THE PENTATOMIDAE OF QUEBEC

(Hemiptera - Heteroptera)

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A THESIS

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1. INTRODUCTION

The members of this family are in general of no economic importance in our region due to the fact that we do not find any injurious pests among them. On the other hand, many species are predaceous in habit, and therefore are beneficial. For this reason, we must draw attention to them in order to be able to identify these bugs and to use them in our fight against the injurious insects.

For the average entomologist, the determination of Heteroptera is becoming more and more difficult. Descriptions of species multiply, and it becomes almost impossible for anyone without an extensive library and much time to spare to do the work.

The primary object to the paper is to make it possible for the worker to recognize with little difficulty and absolute certainty the forms that are known to occur in this region.

The purpose throughout this paper has been to use only such characters and structures as are readily accessible, plainly visible and clean cut; in other words, to be clear. The use of abstruse or hidden characters hard to put into words, such as genitalia, trichobothria, intestinal caeca, hami in the hind wings, venation of hind wings, etc., has been avoided. Such characters in themselves are taxonomically perfectly valid and are in no way questioned, but they demand special techniques, not commonly known; they are time-wasting; and at best uncertain

except in the hands of the most expert entomologists.

The arrangement of the genera and species follows closely, Van Duzee's 1917 Catalogue. Species within genera may be systematically arranged in the collection in their linear order according to Van Duzee, or according to any monograph since that date. Nomenclature also adheres closely to this Catalogue.

The author is indebted to the many writers past and present, whose works have so largely helped in the preparation of these, and are sincerely acknowledged. These were Stal, Horvath, Uhler, Barber, Van Duzee, Parshley, McAtee, Malloch, Blatchley and De la Torre Bueno, men whose pioneer work laid the broad foundation on which their successors may build.

II. LIST OF SPECIES RECORDED FROM QUEBEC.

Graphosomatinae

Podops cinctipes Say.

Podops parvulus Van Duzee.

Pentatominae

Sciocoris micropthalmus Flor.

Brochymena arborea Say.

Brochymena quadripustulata Fabricius.

Peribalus limbolarius Stal.

Peribalus piceus Dallas.

Trichopepla semivittata Say.

Chlorochroa uhleri Stal.

Mormidea lugens Fabricius.

Euschistus euschistoides Vollenhoven.

Euschistus tristigmus Say.

Euschistus variolarius Palisot de Beauvois.

Euschistus ictericus Linnaeus.

Coenus delius Say.

Hymenarcys nervosa Say.

Neottiglossa undata Say.

Neottiglossa trilineata Kirby.

Cosmopepla bimaculata Thomas.

Menecles incertus Say.

Thyanta custator Fabricius.

Acrosternum pennsylvanicum De Geer.

Acrosternum hilaris Say.

Banasa dimidiata Say.

Banasa calva Say.

Acanthosomatinae

Meadorus lateralis Say.

Elasmostethus cruciatus Say.

Elasmostethus atricornis Van Duzee.

Asopinae

Perillus bioculatus Fabricius.

Perillus bioculatus clanda Say.

Perillus circumcinctus Stal.

Perillus exaptus Say.

Apateticus cynicus Say.

Apateticus bracteatus Fitch.

Podisus maculiventris Say.

Podisus serieventris Uhler.

Podisus modestus Dallas.

Podisus placidus Uhler.

Zicrona caerulea Linnaeus.

III. HABITS

A. Food habits.

The members of this family vary greatly in their habits; some are injurious to vegetation, others are predaceous; while some species feed indifferently upon animal or vegetable matter. The pentatomids with slender beaks are usually plant feeders, but sometimes attack insects. The strong-beaked forms are predaceous, and some are remarkably helpful in reducing the number of injurious insects.

With the exception of the Asopinae, the pentatomids occurring in our region are mostly phytophagous insects. We find these bugs generally on weeds such as mullein, goldenrod, buttercup, etc.. The principal species recorded in cultivated lands are Euschistus euschistoides Voll., Cosmopepla bimaculata Thomas and Acrosternum hilaris Say, but few of them are numerous enough at any one time and place to do much damage to vegetation. Our most common forest bugs are Meadorus lateralis Say and Elasmostethus cruciatus Say which usually attack spruces, birches balsam firs and aspens.

The majority of species belonging to the subfamily Asopinae are carnivorous at least in the adult stage. Perillus bioculatus Fabr., Perillus bioculatus clanda Say, Perillus circumcinctus Stal and Podisus maculiventris Say prey usually on the Leptinotarsa dicemlineata Say and Diabrotica vittata Fabr. The European spruce sawfly and Diprion polytomum are destroyed by

Podisus serieventris Uhler. The bugs Podisus modestus Dallas and Podisus placidus Uhler feed on lepidopterous larvae such as the white-marked tussock moth and the tent caterpillar.

As the feeding habits vary considerably within the family, it is therefore not surprising to find variations in the characters of the mouth parts. In general, one extreme is to be found among the predaceous forms and the other among those that exist largely on the juices of plants. In the former, the labium is usually quite conspicuous, well developed, stout, and not deeply buried between the bucculae at its base. The plant-feeders have a labium of a very much more slender type and the first segment normally deeply buried between the bucculae, rendering the whole structure very much more conspicuous than the former type. (see Pl. 2)

The labium of the pentatomids is four-jointed. The four setae, the mandibles and maxillae are normally not exposed when the insect is not feeding. It is the setae only that pierce and enter the host tissue whether plant or animal, when the bug feeds. Baker in his remarks on the feeding process of the Pentatomidae says: " Among the plant feeding pentatomids the position of the rostrum during the initial and final movements of the feeding operation is normally more nearly vertical than is found among the predaceous species. In mandibulate insects the general differences between the positions of the mouth-parts in relation to the rest of the head, resulting in a tendency toward a "horizontal" head amongst predaceous forms and a "vertical" arrangement amongst plant-feeders, are well known, In the pentatomids, while

there is no noticeable difference in the general position of the beak between these two types when not feeding, the tendency is for the food to be taken into the head on the horizontal plane in one case and in the case of the phytophagus type on the vertical plane."

B. Defensive habits.

When handled or disturbed all exude a liquid having a characteristic desagreable odor and taste, whence the common family name "the stink bugs." This nauseous odor is caused by a fluid which is excreted through two openings, one on each side of the lower side of the body near the middle coxae. In the nymphal stages, the openings of these odoriferous glands are situated on the dorsal side of the abdomen. This volatile substance emitted by the bugs is supposed to render them more or less immune from the attacks of birds etc..

C. Life history.

In our district, the pentatomids hibernate in the adult stage. Following hibernation, and after both sexes have had their first meal, the bugs often copulate. The natural position for the insects to assume in coitu would be posterior to posterior, facing in opposite directions with the caudal extremities of their abdomen in contact. It was frequently noticed that the insects could be found in coitu a great deal when feeding. The length of time these insects remain connected appears to vary a great deal. It was observed that some did not remain together longer than twenty minutes while others

remained in this relation the better part of an afternoon.

Their eggs are deposited on or near the host plant. The period of incubation varies greatly with temperature and species. The process of hatching in the case of Perillus bioculatus Fabr. for instance, requires about 10 to 12 minutes from the time that the nymph can be seen cutting the lid at the top of the egg.

The newly emerged nymph soon moves to one side of the egg mass and remains huddled quietly with other newly hatched members. This gregarious habit is very pronounced usually among nymphs in the first three instars, but in later stages the individuals become more or less scattered among the plants. After hatching, the young moult or change the outer skin four or five times, at intervals of a few days each, to become adults. Growth is thereby permitted, the wing pads and body after each moult become one size larger and aside from size and absence of wings, there is usually but a slight difference to be noted between nymphs of the last two stages and the adults. In our province, there is only one generation for most species, the adults overwintering.

IV. GENERAL ANATOMY.

In order to make possible a better understanding of the structural characters used in the keys, I will describe briefly the general morphology of the family Pentatomidae. Plate 1 illustrates the structures described below.

The form of the body presented by the great majority of the members of this family is well known. It is broad, short, and but slightly convex; the head and prothorax form a triangle. The scutellum is usually narrowed behind: it is large, and in a few forms nearly covers the abdomen. The tibiae are unarmed or are furnished with very fine short spines.

A. The head.

The head is usually porrect, triangular, much narrower and shorter than the thorax; margins of head are carinate above insertion of antennae. The sclerites of the head capsule are solidly fused together making it impossible to do more than to describe the general regions of which the head is composed.

The occiput lies behind the ocelli and forms the posterior portion of the head surrounding the occipital foramen. The vertex comprises the dorsal region in front of the occiput. The clypeal region includes four distinct areas. They are: the anteclypeus, the postclypeus and two paraclypeal areas. The anteclypeus, the tylus of systematists, is a well marked area. The paraclypeal areas extend along each side of the clypeus and they have been termed the jugae. The jugae are not united

with the clypeus except at their bases where they fuse with the head capsule.

The antennae are as long as the head and five jointed, the first joint or scape thickened, the second slender. The compound eyes are large and project prominently from the head. The ocelli are present and two in number.

The ventral margins of the maxillary plates are bent at an angle forming a pair of projections which have been termed the bucculae. The caudal margins of the maxillary plates are united with each other without trace of suture, forming a continuous sclerotized plate ventral of the occipital foramen. This area is called the gula, although a true gula does not occur in this order. Below the eyes and between the juga and gula are the genae or lower cheeks.

The rostrum or beak as it is called in this work, is to the bug the most necessary external appendage of the head. It is attached to the lower front part of the head, close to the tip of the tylus. The first segment of rostrum is usually slender and not free, but the members of the subfamily Asopinae have the first joint of the beak largely free and relatively short and thick, only its base lying between the bucculae. Tha labium is an elongate tube-like structure and contains a dorsal groove in which lie the four long and lace-like stylets. The labium

when not in use, is carried close to the ventral portion of the thorax between the legs, The labrum is an elongate triangular sclerite. Its anterior surface is convex, while its posterior surface is flat and contains a groove which lies above the groove on the basal half of the anterior surface of the labium. As is usual, maxillary and mandibular setae form the sucking tube, the two pairs lying in a groove in the labium which forms the beak, the maxillae being enclosed within the mandibles. The maxillae then are represented by the inner pair of setae, the mandibles by the outer.

B. The thorax.

The prothorax of the bug has usually its entire dorsal surface, and sides in great part, covered by a large piece known as the pronotum. This is subhexagonal, its front portion more or less declivent, lateral angles usually prominent often spinose. The anterolateral margins of the pronotum are dentate and sometimes straight. On the upper surface of the front lobe, are often two slightly elevated, usually smooth areas known as callosities or calli. The pleuron is divided into the epimeron and episternum. The sternum is a small area lying between and anterior to the coxal cavities, and is indistinguishably fused with the pleuron. The portion of the sternum projecting backward between the coxal cavities is called the mucro.

