dug out, one of which had very recently arrived at maturity, and another had worked its way to within half an inch of the surface. The pupal chambers were from one to two inches in depth, where they branched off from the main burrow, and from two to three inches in length, dropping an inch in two and a half. Five larval holes at the approach of winter averaged 28 inches in length. The beetles have been found in fair numbers, especially when hibernating. They select denser vegetation than most of the other kinds, and prefer the south edge of bushes which border old fields. They pass the winter at 10 to 26 inches below the surface of the earth.

Pusilla, Say.—No larvæ have been found in Manitoba, but two new localities for the beetles were discovered, one specimen being taken by Mr. Wallis at Westbourne among the grass, and three by Stuart Criddle near the mouth of the Souris River, on a gravelly shore. These insects made no attempt to fly, but seemed to rely entirely upon their power of running and hiding to escape capture.

Pusilla terricola, Say.—Mr. Wallis has also added this variety to the Provincial list, having taken several specimens at Westbourne. He says of it: "*Terricola* was taken in a considerably different situation from *fulgida*. North of the river there are in many places bluffs of small aspens, and sometimes willows, these latter encircling small sloughs. Among these bluffs the grass is often of a tufted character, and the species in question was taken among these tufts. The ground here, too, was of a rather alkaline nature. This variety made no attempt to fly, but seemed to trust to losing itself in the grass, among which it ran with astonishing quickness."

Both *pusilla* and *terricola* were determined through the kindness of Prof. Wickham.

Lepida, Deg.—The larvæ of this species were discovered in pure drifting sand, often on the side of sand banks which were constantly moving with the wind. On the date when these were examined, September 28th, most of the burrows were still open, and the larvæ digging during the heat of the day; consequently there was much variation in the depth of holes. Large larvæ, probably second year, were found in soft sand at 66, 60, 58, 70 and 72½ inches below the surface. Small larvæ, first year, at from 30 to 32 inches in depth. Taking the deepest as a guide, these being the only ones closed at the top, we might expect wintering larvæ to be found at an average depth of 70 inches at least. The larvæ vary very much in size, doubtless due to food conditions. The larval life probably lasts two years, and the adults two months.

A NEW PROCTOTRYPID IN THE FAMILY SCELIONINÆ.

BY G. E. SANDERS, URBANA, ILL.

Hoplogryon Bethunei, n. sp.—(Subfamily Teleasini, Genus Hoplogryon, Ashmead.)

Normal position: Male: Length, 2 mm., large for the genus.

General colour black, mandibles yellow, teeth brown, antennal bulb brown, base of scape brownish, remainder of antennæ black; articulation between coxæ and trochanters yellow, trochanters yellow, femur and tibiæ yellowish-brown, lighter at tips, tarsi yellowish-brown, remainder of body shining black.

Head two and one-half times as wide as thick, sparsely hairy. Cheek and lateral part of face coarsely, heavily, vertically striated, a portion of

the striæ being continued above, encircling the eye. Middle part of face between the eyes smooth and shining. Vertex about ocelli lightly striated. Clypeus coarsely, transversely striated. Mandibles with two equal acute teeth, the inner with small lobe at the base between the two.

Antennæ as long as body. Antennal bulb twice as long as thick. Scape of moderate thickness, reaching to ocelli. Pedicel as long as thick. Flagellum tapering slightly, first flagellar joint two and one-half times as long as thick, second twice as long as thick, the remaining eight one and one-half times as long as thick.

Thorax: Pronotum narrow from above, finely and densely punctate. Mesonotum heavily interruptedly striate longitudinally, moderately clothed with short, fine hairs. Scutellum coarsely roughened moderately clothed with short hairs. Postsutellum roughly tuberculate, spine of moderate size, tip slightly produced and thin.

Abdomen ovate. First segment as wide as long, coarsely and heavily striated longitudinally. Second segment as long as first, coarsely and heavily striated. Third segment as long as the two preceding together, and slightly more than one-third as long as the entire abdomen, slightly wider than long, the central half of the dorsal surface being coarsely but less heavily striated than the preceding two, the portion not striated smooth and sparsely hairy. The remaining segments very finely punctate and thinly covered with fine hairs.

Legs: Coxæ: outer or lateral surfaces smooth, inner surface covered with fine hair; trochanters, femora and tibiæ normal; tarsi five-jointed, the first joint as long as the remaining four.

Wings reaching slightly beyond the tip of the abdomen, finely ciliated, pubescent and very slightly smoky, veins brown. Submarginal and marginal vein with a row of stiff hairs projecting forward beyond the edge of the wings.

Striæ on third abdominal segment, lobe between teeth, large size, long first flagellar joint and colour go to distinguish this species. It comes nearest to *H. longipennis*, Ashmead, and *H. tibialis*, Ashmead.

Described from one ♂ taken at Aurora, Ill., June 15th, 1909, in a nest of *Formica subrufa*. This, however, should not be taken as indicating definitely that the species is myrmecophilous.