The mesothorax and metathorax, the second and third segments of the thorax, are, in the bug, rather firmly united with the basal abdominal segment . Lying immediately above the meso-

thorax is the mesoscutum, which is usually covered by the hind lobe of pronotum and base of outer wings. To the mesothorax and the metathorax are attached the two pairs of wings and the second and third pairs of legs.

On the inner end of the metapleuron and near the hind coxa there is present on its side a small opening known as the osteole. This osteole is the external orifice of the stink gland. The visible portion of the osteole varies in form. Sometimes the rim of the opening is expanded to form an auricle as in the genus Euschistus Dallas or is prolonged outwardly as an open canal-like duct as in the genus Peribalus Mulsant & Rey.

Behind the pronotum and lying above the meso- and metathorax and between the bases of the outer wings is the scutellum. This extends beyond the middle of the abdomen and is usually flattened and narrowed behind to form a triangle except in the Graphosomatinae which have a U-shape scutellum. The lateral margins of the scutellum are furnished with a ridge known as the frenum which reaches or extends beyond the middle of the scutellum.

1. The wings.- The front wings are characteristic of the suborder Heteroptera being partly coriaceous and partly membranous. The coriaceous portion is marked off into three areas by two longitudinal sutures. These areas are as follow: the clavus, which lies next to the mesoscutellum when the wings are in repose, the corim which lies between the sutures, and the embolium which lies beyond the second suture. The terminal portion is membranous and is called the "membrane". The inner wings are

wholly membranous and distinctly veined, but are little used in classification.

2. The legs.- The legs are composed of five segments: coxa, trochanter, femur, tibia and tarsus. The tibiae are not strongly spinose but sometimes bear very small spines or a more or less hair-like vestiture which may have a spinose appearance. The hind tibiae are often sulcate above throughout their length. The tarsi are usually three-jointed. The members of the subfamily Acanthosominae are excepted from the general rule by possessing two-jointed tarsi. The claws are all apical and the last tarsal segment is entire. The claws have attached to their bases a pair of slender appendages known as arolia.

C. The abdomen.

The abdomen is broadly joined to the thorax and its anterior portion is overlapped by the metathorax, to such an extent that the spiracles situated in the pleural region of the first abdominal segment, the second morphologically, are completely hidden beneath the metapleuron. The abdomen comprises ten somites. The side margins of the abdomen are more or less flattened and expanded to form the connexivum. The spiracles are almost always on the ventral surface and equally or almost equally distant from the sensory hair on all sternites. The sensory hair near the spiracles are not closer to the median line on the first and second visible sternites than on the others. In the subfamily Acanthosomatinae, the abdomen has a prominent median carina, the sharp curved apex of which extends

forward between the hind coxae and overlaps the apex of the sternum while in the tribe Halyini, the abdomen has a shallow lengthwise median groove. Sometimes the second ventral segment is produced anteriorly toward or between the hind coxae at the middle in a stout spine as in the genus Acrosternum Fieber, and sometimes the second ventral is convexly prominent at middle but not produced forward in a stout spine as in the genus Peribalus.

The sexes are readily distinguished, the external genitalia of the males consisting of several curiously formed hooks covered wholly or in great part by a convex genital plate, while in the female, there are several smaller plates fitted closely together.

V. KEYS FOR THE IDENTIFICATION OF THE PENTATOMIDAE. OF QUEBEC. (HEMIPTERA-HETEROPTERA).

These keys are arranged in the form of pure dichotomies, that is, in directly contrasting couplets. They are also on a uniform plan. The given order of the structures as named is the same in each of the two members of a couplet.In some long keys next to the serial number of the couplet there is another number in parentheses; this is the number of the antecedent couplet which led to this point. This is given to make it simple and easy to go back to the antecedent couplet for any purpose.

Keys to sub-families, tribes, genera and species.

FAMILY PENTATOMIDAE Leach. (key to sub-families).

1. Scutellum subtriangular (Pl. 7, fig. 1), rarely approaching tip of abdomen; frena always distinct; corium with opaque portion broad and subtriangular.....2

Scutellum oblong U-shaped (Pl. 7, fig. 2), its apex broadly rounded, nearly or quite reaching tip of abdomen, but not covering the basal portion of corium; frena absent or very short; corium with opaque portion narrow, triangular.....Graphosomatinae Jakovlev.

2.(1) Tarsi 3-jointed (Pl. 5, fig. 6); sternum without a ridge..... 3

Tarsi 2-jointed (Pl. 5, fig. 7); sternum with a ridge (Pl. 8, fig. 1)..... Acanthosominae Mulsant and Rey.

3. (2) Segment 1 of rostrum slender, not free, lying within the groove between the bucculae (Pl.2, fig. 2).....
.....Pentatominae Stal.

Segment 1 of rostrum stout, free, directed always from the head, only its base lying between the bucculae (Pl. 2, fig. 1).....Asopinae Spinola.

SUB-FAMILY GRAPHOSOMATINAE Jakovlev.

GENUS Podops Laporte.

1. Second, third and fourth segments of antennae darker; lateral tooth of pronotum obtuse; margin of pronotum between apical and humeral projections distinctly not deeply sinuate; anterior edge arcuate; middle of abdomen sparsely, irregularly punctate; disk of the venter posteriorly more nearly smooth; larger, 6.55 mm.....
.....cinctipes Say.

Second, third and fourth segments of antennae paler; lateral tooth of pronotum acute; margin of pronotum between the projections straight; anterior margins rectilinear, continuous with the latero-anterior margin of the pronotum; abdomen deeply and uniformly punctate throughout; disk of the venter strongly punctured to the apex; smaller, not over 5.5 mm.....
.....parvulus Van Duzee.

SUB-FAMILY PENTATOMINAE Stal. (key to tribes)

1. Head not flat above, narrower than base of scutellum

or if nearly as wide , not flat above; scutellum narrowed behind; body not extremely flat and its margins not uniformly flattened.....2

Head flat above, about as wide as scutellum; scutellum broad, but slightly narrowed apically; body very flat, regularly oval, all the margins explanate.....
.....Sciocorini Amyot & Serville.

2.(1) Head very long, its sides not, or but slightly sinuate in front of eyes; juga laterally toothed near the apex; side margins of pronotum usually with numerous coarse teeth; abdomen with a shallow lengthwise median groove.
.....Halyini Stal.

Head shorter, its sides more or less sinuate in front of eyes; juga not toothed laterally near the apex; side margins of pronotum usually unarmed; abdomen usually without trace of median groove.....Pentatomini Stal.

TRIBE HALYINI Stal.

GENUS Brochymena Amyot & Serville.

1. Juga subequal to the tylus, if longer never by one half of the width of one juga at that point; humeral projections of pronotum subquadrate; front side margins of pronotum with four or five rather large triangular teeth and one or two smaller ones between them (Pl. 3, fig. 2).....arborea Say.

Juga distinctly longer than the tylus, exceeding it by

at least the width of one juga at that point; pronotum with humeri obtusely triangular; front side margins with 6-10 teeth, these shorter and more irregular in length (Pl.3, fig.1).....
.....quadripustulata Fabricius.

TRIBE PENTATOMINI Stal. (key to genera).

1. Ventral segment 11 produced anteriorly between hind coxae at middle in a stout spine or well defined tubercle (Pl. 8, fig. 1).....12.

Ventral segment 11 sometimes convexly prominent at middle, but not produced forward in a stout spine or tubercle.....2

2.(1) Osteolar opening without a distinct auricle, but extended as a narrow tapering evanescent canal (Pl. 5, fig. 4).....3

Osteolar opening usually with a short curved auricle having a rounded tip, but not extended as a canal, or if so, the canal short and ending abruptly (Pl. 5, fig. 3).....6

3.(2) Cheeks distinctly longer than tylus and usually contiguous in front its tip; pronotum with narrow smooth ivory-white margins.....peribalus Mulsant & Rey.

Cheeks not or scarcely longer than tylus; sides of pronotum not edged with white.....4

4.(3) Frena not reaching middle of scutellum.....5

Frena exceeding midscutellum.....Trichopepla Stal.

5.(4) Scutellum reaching apical third of abdomen gradually narrowing from the base; osteolar canal long, narrowing and continued as a ridge to outer front angle of its supporting plate.....Thyanta Stal.

Scutellum with apical half rapidly tapering to a rounded apex; osteolar canal short, tapering, not reaching the middle of its supporting plate.....Chlorochroa Stal.

6.(2) Scutellum shorter than corium, its apical third narrower than apex of corium (Pl.7, fig.5).....7

Scutellum equal to or longer than corium, its apical third equal or wider than apex of corium (Pl. 7, fig.6).
.....10

7.(6) Hind tibiae not sulcate or grooved above throughout their length.....Mormidea Amyot & Serville.

Hind tibiae sulcate above throughout their length....8

8.(7) Side margins of pronotum crenulate; humeral angles prominent, usually acute or acuminate...Euschistus Stal.

Side margins of pronotum not crenulate; humeral angles obtusely rounded.....9

9.(8) Margins of front half of pronotum not strongly flatened;

beak not passing hind coxae; frena reaching middle scutellum; length, less than 10 mm.....
.....Hymenarcys Amyot & Serville.

Margins of front half of pronotum strongly flatened; beak reaching second ventral; frena surpassing middle of scutellum; length, 12 or more mm..Menecles Stal.

10.(6) Head either declivent or strongly deflexed; tylus scarcely elevated above level of cheeks.....11

Head porrect or nearly so; tylus strongly convex, distinctly elevated above surface of cheeks.....
.....Coenus Dallas.

11.(10) Head almost as broad as base of scutellum; cheeks longer than tylus; colour not black with red or yellow markings.....Neottiglossa Kirby.

Head much narrower than base of scutellum; cheeks not longer than tylus; colour black with red or yellow markings.....Cosmopepla Stal.

12.(1) Second antennal joint more than half the length of fifth; colour usually clear green; length, 14 or more mm. (Pl.5, fig.2).....Acrosternum Fieber.

Second antennal joint less than half the length of fifth (Pl.5, fig.1); colour olivaceous green or darker; length, not over 11 mm.....Banasa Stal.

GENUS Peribalus Mulsant & Rey. (key to species).

1. Tip of scutellum narrowly rounded; connexivum with a narrow pale outer border; under surface and legs pale. .....limbolarius Stal.

Scutellum wider, its tip broadly rounded; connexivum with black spots on the incisures reaching nearly to the edge; under surface and legs piceous..... .....piceous Dallas.

GENUS Euschistus Dallas. (key to species).

1. Pronotum with a line connecting lateral angles (Pl. 6, fig.1).....ictericus Linnaeus.

Pronotum without this line.....2

2.(1) Jugum no longer than tylus.....3

Jugum distinctly longer than tylus..... .....euschistoides Vollenhoven.

3.(2) Lateral margin of abdomen with dark spots at each incisure.....tristigmus Say.

Lateral margin of abdomen without black spots..... .....variolarius Palisot de Beauvois.

GENUS Neottiglossa Kirby. (key to species).

1. Head wholly black, feebly bronzed, deeply and densely punctate; vertex without a pale line; third antennal segment 5/6 the length of the second..trilineata Say.

Head not black, rather finely, not densely and deeply punctate; vertex with a narrow median pale line extending backward on the pronotum; third antennal segment ¾ the length of the second.....undata Kirby.

GENUS Acrosternum Fieber. (key to species)

1. Short, oval; cheeks exceeding tylus; lateral margins of pronotum arcuate; spiracles black; length, 13.5 - 14.5 mm.; width, 9.- 9.5 mm...pennsylvanicum DeGeer.

Elongate-oval; cheeks equalling tylus; lateral margins of pronotum straight; spiracles pale brownish; length, 14.- 19.mm.; width, 8.-10 mm.....hilaris Say.

GENUS Banasa Stal. (key to species).

1. Head not narrowed anteriorly; second joint of antennae not more than half the length of third; incisures at ends of ventral segments without a black spot..... .....dimidiata Say.

Head distinctly narrowed anteriorly; second joint of antennae three-fourths the length of third; incisures at ends of ventral segments with a black spot..... .....calva Say.

SUB-FAMILY ACANTHOSOMINAE Stal. (key to genera).

1. Posterior side margins of pronotum depressed and ampliated; posterior angles of the pronotum angularly projecting posteriorly; outer hind angle of sixth ventral not strongly produced backward; metasternal

orifice with a short, broadly rounded canal. (Pl. 8, fig. 5).....Meadorus Mulsant & Rey.

Posterior side margins of the pronotum neither depressed nor ampliated; posterior angles of the pronotum obtuse; metasternal orifices with a long gradually tapering canal; outer hind angle of sixth ventral acute, strongly produced backward (Pl. 8, fig.3).....
.....Elasmostethus Fieber.

GENUS Elasmostethus Fieber. (key to species).

1. Antennae pale except the more or less darker apical; humeral angles pale.....cruciatus Say.

Antennae piceous or shining black with the incisures pale; humeral angles black.....atricornis Van Duzee.

SUB-FAMILY ASOPINAE Spinola. (key to species).

1. Side margins of pronotum crenate or subserrate; front femora without spine or tubercle; male without pubescent spot on ventral 4-6.....2

Antero-lateral margins of the pronotum with a distinct carina; front femora armed beneath at apical third or fourth with a short spine or acute tubercle; ventral 4 - 6 male with a large oblong silky pubescent spot each side of middle.....Perillus Stal.

2.(1) Second ventral with a distinct slender median spine projecting forward to or between the hind coxa (Pl.8,

figs. 4 and 6); colour not blue..... 3

Second ventral unarmed; colour dark metallic blue...
.....Zicrona Amyot & Serville.

3.(2) Tylus generally shorter than juga (Pl. 4, fig.2) ; male with abdominal stridulatory areas; length, usually over 13 mm.....Apateticus Dallas.

Tylus as long as juga (Pl. 4, fig.1); abdominal stridulatory area absent; length, usually less than 13 mm.
.....Podisus Herrick-Shaeffer.

GENUS Perillus Stal. (key to species).

1. Front femora armed with a distinct spine; transverse bar of front half of pronotum interrupted forming two spots (Pl. 6, fig.2); larger, length, 8.5 - 11.5 mm.; width, 5.5 - 7. mm.....2

Front femora armed with a blunt tubercle in place of a spine; transverse dark bar of pronotum entire (Pl. 6, fig.3); smaller, length, 5. -7.5 mm.; width, 4.5-5.mm.
.....exaptus Say.

2.(1) Antennae black, only basal joint and incisures pale; abdominal segments with a row of black spots.....3

Antennae fuscous, first two joints and basal half of third reddish-yellow; abdomen without rows of dark spots,.....circumcinctus Stal.

3.(2) Black with red markings; elytra black, the basal half of costal boarder red.....bioculatus Fabricius.

Rufous or chestnut brown; elytra ivory-white with the narrow inner margin and a median triangular spot black. .....bioculatus Fabr. var. clanda Say.

GENUS Apateticus Dallas. (key to species).

1. Anterior lateral margins of pronotum more distinctly serrulate; pronotal spines shorter (Pl. 6, fig. 7) ; pronotum with six small green dots, four in a transverse row, the other two behind the end ones of the row; connexivum rather widely exposed..... .....bracteatus Fitch.

Anterior lateral margins of pronotum very finely serrulate; pronotal spines long and more acute (Pl. 6, fig. 6); pronotum with two or three greenish dots behind the front angles; connexivum narrowly or not at all exposed.....cynicus Say.

GENUS Podisus Herrick-Shaeffer. (key to species).

1. Lateral angles of pronotum usually projecting, more or less spine-like, and side margins of pronotum more or less concave (Pl. 6, fig.4); membrane with a dark blotch at apex.....2

Lateral angles of pronotum rounded, and side margins of pronotum straight (Pl. 6, fig.5); membrane without a dark blotch.....placidus Uhler.

2.(1) Ventral spine reaching middle of hind coxae, its apex rounded (Pl. 8, fig. 6).....maculiventris Say.

Ventral spine short, not reaching hind coxae (Pl. 8, fig. 4).....3

3.(2) Antennae reddish-brown, the third and fourth joints in great part fuscous; femora thickly flecked with purplish dots; larger, 10 mm. or more.....serieventris Uhler.

Antennae reddish-yellow, the tips of joints fourth and fifth often fuscous; femora without purplish dots; smaller, less than 10 mm.....modestus Dallas .

VI. SYNONYMY, GENERAL CHARACTERS, HABITAT AND DISTRIBUTION.

The synonymy follows closely the check list of the Hemiptera of America, North of Mexico, by E. P. Van Duzee and the sources of references are indicated with each variation.

The general characters mentioned in this section are only those which serve to separate one species from another, and they represent the characters which would have been too long to be included in the key.

Following the description of each species are notes on its local habitat, general distribution, food habits, etc.. These notes are based not only upon my field accession notes, but also on the data accompanying specimens which have been loaned me for study and on the published local lists and other works cited in the bibliography near the end of this paper.

The distribution is given by the name of the county where a specimen was taken. This is done in order to know rapidly the region where a specimen may be found. The data of the distribution and the dates of occurrence were recorded from my own specimens and from those I checked in different collections. I worked with the collections of the Quebec Plant Protection Division, Quebec Forest Inspection Service, Quebec Provincial Museum, McGill and Montreal Universities and with Brother Ouellet's and Provancher's collections. All the records are not listed here but only those which may serve to indicate the region where a species may be found and to show approximately the actual time of the appearance or the disappearance of the imago.

PENTATOMIDAE Leach, 121, 1815.

Leach, Brewster's Edimb. Encyc, : 121, 1815, Pentatomides.

Stephens, Cat. Br. Inst., 11, : 337, 1829, Pentatomidae.

Antennae as long as or longer than the head, five segmented; first segment of the antennae thickened, second slender; head usually porrect, triangular much narrower and shorter than thorax; margin of head carinate above insertion of antennae; ocelli present; pronotum subhexagonal, its front portion more or less declivent, lateral angles usually prominent often spinose; scutellum extending beyond middle of abdomen, usually flattened and narrowed behind to form a triangle: its lateral margins each furnished with a frenum reaching or surpassing its middle; corium with an opaque portion broad and subtriangular; tarsi two or three jointed; tibiae not strongly spinose but sometimes bear very small spines or a more or less hair-like vestiture which may have a spinose appearance; claws all apical, last tarsal segment entire; presence on the sternites near the spiracles, of sensory hair which are not closer to the median line on the first and second visible sternites than on the others; the spiracles are almost always on the ventral surface and equally or almost equally distant from the sensory hair on all sternites.

This family is represented in our fauna by four different subfamillies, 20 genera and 39 species.

A. Sub-family Graphosomatinae Jakovlef 204, 1884.

Jakovlef Horae Soc. Ent. Ross, XV11,:204,1884,sf.Graphosamini.

A group of moderate extent, represented in our fauna by a single tribe and genus. Dallas and Blatchley have raised this group to a family rank. These authors base their opinions upon the form of the scutellum and the absence of frena and they concluded that these characters are fixed and striking and of greater taxonomic value than those separating many families of Coleoptera. This opinion seems undeniable, and in the beginning of this work, I intended to follow the statements of these authors, but after more careful studies, I agree now with Torre-Bueno, Parshley and many authors in placing this group in the family Pentatomidae.

Why multiply the number of families when the identification is clear without any other divisions? We must not forget that the Pentatomidae belong to the superfamily Scutelleroidea, and I do not see any reason to place a family Podopidae just after the family Scutelleridae instead of including it as the first sub-family of the Pentatominae.

Moreover, if we raise this group to a family rank on account of the form of its scutellum, where will we place the genus Stiretrus Laporte, in the subfamily Asopinae, which has also an U-shaped form ? Due to the shape of the scutellum, the frenae are absent, but in the remainder of the Pentatomidae, we remark that the length of the frenae is also very variable.

So far as the form of the pronotum is concerned, my opinion

is that it ressembles that of the Pentatominae more than any other group in the superfamily Scutelleroidea.

The form on the whole, excepting the scutellum looks more like a Pentatomid than a Scutellerid. Podops and the other Pentatomids are of oblong-oval subdepressed form and the head porrect while the Scutellerids are usually oval strongly convex form and the head triangular and not porrect.

The habitat of the species of Podops is not very different from that of the members of the family Pentatomidae which are usually found near water and feed on shrubs, small trees and weeds.

For all these reasons I place this group as the first subfamily of the Pentatomidae.

1 : Tribe Podipini Dallas, 51, 1851.

Dallas, List of Hemip., 1,: 51, 1851, Podopidae.

Rather small insects having a tooth just in front of the lateral pronotal angles which thus appear emarginate. Represented in our fauna by only one genus.

a) Genus Podops Laporte, 72, 1832.