Type deposited in Illinois State Laboratory of Natural History, Accession No. 39771. Named in honour of Prof. C. J. S. Bethune, Ontario Agricultural College, Guelph.

NOTES ON NORTH AMERICAN LYCOSIDÆ.

BY RALPH V. CHAMBERLIN, PROVO, UTAH.

From the list of North American Lycosidæ given by the author in his recent Revision, some names that he had placed in synonymy were inadvertently omitted. These are listed below, together with supplementary notes upon a few other forms, and some comments of more general character. A few species of Walckenaër, Tullgren and others are reserved for discussion as to synonymy in a subsequent article.

Pirata procursus, Montgomery (Proc. Acad. Sci., Phil., 1902, p. 583) = *Pardosa xerampelina*, Keyserling (Verh. z. b. Ges. Wien., 1876, p. 622).

This synonymy was noted in the Revision under *P. xerampelina*, but was omitted from the general list given in the early part of the work.

Pardosa solivaga, Montgomery (Proc. Acad. Sci., Phil., 1902, p. 574) = *Schizocosa ocreata*, Hentz (J. Bost. Soc. Nat. Hist., 1844, p. 391).

Like the preceding, noted previously in the Revision under the species, but omitted from the list.

Lycosa nidifex, Marx (American Naturalist, 1881, p. 396). The author placed this previously as a synonym of *Pikei (arenicola)* upon the authority of Banks, who presumably had access to Marx's types. Mr. Banks informs me that he now regards the species as distinct, a view which I can confirm fully from a study of a pair of individuals apparently representing it, and kindly sent me for identification from the American Museum of Natural History by Dr. A. Petrunkevitch. The form was not previously known to me at first hand. The copulatory organs present definable differences from those of *Pikei*, and more decided ones from those of *fatifera*, with which it also has affinities of a close kind. A description of the form, with figures of epigynum and palpal organ, follows:

Female.—Integument of cephalothorax dark reddish-brown without definite light markings, but the median dorsal portion of pars cephalica and the clypeus paler; the hair in specimens described mostly rubbed off. Chelicerae reddish-brown, like the cephalothorax, densely clothed with rusty-yellow hair with intermixed darker bristles. Labium and endites brown, both paler distally. Sternum and coxæ of legs beneath light yellowish-brown, clothed with light hair. Legs light yellowish-brown, entirely without darker markings, excepting that the ventral surface of anterior tibiæ, tarsi and metatarsi are darkened; densely clothed with gray hair with numerous longer dark coloured bristles, especially on joints

distad of the femora. Integument of abdomen light yellowish-brown, like that of the legs; dorsum with a solid black lanceolate mark at anterior end; which does not reach the middle caudad and which is truncate apically; anterior face and venter behind genital furrow black, the two areas connected laterally.

Face in height less than half the length of the chelicerae, which are massive and long; pars cephalica relatively wide, much as in *fatifera*; cephalothorax highest immediately back of the third eye row, from there slanting decidedly ventrad to second eye row in the anterior direction, and caudad descending gradually to dorsal groove, and then more abruptly descending as the posterior declivity to the posterior margin, the dorsal line gently convex between eyes and dorsal groove; face in profile appearing almost in a straight line with upper portion of chelicerae, not bulging over the bases of the latter.

First row of eyes distinctly shorter than the second (3.4:4); slightly procurved, the lower edges of the lateral eyes almost in a straight line with the lower or ventral edges of the median; anterior median eyes larger than the lateral (ad 5:7), scarcely their radius from each other and slightly farther from the lateral. Eyes of the second row about four-fifths their diameter apart. Dorsal eye area in length contained about 4.5 times in that of the cephalothorax.

Anterior tibiae armed beneath as usual, the spines short; a single short spine on anterior face. Patellae of first legs armed on anterior face with a single short spine. Tibiae of third and fourth pairs of legs without spines on dorsal surface.

For structure of epigynum see fig. 3.

Length of cephalothorax, 8.8 mm.; width, 6.25 mm.

Length of leg I, 20.8 mm.; tibia + patella, 7.5 mm.; metatarsus, 4.1 mm.

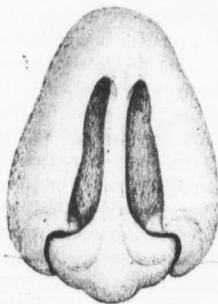
Length of leg II, 19.8 mm.

Length of leg III, 18.4 mm.

Length of leg IV, 24.5 mm.; tibia + patella, 8 mm.; metatarsus, 6 mm.

FIG. 3.—Epigynum of *Lycosa nidifex*.

Male.—Coloration in general as in the female. Ventral surface of anterior tibiae black, excepting proximally, the



ventral surfaces of metatarsi and tarsi also black. Tarsi of palpi reddish-brown.

Spines of legs longer relatively than in the female. Tibiæ of legs of the third and fourth pairs each with a long spine at proximal end and with one distad of the middle on dorsal surface.

For structure of the palpal organ see fig. 4.