Orthotype inunctus Fabr.

Laporte, essai Classif. Syst. Hemip.,: 72, 1832.

A small genus of inconspicuous species, having the anterior pronotal angles produced in an acute tooth near the eyes. Head longer than wide, narrower in front of eyes; tylus strongly

convex, forming a distinct ridge along its middle; cheeks flattened, thin, a little longer than tylus; antennal tubercles prominent beyond sides of head, armed on the outer side with a curved spine; margin of pronotum in front of tooth feebly sinuate or straight; pronotum about one-third longer than head. divided transversely near middle by a rather wide, ill defined groove, the front portion declivent, much the narrower, and bearing three obtuse tubercles in front of which is a second narrow less distinct groove or furrow; eyes prominent, subpedunculate.

Two species are known from the Province of Quebec. These species occur along the margins of ponds or streams.

i) Podops cinctipes Say, : 43, 1828

Say, Am. Ent.,111,pl.43, 1828; Compl. Writ.,1,:94, Tetyra.
Stal, Of. Vet. Akad. Forh.,XXlV,:502, 1867, Scotinophara.
Uhler, Check List,: 5, 1886, Podops.
Kirkaldy, Cat. Hemip.,:237, 1909, Amaurochrous.
dubius Germar, Zeit.F.Ent.,:64,1839,Podops.(cited in error)

A dark brown, densely punctate species. Margin of pronotum between apical and humeral projections distinctly not deeply sinuate; lateral tooth of pronotum obtuse; middle of abdomen sparsely irregularly punctate; disk of the venter posteriorly more nearly smooth; outer apical angles of male genitalial plate produced and visible from above beyond the apex of the scutellum.

It is not as scarce as parvulus, but it is not common in our fauna. They are generally taken under stones, and in beach drift.

Montreal, 5 June, 1932; 3 May, 1936; 10 April, 1937; Berthier, 3 May, 1934; 24 May, 1938.

ii) Podops parvulus Van Duzee, 22, 1904.

Van Duzee, Trans. Am. Ent. Soc., XXX,:22, 1904, Podops.
Schouteden, Op. cit.33, pl.3.fig.13, 1905, Amaurochrous do.
Kirkaldy, Cat. Hemip.: 237, 1909, Amarochrous.

Margin of pronotum between the projections straight, anterior margins of pronotum rectilinear continuous with the latero-anterior margin; lateral tooth of pronotum acute; entire abdomen deeply and uniformly punctate throughout; disk of the venter strongly punctured to the apex; outer apical angles of male genital plate short, obtuse, not visible from above.

This species is very rare in Quebec, but we have some specimens taken from Roberval and Montreal to attest its occurrence. The specimens were taken in a wet situation and under stones.

Montreal, 5 June, 1932; 2 April, 1937; 7 April, 1936; Roberval 10 May, 1936; Laval, 10 June, 1936.

B. SUBFAMILY PENTATOMINAE (Stal), 32, 1864

Stal, Hemip. Afr., 1, : 32, 76, 1864.
Stal,of. Vet,Akad, Forh.,XXlX,No.3,:32,1872,sf.Pentatomina.
Puton, Oat.Hemip. Palae.,Edn.3,:9,1886,tr.Pentatomini Macropeltidae.
Fieber, Europ. Hemip.,:26, 77, 327, 1861, (as family).

This subfamily contains the large majority of our stink-

bugs. They vary much in size and appearance, but agree in having the body more or less oval and subdepressed; bucculae parallel, not united posteriorly; base of beak distinctly separated from end of tylus; segment 1 of rostrum not free, lying within the groove between the bucculae, at least posteriorly; sternum without a ridge or a carina; tarsi always three segmented; scutellum usually subtriangular, more or less narrowed apically, generally shorter than the corium.

Six tribes of the subfamily are recognized as being represented in North America. Of these three occur in the Quebec.

1. Tribe Sciocorini Amyot & Serville 118, 1843.

Amyot & Serville, Hemip.,:118, 1843. Groupe Sciocorides.
Stal, Of. Vet. Akad. Forh.,XXIX,:35, 1872. Div. Sciocoraria.

Body very flat, regularly ovate, broadest behind middle, margins all explanate; head flat above with a thin dilated margin, about as wide as scutellum; scutellum broad, scarcely narrowed apically; sides of tergum rather broadly exposed.

a) Genus Sciocoris Fallen, 20, 1829.

Haplotype umbrinus (Wolff) : cursitans (Fabr.)

Fallen, Hemip. Suec. Cimic., : 20, 1829.

Small, broadly oval strongly flattened species having the head as wide as base of scutellum; juga meeting in front of tylus; ocelli very small; pronotum with side margins broadly

rounded; scutellum reaching the middle of the dorsum with its apex rounded; connexivum very wide almost wholly exposed.

1) Sciocoris microphthalmus Flor, 114, 1860.

Flor., Rhyng. Livl., 1, : 114, 1860.

umbrinus Fieber, Rhyngotog.,:16, 1851.(preoccupied name)

curtipennis Mulsant & Rey, Punaise de France, Pent.,:105, 1866.

Yellowish brown species having the connexivum spotted; antennae reddish-brown, the apical joints darker; legs yellow, dotted with fuscous; membrane usually slightly exceeding tip of abdomen; connexivum alternated with dull yellow and fuscous; membrane usually slightly exceeding tip of abdomen.

This species is very little known in our province and only two specimens were recorded. It was found along the edge of a woodland stream.

Joliette, 15 August, 1913; Terrebonne, 10 August, 1920.

2. Tribe Halyini (Stal), 35, 1872.

Stal, Of. Vet. Akad. Forh.,XXIX,No.3,:35,1872.Div. Halyaria.

This tribe is represented by only one genus in North America. This is the Brochymena of Amyot and Serville. The species of this tribe have the head elongate, and body not extremely flat and explanate; juga laterally toothed near apex; anterolateral margins of pronotum usually with coarse teeth; rostrum extending behind posterior coxae; antennae inserted at a considerable distance in front of the eyes; abdomen ventrally sulcate.

a) Genus Brochymena Amyot and Serville, 106, 1843.

Haplotype serrata Amyot & Serville,:4-pustulata (Fabr.).

Amyot & Serville, Hemip, : 106, 1843.

In this group cheeks are flattened or slightly concave; juga with lateral tooth near the apex; side margins of pronotum with 4-8 strong teeth; under surface with a median groove, distinct and deep the length of beak, then gradually evanescent and obsolete on fifth or sixth ventral.

They are commonly known as "true bugs".

1) Brochymena arborea (Say), 311; 11, 239, 1825.

Say Compl. Writ., 11,: 239 Pentatoma.

erosa Herrick-Schaeffer, Wans, Ins. V.:70,fig.515, 1839. Halys.

Antennae and legs distinctly banded; juga subequal to tylus, if longer never by one half of the width of one jugum at that point; front side margins of pronotum with four or five rather large triangular teeth and one or two smaller ones between them; each segment of connexivum with a blackish spot across the ends, the middle pale; anterior tibia dilated.

This species is rarely seen within our limits and only a few specimens indicate its presence in our region.

Parasitised by Trissolcus brochymena (Hym.).

Vaudreuil, 20 July 1934; 8 August 1936; Montreal, 15 July 1939; 7 October, 1933; Rouville, 30 June, 1939.

11) Brochymena quadripustulata Fabricius, 1775.

Fabricius, Syst. Ent.: 704, 1775, Cimex.

Fabricius, Syst. Rhyng.,: 182, 1803, Halys.

serrata Palisot de Beauvois,Ins.Rec.Apr.Am.,:18, pl.Hem.11,1805.

pupillata Herrick-Schaeffer,Wanz. Ins.,1V:104,fig.45, 1839, Halys.

quadripunctata Provancher Nat. Can.: 74, 1874.

annulata Uhler, Bul.N.S.Scol. Grog.Surv.,1,:283, 1875

Antennae concolourless; juga distinctly longer than tylus, exceeding it by at least the width of one juga at that point; front side margins with 6-10 teeth, these shorter and more irregular in length than in arborea; each segment of connexivum with two blackish bars; legs rather indistinctly banded; femora and tibiae dull red, annulated with black. More common than arborea and it occurs on the foliage of various trees and shrubs, and in cool rainy weather in summer and fall congregates in small colonies beneath loose bark or other shelter. It rests on the branches of trees protected by its colour. It is noted especially in orchard on apple and cherry trees. This species is also very common under bark of dead pine trees. Sanderson has recorded it as preying on the tussock and brown-tail moths.

Montreal, 2 November, 1924; Rouville, 17 May, 1933; 25 September, 1935; Huntington, 20 September, 1937; Terrebonne, 2 June, 1935; Deux-Montagnes, 17 May, 1933; 9 August, 1932.

3. Tribe Pentatomini Stal, 37, 1872.

Stal, Of, Vet. Akad. Forh., XX1X,:37,1872, Div. Pentatomaria.

This extensive tribe includes a large majority of our penta-

tomid species. This tribe is represented in the Province of Quebec by 13 genera and 20 different species.

In this group, the juga are not toothed laterally near the apex; segment 1 of rostrum resting about parallel to under surface of head, its basal end evidently in front of the middle of the head; side margins of pronotum usually unarmed; metasternum with no more than a simple median carina; abdomen not sulcate; body not over three times as long as its greatest width.

a) Genus Peribalus Mulsant & Rey, 262, 1866.

Logotype vernalis Wolff.

Mulsant & Rey, Punaises de France, Pent.,:237, 262, 1866.

Kirkaldy, Cat. Hemip., 1,: 47, 1909, Holcostethus.

Small oval, subdepressed species, having cheeks distinctly longer than tylus and usually contiguous in front of its tips; pronotum with a narrow smooth ivory-white margins: scutellum nearly equilateral, its apex rounded and with a pale tip; frena exceeding midscutellum: evaporative area well developed; osteolar prolongation reaching half-way or more to the lateral margin of the metasternum.

Five species have been recorded from America, two of which occur in our territory.

i) Peribalus limbolarius Stal, 34, 1872.

Stal, Enum. Hemip., 11 : 34, 1872.

modestus Uhler, Hayden's Surv. Terr.,Rept.for 1871,:396, 1872.

Dull grayish yellow, thickly marked above with fuscous punctures; cheeks usually contiguous in front of tylus; lateral margins of pronotum and of hemielytra at base, connexival margins yellowish white; tip of scutellum white and narrowly rounded; legs and under surface pale.

Frequent throughout Quebec. It feeds on shepherds purse, goldenrod, mullein and hibernates as adult.