Length of the cephalothorax, 8.5 mm.; width, 6 mm.

Length of leg I, 25.3 mm.; tibia + patella, 8.5 mm.; metatarsus, 5.7 mm.

Length of leg II, 22.6 mm.

Length of leg III, 21.9 mm.

Length of leg IV, 27.3 mm.; tibia + patella, 8.7 mm.; metatarsus, 7.2 mm.

Locality.—United States (inland). The specimens above described are from a locality not definitely known, but possibly from Arizona or Southern California. *Pikei* would appear to displace it on the seashore.



FIG. 4.—Palpal organ of *Lycosa nidifex*.

Prof. Montgomery's Species.—The female of *Lycosa nidifex*, above described, is seen to agree with *Pikei* and *fatifera* in lacking spines above on the tibiæ of the third and fourth legs, and would thus go into *Geolycosa*, Montgomery, as Banks defines it, while the male has these tibiæ armed above as usual, and must be separated from the female and referred to *Lycosa*. Thus the only definite character that has been suggested for the maintenance of *Geolycosa* as a genus is found not to be tenable, as on other grounds I have elsewhere stated, and as was to be expected from its nature. As the characters upon which Montgomery bases the genus originally are wholly intergrading, there appears at present no reason for maintaining it. As its author conceives it, it can be used only in an uncertain way and is not natural. *Carolinensis* being included in it, various other forms must also logically follow, and finally all species of *Lycosa*. Doubtless *apuliæ*, the European species most close to *Carolinensis*, must be included with the latter wherever placed; but if so, the genus *Tarentula*, Sund., erected as long ago as 1833, with *apuliæ* as the type, would have to be used in case of removal from *Lycosa*.

I believe, furthermore, that the other genera in the *Lycosidae*, as conceived and defined by Prof. Montgomery, are in some degree artificial and too indefinitely limited to be followed. Perhaps this may best be indicated by referring to some things in his own usage. Thus he is led to place his *humicolus*, in all fundamental structural features a typical *Pirata*, under the exotic genus *Aulonia*; describes (1902 and 1904) as a new species, *procursus*, under *Pirata* specimens of Keyserling's *xerampelina*, a strongly-marked *Pardosa*; in the same papers refers some specimens of *ocreata*, Hentz, to *Pardosa* as a new species, *solivaga* and others to *Lycosa* as another new species, *Stonoi*, etc. Then, again, he considers under *Lycosa* (1904) Keyserling's two species, *xerampelina* and *Mackenziana*, which are certainly naturally within *Pardosa* and well-marked representatives of this genus. It would seem possible in this last case that these species were simply taken up from literature, and that Prof. Montgomery did not perceive that Keyserling uses *Lycosa* where in our present nomenclature we use *Pardosa*.

Such facts as these doubtless explain some of the synonyms among the names proposed by Prof. Montgomery. Others result from the omission, or apparent omission, from consideration of the species described by Mr. Banks, as well as those of various other authors. Even in the case of Keyserling's species, which are all so fully described, and all of which Prof. Montgomery claims to include in his '04 paper, four are omitted. Then it would seem that he much underestimates the extent of variation in the group, and that differences due solely to ordinary individual variation and to variation with age are in some cases made the basis for separation of forms as species. This is the case, as I believe, with his three species, *euepigynata*, *insopita* and *Purcelli*, the differences being due to age, and all belonging to Keyserling's *pulchra*, which is preceded by Walckenaer's *gulosus*, as elsewhere pointed out. Prof. Montgomery mentions a certain difference in the relative length of legs, but such a difference appears in other species between younger and older specimens, together with differences in proportionate length of joints. Even though Hentz's *saltatrix* be not used—though it is clearly recognizable—Montgomery's *relucens* and *charanoides* had been previously described by Banks as *gracilis* and *humilis*; though Hentz's *fatifera* be not used, the form described as *latifrons* has long been designated by Banks as *Missouriensis*, and similarly Hentz's *milvina* was followed by *flavipes* of Keyserling and *nigropalpis* of Emerton before Montgomery wrote. Hence the intimation that these names were placed as synonyms only through the resurrection of very early ones is without foundation.

In one special direction, however, Prof. Montgomery has probably overestimated variation, namely, in regard to the tarsal claws. In his '04 paper this author calls attention to the great variability of the claws, and in substantiation refers to a paper prepared under his direction. An examination of this paper reveals as examples of great variation the description and illustration of the occurrence of a doubling in the claws, this occurrence being spoken of as "mutation." Probably had the eyes of the same specimens been carefully examined, they also would have been found to have doubled, for, as will be clear to most students of the Arthropoda, the doubling was due simply to the fact that the spiders were moulting.

In dealing with Prof. Montgomery's species I may say that I have studied with care co-types sent me by him in 1904 of nearly all, and the statement made by that author that I had not seen any of the type specimens in his private collection is consequently misleading, for co-types labelled in his own hand should certainly be practically as reliable as those that may have been chosen for preservation as types. A few types which Prof. Montgomery felt he could not loan through the mails, furthermore, represent almost the only described species of North American Lycosidae, of which types are known to exist and to be available which I have not studied with care.

Quite on the contrary, indeed, had it not been precisely for this study of types or cotypes, I must have regarded more of Prof. Montgomery's species as good. Every worker has a certain "personal equation" which must be considered, and a description must be interpreted in accordance with the preponderating, consistent evidence of the whole as against the contradiction of a part. Prof. Montgomery quotes from his own published descriptions to substantiate his contention for the specific separateness of certain forms; but to show the folly of regarding recorded observations absolutely and as necessarily correct and authoritative, there may be mentioned wide differences of statement concerning the same character in the same species, and even in the same identical specimen where Prof. Montgomery writes of it at two different times. Thus, in his paper of 1902, p. 538, in describing *Lycosa nigra*, Stone, he writes: "Eyes of the second row largest, less than their diameter apart," while concerning the same form in 1904, p. 285, he writes: "Eyes of second row largest, almost 1.5 times their diameter apart." Also in the first place he says concerning the first eye row: "Middle eyes larger and higher than the

lateral," while in the second the corresponding statement, is: "First row *straight*." The species *contestata* (which, as before mentioned, is *pratensis*, Em.) was based on a single specimen, concerning which, in the paper of 1903, p. 649, it is written: "*Dorsal eye-area more than 1.5 the length of the cephalothorax*," while in 1904, p. 649, the statement is: "*Dorsal eye-area to the cephalothorax as 1:6*." Also in the first place: "*The length of the chelicera is about twice the height of the head in front*," while in the second he writes: "*Chelicera fully 2.5 times the height of the head in front*," etc.

COLLECTING BEETLES IN MEXICO.

BY FRANK R. MASON, GERMANTOWN, PA.

Although very much neglected in an entomological sense, the great Republic of Mexico, comprising nearly eight hundred thousand square miles of territory, is a fascinating field for the collector. It has been my good fortune to visit the country several times, but my trips have always been more or less hurried, so that collecting has been a side issue to which I should like to have devoted more time. It might be well to say that I only collected Coleoptera.

This last summer my way led southward from St. Louis through Texas, entering Mexico by the Laredo gateway. Our first stop-over was at Monterey, that city which has been so ravaged by fire and flood. Nothing especially interesting entomologically was turned up here, the fauna being practically Texan for some distance south of the Rio Grande. *Aphonus tridentatus*, Say, several species of *Ligyris* and *Xyloryctes satyrus*, F., found their way into the potassium jar; *Euphoria basalis*, D. & G., was common on a species of cactus, while *Cotinis mutabilis*, Gory, was in great numbers, like swarms of bees, around the mimosas.

Two hundred and fifty miles further south, at San Luis Potosi, conditions were much the same; the same arid, semi-desert plateau country, with ranges of bare, jagged mountains always in view. A flying trip over the Tampico division of the Mexican Central Railway added to our captures a fine specimen of *Antichira lucida*, Ol., which flew in through the car window; I had some specimens of this in my collection from Brazil. Numerous *Heliconii*, *Victorina stelenes* and other unfamiliar tropic Lepidoptera were flying in the open forest glades in a most tempting way. From a scenic standpoint this journey from Cardenas down through the Tamasopo Canyon is probably one of the finest in the world.

January, 1910

One drops down in a few hours from the high desert country into all the luxuriant vegetation of the Gulf coast. The air is moist and humid from almost constant rainfall, and Nature seems fairly to have outdone herself in the wild riot of growth.

Again retracing our steps to San Luis Potosi, the next point at which I had any opportunity of collecting was in the neighbourhood of Lake Chapala, near Guadalajara, in the western part of Mexico. *Calosoma angulatum*, Chev.; *Epilachna Mexicana*, Guer.; *Pelidnota virescens*, Burm.; *Acanthoderes funeraria*, Bates; *Taricanus Truquii*, Thom.; *Calligrapha serpentina*, Rg.; *C. diversa*, Stl.; *Zygomma malva*, Stl.; *Leptinotarsa Haldemanni*, Rg., and numerous other Phytophaga (as yet undetermined) were among our captures. Also *Trachyderes elegans*, which would light on the upper branches of the thorn trees in a most provoking way. Several species of *Macroductylus* were found in the gardens.

Cicindelidæ I always found to be very scarce; it may be I was never at the right season for them. *Cicindela flavopunctata*, Chev., and *C. mellyi*, Chd., I collected near Oaxaca, in southern Mexico, but they are the only ones. At Necaxa, in the State of Puebla, was found the remarkable *Chrysinia macropus*, Franc.; in the male the hind femora are so enormously developed that it gives the beetle the appearance of walking on stilts. The species normally is a delicate apple-green colour, though some of the specimens are speckled like an egg.