Montreal, 25 September, 1934; 5 October, 1938; Deux-Montagnes, 29 September, 1935; 2 October, 1935; Terrebonne, 3 September, 1937; 25 September, 1937; Napierville, 10 May, 1932; Quebec, 5 September, 1934; Levis, 10 September, 1936.

ii) Peribalus piceus (Dallas), 236, 1851.

Dallas, List of Hemip.,1,:236, 1851, Pentatoma.

Above dull brownish yellow, thickly marked with piceous punctures, those in head, front of pronotum and basal half of scutellum larger and more or less confluent, causing these parts to appear almost black in hue; cheeks not contiguous in front of tylus; tip of scutellum white and broadly rounded; connexivum with black spots on the incisures reaching nearly to the edge of legs and under surface piceous.

Nothing regarding its habits has yet been recorded. This species is very rare in Quebec and I saw only one specimen taken by Brother Ouellet : Montreal, 12 May, 1937.

b) Genus Trichopepla Stal, 528, 1867.

Halotype pilipes (Dallas): semivittata (Say).

Stal, Of. Vet. Akad. Forh., XXlV,: 528, 1867.

This genus is characterized particularly by the long fine pubescence on all parts of the body; antennae short, first joint not reaching apex of head, second one-half longer than third, fourth and fifth longer, stouter, subequal; frena not reaching midscutellum; evaporative area very small and ill-defined; body beneath, especially the sides of abdomen distinctly pubescent; cheeks each with a raised pale line along the middle.

i) Trichopepla semivittata (Say), 9, 1832.

Say, Heter. N.Harm.,:9,1832; Compl. Writ.,1,:322, Pentatoma. semivittatum (H.-Schaeffer), Wans.Ins.,Vll,:101,1844, Pentatoma. pilipes (Dallas),List of Hemip.,1.:247, 1851, Pentatoma.

Light to dark brown, more or less suffused and strongly punctured with black; antennal segment 2 obviously longer than 3; head longer than its width across the eyes, apex narrower and more produced, sides appreaching before the anteocular sinus; three lines on head, lateral margins and irregular discal spot of pronotum, and margins and median line of scutellum pale and less strongly punctate; connexivum spotted.

This species is usually found feeding on plants of the family Unbelliferae, mainly the wild carrot. In Quebec however, we know nothing about its havits because we have only one record from M. Chagnon in Montreal and identified by Van Duzee in the Trans. of Am. Ent. Soc. XXX. 1904.

c) Genus Chlorochroa Stal, 33, 1872.

Logotype ligata Say.

Stal, Enum. Hemip.,11,:33,1872,(as subgen. of Lioderma).
Fieber, Europ, Hemip.,:80,336,1861,(in error) Pentatoma.
Provancher, Pet. F.Ent. Can.,111,:41,1885,(in error) Lioderma.
Reuter, Rev. Synom.,:124,55,1888,(haplotype juniperina L.)Pitedia.

Broadly oval species having the anterolateral margins of pronotum distinctly reflexed and the humeral angles rounded with an obtuse nodule above; antennae slender, second joint longest, one half longer than third; beak reaching hind coxae, its second joint as long as third and fourth united.

i) Chlorochroa uhleri Stal, 33, 1872.

Stal, Enum. Hemip., 11, :33, 1872, Lioderma.

flavomarginatus (Kouchakevitch), Horae Soc. Ent. Ross.,1V,99,1867,
Cimex ligata (Fitch),3rd,Rept. Trans.N.Y.St.Agr.Soc.,XV1,:389,1856
ligata (Provancher)Pet.F.Ent.Can.,111,:41,1885, Lioderma.
juniperina Provancher, Pet.F.Ent.Cam.,111:36,1885,(error) Pentatoma.
persimilis Horvath,Ann.Mus.Natl.Hung.,V1,:555,1908, Chlorochroa.

Bright green; lateral margins of pronotum, hemelytra at base, and connexivum pale yellow to bright red; under surface and legs olive green, the tarsi fuscous; apex of scutellum pale or reddish.

Chlorochroa uhleri of Stal is Chlorochroa persimilis of Horvath and Terre Bueno and vice versa. This species is known as "juniper plant bug" it feeds on plants and the adults

pass the winter in sheltered places. It is also noted on pine trees, sunflower seed, green corn, small peas, tomatoes and currants, but especially on willows and junipers.

Montreal, 5 June, 1933; Deux-Montagnes, 2 September, 1940; St-Jean, 27 September, 1936; Rouville, 8 September, 1938; Shefford, 17 September, 1939; Charlevoix, 19 September, 1935; Kamouraska, 12 July, 1939; 10 August, 1939; Quebec, 2 September, 1936; Levis, 2 October, 1937.

d) Genus Mormidea Amyot and Serville, 134, 1843.

Logotype ypsilon Linn.

Haplotype lugens (Fabricius).

Amyot and Serville, Hemip., : 134, 1843.

Small oval or elongate oval subconvex species with more or less strongly projecting eyes; cheeks slightly concave, usually very coarsely punctate, reaching tip of tylus; bucculae not reaching apex of first rostral segment; tibiae not grooved; osteolar opening with a short auricle, but without a canal.

Only one species is found within our limits.

i) Mormidea lugens Fabricius, 716, 1775.

Fabricius, Syst. Ent., 716, 1775, Cimex.

Herrich-Schaeffer, Wanz. Ins., Vll,:96, 1844, Pentatoma.

Kirkaldy, Cat. Hemip.,1,:61, 1909, Melanochila.

albipes Fabricius, Ent. Syst. Sup.,:535,1798, Cimex.(in error).

gamma Fabricius, Syst. Rhung., Emendation at end of volume,1803.

punctipes Palisot de Beauvois, Ins.Rec. Afr.Am.,:113, 1805.

Pentatoma.(Preoccupied name).

Pale brown, with coarse regular black punctation; head, apical third of pronotum and entire scutellum black, faintly bronzed; pronotum before the middle with a narrow abbreviate calloused fascia; scutellum black, with a pale umpunctate marginal line.

Common throughout Quebec, and hibernates as imago beneath shelters. It feeds on the common mullein, on herbage along roadsides, and borders of cultivated fields, espeeially those in dry sandy places. This small stink bug is often found under stones.

Montreal, 24 August, 1936; Vaudreuil, 26 August, 1929; Berthier, 28 August, 1937; Napierville, 20 August, 1938; Rouville, 10 September, 1935; Deux-Montagnes, 25 August, 1940; Rigaud, 19 September, 1937; Shefford, 6 July, 1938; 28 June, 1940; Quebec, 2 September, 1937; Lévis, 4 September, 1937.

e) Genus Euschistus Dallas 201, 1851.

Logotype tristigmus Say.

Dallas, List of Hemip.,1, : 201, 1851.

This genus presents a remarkably uniform appearance, this species being much alike in their inconspicuous brown coloration and boradly oval form; head longer than wide; side margins of pronotum crenulate; humeral angles variable as to species; scutellum shorter than corium and its apex narrowly rounded; all the tibiae are grooved.

This genus is represented in our fauna by 4 different

species and are known as the stink bugs par excellence. The Euschistus species are the least predaceous and it is probable that they naturally feed more upon plants than upon insects.

i) Euschistus euschistoides (Vollenhoven), 180, 1868.

Vollenhoven, Versl.Med.Kon.Akad.Wetens,Amst.,11:180,1868,

Ser. 2, Dicaraeus.

fissilis Uhler, Proc. Bost.Soc.Nat.Hist., XlC,:96, 1871.

Antennae with last two joints more distinctly fuscous; juga distinctly longer than tylus but not meeting in front and forming a deep sinus at apex of head; pronotum with humeral angles usually more broadly rounded; margins of the venter with a minute black point at each incisure; connexivum not at all or very narrowly exposed.

Frequent throughout Quebec and it is one of the more common species of pentatomids in our district. Taken abundantly at any time from the spring to the late autumn and known to feed on many plants: goldenrod, clover, wheat, thistle, alfalfa, tomato, on foliage and flowers of dogwood. In late autumn it is found beneath dead leaves and under bark. It causes the cat-facing in apples and the true black pit of the Pecan.

Montreal, 9 September, 1936; 13 July, 1937; Deux-Montagnes, 12 August, 1938; Rouville, 6 June, 1934; Shefford, 27 May, 1940; 18 June 1940; 20 July, 1940; 8 August, 1940; Brome, 15 June, 1938; Quebec, 8 July, 1940; 12 August 1937; Portneuf, 1 July, 1919; Kamouraska, 3 July, 1940; Charlevoix, 10 September,1937; Abitibi, 17 August, 1935.

ii) Euschistus tristigmus (Say), 4 :1, 314, 1831.
Say, Heter. N. Harm.,:4,1831:Compl.Writ.,1,:314, Pentatoma inconspectus (Westwood), Hope cat.,1:42, 1837.
tristigmus (H.-Schaeffer), Wanz.Ins.,V11:95,101,1844,Pentatoma.
luridus Dallas, List of Hemip.,1:207,pl.7,fig.6, 1851.

Tylus equalling or very feebly surpassing the cheeks; middle of abdomen with from one to four black spots; sides of abdomen often with two rows of vague fuscous spots; connexivum narrowly exposed, each segment fuscous with a rounded dully yellow spot; thoracic pleura coarsely marked with reddish punctures.

Known as the "three spotted stink byg", it feeds on potato, raspberry and many other field crops and plants. Often found on pine, goldenrod, mullein, elder, iris; It lives from egg to imago on fruits of Sambucus canadensis L. (canadian elder). Taken in or along more or less wooded and shady places and moist situations, it hibernates as an adult.

The eggs are parasitised by Telenomus dimmochi Ashm. Preyed on by Dasilis tergissa (Dipt.) and Podisus maculiventris (Hem.). Parasitised by Trissolcus euschistus (Hymn.).

Montreal, 12 June, 1930; 2 July, 1934; Deux-Montagnes, 1 May, 1933; 26 June, 1934; 15 August, 1932; Assomption, 31 May, 1936; 1 July, 1936; Terrebonne, 10 August, 1934; Huntingdon, 15 June, 1930; St-Jean, 7 July, 1937; Shefford, 17 June, 1937; 26 July, 1940; 7 September, 1938; Rouville, 6 June, 1937; Trois-Rivières, 2 June, 1938; Quebec, 6 May, 1938; Levis, 18 May, 1933; Roberval, 20 June, 1935.

iii) Euschistus variolarius Palisot-Beauvois, 149, 1805.
Palisot-Beauvois, Ins. Rec. Afr. Am.,:149, 1805, Pentatoma.

punctipes (Say), Jl. Acad. Nat. Sc. Phila., LV : 314, 1825;
Compl. Writ.,11 : 241. Pentatoma (preoccupied name).
sordidus (Herrich-Schaeffer), Wanz. Ins.,Vl:70,1892, Cimex;
Vll : 95, 1844, Pentatoma: Verz.: 96, 1853.
ictericus (Herrich-Schaeffer),Wanz.Ins.,Vl,:71,1842, Cimex;
Vll, 95, 1844, Pentatoma;Verz.,:85,1853.(in error).