But of all the collecting I have done in Mexico, the vicinity of Cordoba, in the State of Vera Cruz, has yielded the largest number of species. Take this section of the country from Motzorongo to Jalapa, and as far west as the town of Orizaba, at an elevation of 4,000 feet, one finds an ideal tropical country, a healthy climate, with all the rich and beautiful growth of the torrid zone, and but few of the disadvantages. Almost nightly rainfall or dense mists blown in from the Gulf keep things green and fresh. The graceful cone of Orizaba volcano, nearly 18,000 feet above sea level, is almost always in view, and its snow-covered summit forms a striking contrast when seen from the forests of the low-lands. Collecting at the electric lights, with which the plazas in even the smaller towns are supplied, yielded such interesting things as: *Acrocinus longimanus*, L. (the harlequin beetle of the Amazon); *Callipogon senex*, Dupont; *Dynastes hyllus*, Chev.; *Xyloryctes telephus*, Burm.; *X. furcatus*, Burm.; *Coelosis biloba*, L.; *Heterogomphus Chevrolati*, Burm.; *Podischnus tersander*, Burm.; *Strategus Julianus*, Burm.; *Golofa*

Pizarro, Hope; *Cyclocephala mafaffa*, Burm.; *C. stictica*, Burm.; *C. sanguinicollis*, Burm.; *Enema pan*, F., and several other species of which I am uncertain. Beating in the woods and undergrowth was equally productive: *Mallodon dasystemus*, Say; *Teniotes Luciani*, Th.; *Trichophorus Chevrolati*, Guer.; *Callichroma melancholica*, Bates; *Hammoderus ornator*, Bates; *H. spinipennis*, Thoms.; *Ptychodes politus*, Serv.; *P. trilineatus*, Linn., and *Lagochirus araneiformis*, L., are some of the Cerambycidae obtained in this way. Chrysomelidae were also plentiful, including *Chalcophana cincta*, Har.; *Colaspis prasina*, Lefev.; *Monocesta ducalis*, Clark; *Diphaulaca aulica*, Ol.; *Diabrotica Curtisii*, Baly; *Lactica Chevrolati*, Jac.; *Mesomphalia illustris*, Boh.; *M. Lebasi*, Boh.; many species of *Lema*, *Haltica*, etc.

The country around the city of Vera Cruz I found unproductive; it is low, sandy, with very little forest, not to mention the heat, which is sometimes terrific. One would do far better to go inland to the wooded country, say about 2,000 feet in elevation.

The return trip from Vera Cruz to New York was made by sea. Much to my regret, we were not permitted to land in either Progresso, Yucatan nor Havana; there being yellow fever in Vera Cruz, we were quarantined against all intermediate ports.

In the above short account by no means all the species found are mentioned; I realize the subject has been merely touched on. If I have but aroused the interest of some other collector to work the field more thoroughly, I shall be satisfied.

CORRECTION.

In my "Key to the North American Species of *Æshna* found north of Mexico" (CAN. ENT., Vol. XL, pp. 377-391, 450 and 451), several more or less serious errors occur. The gravest of these appear in the measurements of the abdomen and wings, which must have been made with a faulty millimetre scale, as they are all too small by some 3-5 mm. The smaller measurements of appendages, genitalia, etc., have not suffered perceptibly by the defect in the scale. They will all appear correctly in my final revision of the genus. Other errors in the paper which can be corrected here are the following:

Page 378, seventh line from top, for *cephalad* read *dorsad*. Page 379, third line from bottom, and page 380, fifth line from top, for A_1 at its origin and the anal triangle, read A_2 and A_3 at their origin.—E. M. W.

THE BEE FAUNA OF CALGARY, ALBERTA.

BY T. D. A. COCKERELL, UNIVERSITY OF COLORADO.

I am indebted to Mr. F. H. Wolley Dod for a small but interesting collection of bees, which he obtained this year at Calgary. While there is nothing new to science, the collection is worth recording on account of the light it throws on the bee fauna of that region. The fauna is a composite one, with elements which seem to have been derived from different directions. It may be roughly divided into groups as follows:

1. Alaskan type.

Bombus flavifrons dimidiatus, Ashm.—Three females, June 15-21. The connection of this insect with *flavifrons* was discovered by Mr. Franklin, who will give full particulars in his forthcoming monograph.

2. Pacific Coast type.

Bombus Californicus, Cresson.—Four females, June 14-20, one at flowers of purple columbine in garden. These show variable indications of pale hair on the scutellum, and are thus transitional to the Rocky Mountain *B. dubius*.

3. Types characteristic of the North-eastern States.

Bombus consimilis, Cresson.—One female, July 14.

Bombus terricola, Kirby.—Two females, June 2 and July 14. Originally described from 65° n. lat.

Halictus Provancheri, D. T., and *Halictus albipennis*, Rob.—Females of each, June 14.

4. Types characteristic of the Rocky Mountains, though some are more widely distributed.

Psithyrus insularis, Smith.—Goes west to Vancouver Island.

Bombus bifarius, Cresson.—Five females, May 25, at bearberry. Very finely coloured specimens.