Edge of side margins of thorax and extreme tip of scutellum yellow; antennae reddish-yellow, the fifth joint and apical half of fourth, black or fuscous; cheeks equalling or scarcely reaching tip of tylus; humeral angles acute or subspinose; under surface greenish-yellow and legs brighter yellow, flecked with small brownish spots; connexivum narrowly or not at all exposed.

This species is not common within our limits. It is called the "spined tobacco bug". Often frequent on goldenrod, asparagus, oats, wheat, red clover, raspberries, mullein, tobacco, grasses, thistles and on evening primrose. At the end of the summer, it is observed puncturing the skin of ripening tomatoes. Said to feed on lepidopterous larvae, as well as the sap of plants.

It preys on Pulvinaria innumerabilis (hom.) The overwintering adults are parasitised by three different species of Tachinidae. Gymnosoma fulignosum R.D., Cistogaster immacu-

latus Marg., and Trichopoda pennipes F.

Montreal, 25 August, 1927; Laval, 5 June, 1936; Deux-Montagnes, 12 June, 1931; Berthier, 16 July, 1940; Napierville, 10 September, 1940; Rouville, 4 June, 1938.

iv) Euschistus ictericus Linnaeus, 16, 1763.

Linnaeus, Cent. Ins.,: 16, 1763, Cimex.

Walker, Cat. Heter, 111,: 451, 1868, Aceratodes.

rubrofusca (P.-Beauvois),Ins.Rec.Afr.Am.:185,1805, Pentatoma cognatus Dallas, List Hemip., 1 : 204, 1851.

Head flat, distinctly tapering in front of middle, apex narrowly rounded, cheeks equalling tylus; pronotum with a smooth transverse line between the tips of the humeri; thoracic pleura with four very small black spots; spiracle ring fuscous; abdomen narrowed posteriorly.

This species is not abundant in Quebec, and it is usually taken in the region of Montreal. Usually found in damp situation, where it feeds on Carex, on tall grasses growing about the margins of lakes, or along boarders of streams or other bodies of water.

Montreal, 13 September, 1931; 20 October, 1939; Deux-Montagnes, 9 June, 1936; Vaudreuil, 17 August, 1934; Terrebonne, 18 August, 1934; Assomption, 20 July, 1934; Berthier, 21 July, 1927.

f) Genus Coenus Dallas, 230, 1851.

Haplotype tarsalis Dallas, : delius Say.

Dallas, List of Hemip., 1, : 194, 230, 1851.

This genus, characterized by the regularly ovate form; tylus throughout more prominent than juga, which are parallel; bucculae elevated at posterior end into a distinct lobe, ending abruptly behind; side margins of pronotum straight and humeral angles rounded; scutellum broadly rounded at apex, as long as corium; apical margin of corium rounded, and lateral angle obtuse.

But one species is known in our district.

i) Coenus delius Say, 8, : 1, 320, 1831

Say, Heter, N.Harm.,:8,1831; Fitch reprint,:765, Pentatoma.

aeruginosa Amyot & Serville, Hemip.,:125,1843. Hymenarcys tarsalis Dallas, List of Hemip.,1,:23,pl.8, fig.6, 1851.

punctatissimus Vollenhoven, Versl. Med. Kon. Akad. Wetens, Ser. 11, : 183, 1868.

Oval in shape, somewhat flattened above and strongly convex below; dull yellowish above, thickly and evenly marked with fuscous punctures; narrow edges of sides of pronotum yellow.

Concerning its habits, we may say that it hibernates as an adult under sticks and dry weeds. This species breeds rather later in the year than most of our pentatomids. It feeds on timothy, clover, moth mullein, bluegrass and it is common in dry fields and pastures throughout the season.

Shefford, 1 June, 1937, 22 September, 1937; Chateauguay, 19

August, 1938; Terrebonne, 15 August, 1933; Napierville, 17 August, 1935; Labelle, 21 August, 1938; Kamouraska, 18 September, 1940; Levis, 4 August, 1931; L'Islet, 2 May, 1938; 6 September, 1939.

g) Genus Hymenarcys Amyot and Serville, 124, 1843.

Logotype perpunctata Am. & Ser. : nervosa Say.

Amyot and Serville, Hemip., : 124, 1843.

Spinola, Tavola Sinot.,:36,1850, (an emendation), Hymenarcis.

Species with strongly convex tylus, equalling the cheeks; scutellum relatively long, its apex rounded and almost reaching that of corium; frena extending just to middle of scutellum; membrane equalling or but slightly surpassing tip of abdomen.

One species occurs within our limits.

i) Hymenarcys nervosa Say, 9, : 1, 321, 1831.

Say, Heter.N.Harm.,:9,1832;Fitch reprint,:766, Pentatoma.

pennsylvaniae Westwood, Hope Cat.,1,:35, 1837, Pentatoma.

perpunctata Amyot and Serville, Hemip.,: 124, 1843.

Yellowish brown with dense black punctures; last joint of antennae fuscous; front angles of pronotum with a minute tooth; under surface yellow with black punctures, each side with a rather broad interrupted black-stripe; scutellum with a smooth space and small blackish concavity on each basal angle.

Its presence is doubtful in our district and the only one record of its occurrence is reported by Provancher in the

"Petite Faune Entomologique" (1885), Van Duzee (1912), after his visit to Quebec reports this species in the Canadian Entomologist. Torre-Bueno (1939), states that Hymenarcys nervosa is found in Quebec.

h) Genus Neottiglossa Kirby, 276, 1837.

Haplotype trilineata Kirby.

Kirby, Richardson's Fauna Bor. Am., IV, : 276, 1837.

Spinola, Essai sur les Hemip.,: 310,1837, Eysarcoris (in error).

Dohrm, Sted. Ent. Zeith., XXI, : 101, 1860. (orthotype inflexa Wolff.). Aelioides.

Fieber, Europ. Hemip.,:82, 353,1861,(logotype griseus Fieb.) Platysolen.

Small, oblong-oval species having the head equilaterally triangular in outline; juga equalling tylus or converging and nearly or quite meeting in front of it; pronotum with a median ridge only; side margins of pronotum straight, humeral angles rounded, not prominent; osteole without auricle or canal; connexivum very narrowly or not at all exposed.

Two species occur in the Province of Quebec, and they are found mostly on grasses and clover in open fields and meadows.

i)Neottiglossa undata Say, 8, : 1, 319, 1831.

Say, Heter. N. Harm.,:1831; Fitch reprint,:764, Pentatoma.

MacGillivray and Houghten, Ent. News,XIV:203, 1903, Mormidea.

americana Provancher, Fet. F. Ent.Can. 111,:38, 1835,Aelia.

Pale brown species, rather evenly marked with small black punctures, narrow smooth slightly raised median line extending from base of tylus nearly to apex of scutellum; the last two joints of antennae fuscous; third antennal three-fourths the length of second; edge of side margins of pronotum and connexivum and a short caloused line on each basal angle of scutellum, pale-yellow.

In the region of Montreal, this species is generally known and frequently taken along roadsides in low alluvial soil. Its preferencesfor feeding are on grasses, red clover, and mullein.

Montreal, 18 June, 1934; 9 September, 1936; Deux-Montagnes, 21 June, 1934; Laval, 21 August, 1938: St-Jean, 28 August, 1937; Rouville, 23 June, 1939; Shefford, 9 September, 1936; Berthier, 28 May, 1939; Joliette, 24 August, 1939; Brome, 11 September, 1936; Labelle, 29 August, 1937; Trois-Rivière, 8 June, 1938; Levis, 17 July, 1931; Quebec, 17 September, 1940; Kamouraska, 13 May, 1938.

ii) Neottiglossa trilineata Kirby, 276, 1837.
Kirby, Richardson's Fauna Bor.Am.,1V:276, 1837, Pentatoma.
Dallas. List of Hemip., 1, : 224, 1851, Aelia.

Larger than undata; head and front half of pronotum black, vertex without a pale line; median line of pronotum and a small spot behind each callosity yellow, side margins white; scutellum

with a blackish spot on apex; disk with a median yellow line extending from base to apical third; this crossed at middle of scutellum by a transverse yellowish line which unites with a sublateral line each side, extending to base of scutellum, thus forming a trident marking: dorsum black; femora and tibiae with black lines or spots.

This species is practically unknown in our district, and only a few records attest its occurrence within our limits. There is a specimen in the National Collection at Ottawa from Charlton St-James Bay, and one in the collection of the Montreal University, but from the latter there is no indication of place. This specimen was sent to M. Chagnon for identification by a young naturalist from our district and he forgot to give details.

i) Genus Cosmopepla Stal, 525, 1867.

Logotype carnifex Fabr.: bimaculata Thom.

Stal, Of. Vet. Akad. Forh., XXIC,: 525, 1867.

Black with red or yellow markings; Small and oval convex species having the head strongly deflexed, or bent downwards; cheeks equalling the tylus; membrane slightly surpassing abdomen; frena short; tibiae not sulcate.

1) Cosmopepla bimaculata (Thomas), 455, 1865.

Thomas, Trans. III: St. Agr.Soc.,V,455, 1865. Pentatoma.

Hahn, Wanz. Ins., II, : 117, 1834, Eysarcoris.

carnifex Fabricius, Ent. Syst. Suppl.,:535, 1798, Cimex.

bimaculata Coquebert, Illust.Icon.Ins.,11,:81,1801, Cimex.

lintneriana Kirkaldy, Cat. Hemip.,1,:80, 1909.

Black, shining; pronotum with a transverse line between the humeri and a narrower longitudinal median line, reddish; scutellum black with a red spot on each side near apex; frenum very short, not quite one-third length of scutellum; abdomen above narrowly edged reddish-yellow or yellow.

Very common and abundant throughtout Quebec and known as the "Black stink bug". It feeds on oats, potato, thistle, goldenrod, ragweed, buttercup, mullein, on grain and on the tips of asparagus plants.

Telenomus cosmopepla Graham parasites its eggs.

As its distribution is general throughout Quebec and it may be taken any time during the season it is not necessary to mention the distribution by counties.

j) Genus Menecles Stal, 527, 1867.

Orthotype incertus Say.