B. Edwardsii Cooleyi, Morrill.—One female, May 27, at bearberry. The relationship to *Edwardsii* was made out by Mr. Franklin, though I believe he does not employ the varietal name.

B. flavifrons, Cresson.—Six females, June 13 to 21. One at purple columbine in garden.

B. Nevadensis, Cresson.—Two females, June 22.

B. rufocinctus phaceliæ, Ckll.—One female, June 15.

B. rufocinctus astragali, Ckll.—One female, June 14.

SOME NEW AND RARE DIPTERA FROM WISCONSIN.

BY S. GRÄNICHER, PUBLIC MUSEUM, MILWAUKEE.

Two of the species considered in this paper were found in the eastern part of Wisconsin. The others were taken last summer in the north-western part of the State by the collecting expedition of the Milwaukee Public Museum down the St. Croix River.

Zodion lativentre, n. sp.—Length about 7 mm. Thorax black, with dark gray pollen. Abdomen broad, mostly dark red. Front reddish-yellow below, darker above, slightly pollinose along the sides. Occiput black. The black pile of the latter is longer and more dense than that on the front. Antennæ red, with a dark arista. Face and cheeks entirely yellowish. Cheek nearly as broad as the vertical diameter of the eye. Proboscis black, not quite twice as long as the head. Thorax with two broad, black, abbreviated, and widely separated stripes. Between these there are two narrow shining black stripes, extending from the suture to the front part of the thorax. Scutellum rounded, dark pollinose. The pleuræ are covered with pollen of a lighter shade than that on the mesonotum. First segment and anterior half of second segment of abdomen black, opaque. The rest of the abdomen is dark red, except the sides of the fourth and fifth segments, which are blackish. A narrow median pollinose stripe extends from the black area of the second segment to the fifth segment. All of the segments with more or less gray pollen on their sides. Hairs on thorax and abdomen all black. Legs red, with the exception of the upper surfaces of the front femora, which are black. Colour of the tarsi darker towards their tips. Wings with a brownish tinge, and an open first posterior cell. This species runs in Adams' table of the species of *Zodion* to No. 9 (Kans. Univ. Sc. Bull., II, 32), but it is quite distinct from any of the three species occupying that part of the table. Its colour and broad oval abdomen, taken in connection with its size, render it easily recognizable.

A single specimen, a male, was taken July 13, 1909, near the mouth of the Yellow River, Burnett Co., by the Milwaukee Publ. Mus. coll. expd. It is deposited in the collection of the Museum.

Anthrax Nemakagonensis, n. sp.—Length, 8-10 mm. Black; first antennal joint, lower part of face, and legs reddish. Front yellow tomentose and black pilose. First joint of antennæ twice as long as

second, third elongate-conical at its base. Epistoma greatly produced, sparsely covered with yellow tomentum. Proboscis not surpassing the oral margin. Occiput beset with yellow tomentum. Thorax with yellow tomentum, and copious long pile of lighter colour on the anterior margin, along the sides and on the pleuræ. There is a distinct patch of white pile, beginning above the root of the wing, passing around in front, and ending on the pleura below the root of the wing. In some specimens the patch is present on the pleura only. Bristles at the posterior angles of the thorax yellow, those along the posterior margin of the scutellum black. The tomentum of the scutellum is yellow. Abdomen with a mixture of black and yellow tomentum, the latter colour prevailing, the black mostly on the middle of the second, third and fourth segments. Light yellow pile on the sides of the abdomen, except at the posterior angles of the second, third, fourth and fifth segments, where it is black. Venter black, with yellow tomentum. Front tibiæ bristly. Legs yellow tomentose. Reddish colour of the legs changing to black on coxæ and tarsi. Claws of front tarsi distinct. Basal portion of wings brown, the apical portion entirely hyaline. The outline of the brown colour extends in a more or less broken line from the apex of the auxiliary vein to a point on the hind margin of the wing, situated a little inside of the apex of the axillary cell. Apex of the anal cell hyaline in all of the specimens, that of the axillary cell distinctly hyaline in some of the specimens only. A round hyaline spot at the antero-exterior angle of the second basal cell.

In the distribution of the brown colour on the wing, as in several other characters, this species comes close to *A. perplexa*, Coq., a Californian species. It differs from that, however, in having a shorter proboscis, yellow tomentum on the occiput, black bristles on the scutellum, and in some other points of minor importance. In the description of *A. perplexa* no mention is made of a hyaline spot in the second basal cell, a character which is present in each of the specimens of *A. Nemaqagonensis*. This species is not rare in the St. Croix region. Sixteen specimens, all of them in the collection of the Milwaukee Publ. Mus., were taken last summer by the collecting expedition of that institution as follows: Four, July 25, near the mouth of the Nemaqagon River, Burnett Co.; ten, July 28-30, near the mouth of the Yellow River, Burnett Co.; one, Aug. 4, near the Kettle River Rapids, Burnett Co., and one, Aug. 6, at Randall, Burnett Co.

Phthiria Aldrichi, Johnson.—(Psyche X, pp. 184-185.) On July 23, 1907, I collected at Cedar Lake, Washington Co., Wis., two female

specimens that are smaller than those from the type locality (Caldwell, Idaho), being about $2\frac{1}{2}$ mm. long, but undoubtedly belong to this species. In their markings they differ slightly from the type, as seen from the following: First joint of antennæ yellow; basal two-thirds of second joint black, the tip yellow; third joint black, with a very narrow yellow base. In one of the specimens the front, except ocellar tubercle and the face, entirely yellow; in the other there are three minute parallel dark lines running from the ocellar tubercle to within a short distance of the antennæ. Prof. Aldrich, who furnished the type specimens, states (*Psyche*, loc. cit., p. 185) that he collected them on a white sand bar along the Boise River at Caldwell, Idaho, June 24, 1901. It is very pale in life, and flies just like the drifting of the sand, close down and a short distance at a time. It is a fine instance of protective coloration. The male has beautiful purple eyes in life. My specimens were taken during the hottest hours of the day at the flowers of *Rudbeckia hirta*, in a sand pit on the southern slope of one of the numerous moraines that form the characteristic features of the topography of that region.

Pyrophana, Schiner.—In its geographical distribution this genus is restricted to the boreal areas of Europe (probably Eurasia) and North America, and is represented by two species only, both of which seem to be of rare occurrence in both hemispheres.

P. rosarum, Fabr.—Osten Sacken referred to this species in his Catalogue of N. Am. Diptera (1878) as having been found in the White Mts. of New Hampshire and in Massachusetts; but since that time it has not been reported from any part of this continent, and Prof. Williston states in his Synopsis of the N. Am. Syrphidæ that he does not know the species. A male specimen collected by the writer, June 5, 1898, in a tamarack swamp at Elkhart Lake, Sheboygan Co., Wis., evidently belongs here. It has a length of 9 mm. The two yellow spots on the third abdominal segment are narrowly separated, rounded posteriorly, and occupy the anterior two-thirds of the segment. In addition to these there are two faint and much smaller spots on the fourth segment that are widely separated, and take up hardly the anterior third of the segment. The occurrence of such spots on the fourth segment is not mentioned in the original description, but otherwise the specimen agrees very closely with the description.

P. granditarsus, Forster (*P. ocyMi*, Fabr.).—A male specimen in the collection of the Milwaukee Publ. Mus. was taken by the Museum coll. expd. July 25, 1909, near the mouth of the Nemakagon River, Burnett Co. This male shows the black spots on the posterior angles of the second and third abdominal segments, which are referred to in Prof. Williston's description (Synopsis of the N. Am. Syrphidæ, p. 56), as occurring in the female, but not in the male sex. This species is to all appearance not quite as rare as the preceding, it has been reported so far from several points in Canada, New Hampshire (White Mts.), and Massachusetts in the Eastern, and Washington in the Western United States.

SOME RECORDS OF HETEROPTERA.

BY J. R. DE LA TORRE BUENO, NEW YORK.

I am indebted to the kindness of Mr. R. P. Dow for the insects enumerated hereafter, which were taken the past summer. There is nothing extraordinary about them, but they show the distribution of certain species. From De Bruce, Sullivan Co., New York, the following are recorded:

Thyreocoris unicolor, P. B.

Euschistus fissilis, Uhler.

Thyreocoris lateralis.

Podisus cynicus, Say.

Euschistus variolarius, P. B.

From Clàremont, N. H., came the following:

Homæmus æneifrons, Say.

Nysius angustatus, Uhl.

Eurygaster alternatus, Say.

Phlegyas abbreviatus, Uhl.

Perillus circumcinctus, Stal.

Ligyrocoris contractus, Say.

Podisus modestus, Dallas.

Lygæus kalmii, Stal.

Podisus serieventris, Uhl.

Calocoris rapidus, Say.

Cosmopepla carnifex, Fab.

Capsus ater, Linn.

Mormidea lugens, Fab.

Aneurus inconstans, Uhl.

Euschistus fissilis, Uhl

Sinea diadema, Fab. (Nymphs.)

Euschistus tristigmus, Say.

Triphleps insidiosus, Say.

Alydus eurinus, Say.

It will be noted that the newer synonymy has not been employed, this being done in order to facilitate reference to Prof. Uhler's "Check List," and Lethierry and Severin's "Catalogue Général."

BOOK NOTICES.

CONTRIBUTIONS TOWARDS A MONOGRAPH OF THE SCOLYTID BEETLES.

1. The Genus *Dendroctonus*, by A. D. Hopkins, Ph. D.

This excellent monograph of the genus *Dendroctonus* was issued by the United States Department of Agriculture as Bulletin 17, part 1, of the Bureau of Entomology. It contains 164 text pages, eight full-page plates, and 95 text figures. The genus *Dendroctonus* had previously been dealt with by Dr. Leconte, in 1868 and 1876, and by Dr. Dietz in 1890. Now, after a long study of a large amount of material, including the available types, Dr. Hopkins has completely revised the classification, described several new species, and the younger stages of many, and has allotted the references in literature to their proper titles. In short, he has given us a complete and scholarly monograph of the genus, lacking only the bionomic features, which are promised for a future paper.