Stal, Of. Vet. Akad, Forh., XX1C, : 527, 1867.

This genus is characterized by the broad flattened form, having the head large, deeply inserted in thorax; cheeks equalling tylus; each reaching base of third ventral; bucculae sloping off at posteriorend, without an evident posterior lobe; margins of front half of pronotum strongly flattened; scutellum with long frena surpassing middle of scutellum; osteolar opening without a canal but with a prominent curved auricle; connexivum rather broadly exposed; tarsi sulcate above.

But one species is known within our limits.

i) Menecles incertus (Say), 6, : 1, 317, 1831.

Say, Heter.N.Harm.,: 6, 1831; Fitch reprint,:762, Pentatoma

Broadly oval, pale yellowish brown species with very regular and dense black punctation; antennae yellow, joints 4 and 5 piceous, paler at base; pronotum with a narrow smooth median line which extends back to middle of scutellum; mesosternum with a black median shining spot; abdomen dull yellow with a median row of rather large black spots.

Its occurrence is very doubtful in our territory though a few records report its presence within our limits. In the Ent. Record 1915 : 224, there is a record from Quebec : a specimen taken by M. Roy, and in the National Collection from Ottawa, there is also a record by Mr. Harrington and reported in "The Ottawa Naturalist" 40, : 26, 1893. Van Duzee identified a nymph taken by Mr. G. Moore from Como. However, we have no record concerning its habits.

k) Genus Thyanta Stal, 1862,

Logotype perditor Fabricius.

Stal, Rio Jan. Hemip., 11, 58, 1862.

Species of moderate size having the body ovate or subovate, usually densely rugosely punctate; head longer than wide; cheeks equalling or a very little shorter than tylus; pronotal margins simple; pronotum with a reddish-purple band between the humeri; scutellum reaching apical third of abdomen, gradually narrowing from the base; osteolar canal long and gradually tapering; tibiae feebly sulcate above.

i)• Thyanta custator Fabricius, 164, 1803.

Fabricius, Syst. Rhyng., : 164, 1803, Cimex.

Dallas, List of Hemip., 1, : 251, 1851, Pentatoma.

pallidovirens Stal, 1859, Eugenie's Resa, Ins. 227, 1859, Pentatoma pallidoventris Van Duzee, Trans. Am. Ent. Soc., XXX, 53, 1904, (lapsus cal. for pallidovirens).

Pale green to dark olive, sometimes with a purplish band across pronotum, antennae reddish brown; margins of pronotum and hemielytra, sometimes reddish yellow; a black dot behind the spiracles and a black point on incisures of ends of ventral often present; membrane surpassing the abdomen.

The occurrence of the "re-shouldered plant bug" in Quebec is reported in the literature by different sources, but I have seen only one specimen and I know that it is very rare. This species feeds on oats, corn, sorghum, asparagus, grasses, red clover, goldenrod and other Compositae, especially those growing in moist grounds. It is parasitised by : Trissolcus thyantae (Hym.), Eupelmus hirtus (Hym.), Telenomus Asmeadi and and Trissolcus podisi Ashm.

A specimen was taken in Laval county on the 12th of August 1934.

1) Genus Acrosternum Fieber, 79, 1861.

Haplotype heegeri Fieber.

Fieber, Europ, Hemip., : 79, 331, 1861.

This genus is characterized by large green species having the first antennal segment not extending beyond apex of head, and

second antennal more than half the length of fifth: cheeks not or very slightly longer than tylus; osteolar prolongation acuminate, reaching over half-way to body margin; second ventral at middle produced forward in a stout spine or well defined tubercle towards or between hind coxae.

This genus is a large one, nearly 60 species being known from various parts of the world, but only two have been taken in the Province of Quebec.

i) Acrosternum pennsylvanicum De Geer, 330, 1773.

De Geer, Memoirs, 111, : 330, pl. 34, fig. 5, 1773, Cimex viridis pennsylvanicum.

Palisot de Beauvois, Ins. Rec. Afr. Am.,:186, pl. Hemip.,11, fig., 5, 1805, Pentatoma.

Uhler, Proc. Bost. Soc. Nat.Hist.,XlV,:98,1871, Rhaphigaster.

Stal, op. cit. 10, No. 4 , : 42, 1872, Nezara.

abrupta Say, Heter. N. Harm., : 6, 1831; Fitch reprint,:761; Compl. Writ., 1, : 317, 1831, Pentatoma.

parnisus Dallas, List of Hemip.,1,:279,1851, Rhaphigaster.

Form short, oval, obtusely rounded behind;antennae green; head wider across the eyes than long: margins of abdomen concolorous with black points at the incisures; the spiracles and tips of apical angles of ventral segments black; ventral spine distinct; osteolar canal long and curved, becoming evanescent.

This species is very scarce in number within our territory. Van Duzee records it from Montreal in his catalogue and in Trans.

Am. Ent. Soc. 30, : 58, 1904. Mr Chagnon has taken one specimen at Montreal. It feeds on New Jersey tea and on small oak trees.

ii) Acrosternum hilaris Say, 5 : 1, 304, 316, 1831.
Say, Ins. of La.,:9,1832; Heter.N.Harm.,:5,1831; Fitch reprint,: 761; Compl. Writ., 1,: 304, 316, 1831.
Walker, Cat. Heter.,111,:566, 1868, Rhaphigaster.
Uhler, Proc. Bost. Soc. Nat. Hist., XIX,:380, 1878, Nezara.
sarpinus Dallas, List of Hemip.,1,:276, 1851, Rhaphigaster.
pennsylvanicum Fitch, 3rd. Rept. Trans. N.Y.St. Agr. Soc., XVI,: 389, 1855, Rhaphigaster. (cited in error).

This is an elongate-oval species having head but little wider than long; anterolateral margins of pronotum almost straight; spiracles pale brownish; hind angles of end of ventral segments black; spine of ventral segment 2 hardly attaining middle of posterior coxae; abdomen with a smooth rounded median ridge.

This bug is a general feeder and occurs on tomatoes, turnips, peas, beans, corn, and goldenrod. In summer, it is seen on tall grasses and the foliage of various herbs and shrubs along roadsides and fence rows.

Podisus maculiventris attacks Acrosternum hilaris at different stages and the nymphs and adults are often parasitised by a tachinid : Trichopoda pennipes F. Eggs are parasitised by Trissolcus euschistus Ashm., Anastatus reduvii How., Anastatus pearsali Ashm., Anastatus mirabilis Walsh., Telenomus dimmochi Ashm. and Telenomus podisi Ashm.

Montreal, 4 September, 1937; Vaudreuil, 25 August, 1938; Shefford, 6 June, 1936; Deux-Montagnes, 7 May, 1936.

m) Genus Banasa Stal, 24, 1860.

Logotype induta Stal.

Stal, Rio Jan. Hemip., : 24, 1860.

Uhler, Proc. Bost. Soc. Nat. Hist., XIC,:97, 1871, Atomosira.

(haplotype sordida Uhler).

Species of moderate size having the second antennal joint less than half the length of fifth, membrane slightly surpassing abdomen; osteolar canal forming a tapering ridge which reaches almost to outer apical angle of its supporting plate; connexivum narrowly or not at all exposed; ventral spine sometimes reduced to a broad tubercle.

About 20 species are known, mostly from the tropical regions, but two of them occur in our province.

i) Banasa dimidiata Say, 7 : 1, 318, 1831.

Say, Heter. N.Harm.,:7,1831; Fitch reprint,:763, Pentatoma.

calva Provancher, Pet. F. Ent.Can.,111,:46,1885,(c.in error).

euchlora Provancher, Pet. F. Ent. Can.,111,46,1885,(in error).

dimiata Kirkaldy, Cat. Hemip.,1,:122,1909.(mispelled name).

Oblong-oval, greenish, tinged with olive; second joint of antennae not more than half the length of third; head not narrowed anteriorly, as broad across the eyes as long; the end of each ventral with its hind angle ending in a minute spine; incisures at ends of ventral segments without a black spot.

Frequent and abundant throughout Quebec, and occurs on foliage of white and black spruces, birch, pine and mullein.

Shefford, 23 June, 1938; Rouville, 16 July, 1938; Deux-Montagnes, 10 June, 1931; Berthier, 28 June, 1938; Joliette, 20 July, 1937; Papineau, 21 September, 1937; Gatineau, 18 September, 1934; Champlain, 21 August, 1939; Laviolette, 14 July, 1939; Quebec, 10 June, 1931; Roberval, 30 August, 1939; Temiscouata, 13 August, 1939; Rimouski, 10 September, 1939; Matane, 25 September, 1940; Matapedia, 5 September, 1938; Lac St-Jean, 17 September 1940.

ii) Banasa calva (Say), 7 : 1, 318, 1831.

Say, Heter. N.Harm.,:7,1932; Fitch reprint,:763, Pentatoma.
Uhler, Proc. Bost.Soc. Nat. Hist.,XlX,:379,1878, Atomosira.
catinus (Dallas),List of Hemip.,1,:282, 1851, Rhaphigaster.
dimidiata Provancher, Pet.F.Ent.Can.,lll,:46,1885,(in error).

Similar in general to the preceding, but slightly larger and a little more narrowed from the humeri backward; antennae with joints 4 and 5 reddish, the second about three fourths the length of third; head distinctly narrowed anteriorly; incisures at ends of ventral segments with a black spot; abdomen sprinkled with reddish dots.

This species is much less common than dimidiata, and only few records indicate its occurrence in Quebec. Brother Ouellet has taken three specimens, two from Vaudreuil in July 1936 and one from Deux-Montagnes in May 1933.

C. SUBFAMILY ACANTHOSOMINAE Stal, 33, 1864.

Stal, Hemip. Afr.,1,:33, 219, 1864, Acanthosomida.

Stal, Of.Vet. Akad. Forh.,XX1C,: 532, 1867, Acanthosomina.

Lethierry and Severin, Cat. Fenl.Hemip.,1,:250,1893,Acanthosomidae.

Distant, Fauna Bre.Ind.Rhyng.,1,:313, 1902, Acanthosomatinae

Kirkaldy, Cat.Hemip.,1,:34,166, 1909, tribe Acanthosomini.

First segment of rostrum largely embedded between the bucculae, relatively slender, bucculae large, not united posteriorly; the thorax is armed with a prominent central carina or heel which extends the full length between all the coxae; abdomen also with a prominent median carina, the sharp curved apex of which extends forward between the hind coxae and overlaps that of the sternum. The tarsi are two segmented; frena extending almost to end of scutellum.

The subfamily comprises two genera in our fauna.