The first portion of the work deals with the history of the genus, the original description by Erichson, and a revised description by the author. The last extends over sixty pages, and includes forty-four excellent figures. The figures, with the exception of two, deal with the external and internal anatomy of the adult and larva of *D. valens*, and with the external characters of the pupa. This series of drawings is by far the finest yet published on the anatomy of the Scolytid beetles, and will be of great assistance in future descriptive work in the Scolytidæ.

"In all of this anatomical work the object of the author has been to acquire direct information on the facts as they exist in the subjects examined; such information to furnish a basis for the determination, naming, description and illustration of the anatomical elements as represented in the Scolytid beetles, and at the same time to serve as a guide to the determination of further facts relating to insect anatomy in general."

The text of this portion of the work presents many points of much interest to students of insect anatomy, too many even to mention in this short review.

The reversal of secondary sexual characters within the genus, referred to on page 52, is particularly interesting, as is also the discussion of "Progressive Modifications," with the accompanying plates of eyes, antennæ and tibix.

The variation in the epistoma of *D. valens*, as illustrated in fig. 10, will prove interesting to those familiar with the genus. It will be remembered that Dr. Dietz based his classification of this genus largely upon the characters of the epistoma, which he considered of specific value. I have never been able myself to find any such variations as Dr. Hopkins has figured. Thus again is emphasized the value of a long series of specimens in a study of this nature.

The last half of the work deals with the description and classification of the species. Including the new forms described, twenty-four species are now contained in the genus. The method of treatment is systematic and thorough. The species are usually discussed under the following sub-heads: Adult, Variations, Distinctive Characters, Pupa, Larva, Galleries, Distribution, Host Trees, Identified Specimens, Bibliography and Synonymy. A drawing of the adult and a chart showing the distribution are given in each case, and usually excellent figures of the galleries are included.

The bewildering tangle heretofore presented by the literature dealing with several of the species has been cleared up completely, and the "Revisional Notes" under certain of the species are invaluable.

Useful tables are given of the Secondary Sexual Characters, Pupal Characters, Larval Characters, Gallery Characters, Distribution, Relation of Species to Host Trees, and of the Host Trees themselves. A very complete Bibliography of the genus is given at the close.

More detailed descriptions of the new species described might perhaps have been desirable, in view of future descriptive work, and the key to the adult, while excellent, seems to present a few weak points; however, a perfect key to the genus *Dendroctonus* is hardly to be expected in this life.

The work throughout is systematic and complete, one of the best productions of its kind yet given us by American Entomologists.

All students of the Scolytidae will look forward with the greatest pleasure to the completion of Dr. Hopkins's "Monograph of the Scolytid Beetles."—J. M. SWAINE.

OUR INSECT FRIENDS AND ENEMIES: By John B. Smith. Lippincott Co., Philadelphia. (\$1.50.)

This book of 314 pages is the most interesting and comprehensive, popular and yet scientific account of insects as the friends or enemies of man, that we have yet seen.

In the first chapter the author defines what is meant by an insect, and for convenience divides all insects into eight orders. In following chapters he takes these orders in turn and discusses their beneficial or injurious relationship to plants, to man and to other animals. In addition, chapters are devoted to an account of the natural forces that keep insects under control, especially where the balance of nature is not disturbed by man. Of special interest in this connection is his description of the part played by parasites, by climate and by disease in checking increase.

The author's remarks on birds are likely to cause a good deal of criticism from bird admirers. He attributes to the feathered tribe much less importance than most writers on the subject would give them. In doing so, however, he states explicitly that birds have an important function to perform in connection with insect control, but that so far as our worst pests are concerned, their value has been greatly exaggerated. If birds are of less importance than many think, much less value, he claims, is to be attributed to protective coloration than popular opinion would give it.

The part dealing with insects as carriers of disease is full of valuable information, obtained from the results of the most recent investigations. Household insects come in for a good deal of attention, nearly all the species found being discussed and remedies suggested, so that this is a very valuable chapter.

Throughout the book Dr. Smith has never lost sight of the economic aspect, and the numerous references to individual species of an injurious nature are made more valuable by the suggestions for control which almost invariably follow.

The last chapter is called "The War on Insects," and is a resume of all the most up-to-date methods adopted by man for controlling injurious species.

The value of the book is considerably increased by frequent illustrations. Entomologists will find this work a boon to them, inasmuch as it brings within handy reach a mass of valuable information that is frequently required, and that would otherwise be obtained only through much searching. The general public will find it a most interesting revelation of a new world of marvellous interest, into which they have found it difficult to get more than a mere glance in popular books. The book should be in every farmer's home, and in every school and college library.—L. C.