1) Genus Meadorus Mulsant and Rey, 315, 1866.

Logotype interstinctus H. & R. : griseus (Linn.).

Mulsant and Rey, Punaise de France, Pent.,:315, 1866.

Hahn. Wanz.Ins.,11,:70,1834,(haplotype: haemorrhoidalis Fabr.)

Clinocoris. (preoccupied name).

Fieber, Europ.Hemip.,:78, 327,1861, (in error) Sastragala.

Stal, Ann. Soc. Ent. Fr.,Ser. 4, IV,:54,(a nomina nuda)Elasmucha

Distant, Biol.Centr.Am.,Heter.,1,:100, 1881,(in error)Acanthosoma.

Lethierry and Severin, Cat. Genl Hemip.,1,: 255, 1895, gives

griseus Linn. type (cited in error), Elasmostethus.

This genus is characterized by posterior angles of pronotum angularly projecting posteriorly and the side margins ampliated; outer hind angle of sixth ventral not strongly produced backward; metasternal orifices with a short, broadly rounded canal.

One species has been found in Quebec.

i) Meadorus lateralis Say, 3,: 1, 312, 1831.
Say, Heter. N.Harm.,:3,1831; Fitch reprint,:757, Edessa.
Bergroth, Ent. News, XV11; 49, 1907, Elasmucha.
Van Duzee, Can. Ent., X1, : 109, 1909, Clinoeuris.
nebulosa (Kirby,) Richardson's Fauna Bor.Am.,1V:277, 1837;
Reprint in Can. Ent.,:138, 1872. Edessa.
nebulosa Dallas, List of Hemip.,1,: 307, 1851, Acanthosoma.
nebulosa Stal, Stet,Ent.Zeith.,XX111,:109,1862,Elasmostethus.
affinis Westwood, Hope Cat.,1,:30, 1837, Acanthosoma.
picicolor, Westwood, Hope Cat.,1,:30, 1837, Acanthosoma.

Oblong oval, greenish-yellow with coarse reddish-brown punctures, the tip of last antennal joint blackish; tylus slightly longer than the juga; rostrum slender passing posterior coxae; anterior angles of the pronotum dentate; connexivum yellow, with an oblong blackish spot on each incisure ; abdomen with a strong obtuse percurrent carina.

It is a very well known species and common in every county in the Province of Quebec. It occurs on white and black spruces, and on white birches. Its common name is "the mottled stink bug".

Berthier, 9 June, 1935; Laval, 4 September, 1940; Terrebonne, 20 July, 1939; Levis, 15 June, 1936; Trois-Rivière, 18 June, 1938; Stanstead, 3 September, 1934; Lac St-Jean, 20 June, 1936; Chicoutimi, 28 July, 1936; Roberval, 15 June, 1936.

2) Genus Elasmostethus Fieber, 78, 1861.

Logotype dentatus De Geer, : interstinctus Linn.

Fieber, Europ. Hemip.,:78, 328, 1861.
Mulsant & Rey, Punaise de France, Pent.,:524,1867, Oxydalus.
Marshall, Ent.Mo.Mag.,IV,:281, 1868, Elasmatostehus (emendation).

This genus differs from the preceeding by the posterior angles of the pronotum obtuse and the sides margins neither difussed nor ampliated, outer hind angle of sixth ventral acute, strongly produced backward; metasternal orifices with a long gradually tapering canal.

Three species are known from the United-States, two of which occur in our territory.

i) Elasmostethus cruciatus Say, 2,: 1, 311, 1831.
Say, Meter. N.Harm.,:2,1831; Fitch reprint,: 766; Compl.Writ., 1, 311, Edessa.
Uhler, Proc. Ent.Soc. Phila.,1,:23, 1861, Acanthosoma.
borealis (Westwood), Hope Cat.,1,:30, 1837, Acanthosoma.

Yellowish-brown species having the antennae pale except for the more or less darker apical segment; base of pronotum and scutellum and a broad stripe along inner margin and apex

of elytra dull red; humeral angles pale; abdomen smooth or very minutely rugose; small tubercle at the anterior angle of the pronotum.

The "red-crossed stink bug" is frequent throughout Quebec and it is usually taken on the white and black spruces, pines, aspens, birch and willows.

Shefford, 6 July, 1940; Huntingdon, 6 September, 1935; Levis, 14 May, 1938; Quebec, 20 June, 1938; 28 September, 1917; Roberval, 15 September, 1936; Lac St-Jean, 10 September, 1937.

ii) Elasmostethus atricornis Van Duzee, 75, 1904. Van Duzee, Trans. Am. Ent. Soc., XXX,: 75, 1904, Acanthosoma. cruciata Provancher, Pet. Faune Ent. Canadienne, 111,: 48, 1885, Acanthosoma.

Size and form of cruciatus; antennae piceous or black throughout; the incisures pale; humeral angles of pronotum black; cheeks with only two or three punctures and a few very fine wrinkles.

It is not so common as cruciatus and the writer has no record concerning its habits.

Montreal, 10 August, 1935; Joliette, 25 July, 1923; Deux-Montagnes, 17 July, 1935.

D. SUBFAMILY ASOPINAE Spinola, 29, 1850.

Spinola, Tavola Sinot, : 29, 30, 1850, Asopoideae.

Bergroth, Rev. Russe Ent.,1V : 32, 1904, Arminae.

Schouteden, Genera Ins. Fasc.,52,:2, 1907, Amyoteinae.

Kirkaldy, Cat. Hemip., : 3, 1909, Cimicinae.

Dallas, List of Hemip.,1,:75, 1851, as family, Asopidae.

Stal, Hemip. Afr.,1, : 32, 63, 1864, Asopida.

Puton, Cat.Hemip.,Palae.Edn.,3,:14,1886, as tribe Asopini.

Bucculae very short, convergent and united behind; segment 1 of rostrum stout, free, directed away from the head, only its base lying between the bucculae, insertion of rostrum close to end of tylus, front tibiae with a short spine near middle of inner side; tarsi three-jointed; the subfamily is represented in the United States and Canada by 11 genera and about 30 species. Of these , four genera and 11 species are known from our territory.

These insects ar of considerable economic value because they are predatory upon plant lice, caterpillars and other soft bodied injurious insects.

1) Genus Perillus Stal, 88, 1862.

Logotype confluens Herrich-Schaeffer.

Stal, Stet.Ent.Zeit.,XXlll,:88,1862,(subgenus of Oplumus).

Perrilloides Schouteden, Genera Ins.,Fasc.52:11,36, 1907.

Medium sized oval species having the anterior lateral margins of the pronotum with a distinct carina; scutellum

much narrower, its tip at most scarcely wider than corium, frena one-half or more its length, apex of corium oblique; membrane passing the tip of abdomen; front femora armed with a subapical spine or tooth of variable size; tibiae with a distinct groove or sulcous below; ventral spine short, obtuse, scarcely reaching hind coxae.

Six species are known, all from Mexico and the United States, but four of these species occur in our territory.

i) Perillus bioculatus Fabricius, 715, 1775.

Fabricius, Syst. Ent.,: 715, 1775, Cimex.

Gillette and Baker, Hemip. Colo.,: 12, 1895, Mineus.

Schouteden, Genera Ins., Fasc.52,:37, 1907, Perilloides.

Black with red markings; elytra black, the basal half of costal border red; antennae black; lower margin of pronotum red; only basal joint and incisures pale; margin of ventral segment Vl quite distinctly produced in a more or less obvious angle; abdominal segments with a row of black spots, in female with two submedian rows of small spots, a round spot in each spiracle, a stripe along the middle of each side, and the genital plate, black; in male with a large central black spot embracing the pubescent areas.

ii) Perillus bioculatus clanda Say, 312; 11, 240, 1825.

Say, Jl.Akad.Nat.Sci.Phil.,lV,:312,1825;Compl.Writ.,11, 240, 1885 Pentatoma.

claudus Uhler, Bul.U.S.Geol.Surv.,1,:381,1876; (an emendation).

It differs from typical bioculatus by its colour, the black of that form being replaced by brown or piceous, and the red or orange by ivory-white or yellow; corium pale, only the narrow inner margin of the elytra ivory-white and a median triangular spot black.

It is the most important predaceous enemy of the Colorado potato beetle. Young bugs feed on the eggs of the potato beetle and later attack the immature stage. For the last 20 years this bug has kept Leptinotarsa dicemlineata in check in Michigan; the arsenical sprays used to control the beetle do not destroy the bug. That is the reason why it is called "the potato-beetle destroyer".

Preyed on by Cnemidophorus, Chynosoma, Sceloporus.

It is very common and abundant in our district.

Stanstead, 6 September, 1932; Shefford, 8 August, 1938; Montreal, 16 August, 1938.

iii) Perillus circumcinctus Stal, 89, 1862.

Stal, Stet. Ent. Zeit., XXlll, : 89, 1862.
Schouteden, Genera Ins. Fasc.52,: 37, 1907, Perilloides.
marginatus Provancher, Nat.Can.,lV,:74, 1872, Perilloides.

A pale chacolate-brown species with antennae black, first two joints and basal half of lll reddish yellow; pronotum with anterior and lateral margins, and median stripe, ivory-white or pale yellow, scutellum entirely surrounded by a broad ivory-

white marginal stripe; anterior femora with a cylindrical blunt spine.

It feeds on larvae of the potato beetle and on various other beetles. Van Duzee found it in coarse weeds, shrubs and trees in July and August. It hibernates under dead leaves and grasses. Hart in Illinois says: "it seems to occur only in sandy areas".

Quebec, 15 July, 1937; Shefford, 10 June, 1937; Lac St-Jean, 26 May, 1939; Roberval, 29 May, 1939; Temiscouata, 27 July, 1936; Levis, 20 July 1931; Assomption, 17 July, 1939; Joliette, 12 July, 1936; Montreal, 18 June, 1935.

iv) Perillus exaptus Say, 213; 11, 240, 1825.

Say, Jl. Akad.Nat.Sci.Phila.,lV,:313,1825;Compl.Writ.11, : 240 1831, Pentatoma.

Uhler, Proc. Ent. Soc. Phila.,1,: 23, 1861, Zicrona.

Schouteden, Genera Ins.,Fasc.52,:38,pl.3,1907, Perilloides.

variegata (Kirby), Richardson's Fauna Bor.Am.10:267,1837 Pentatoma.

marginella (Dallas),List of Hemip.,1,:109, 1851, Zicrona.

Colour extremely variable, entirely black to pale yellowish or red with black markings; pronotum pale red with a median black bar on front portion; scutellum black with a broad yellow margin except at base; anterior femora with a low conical tubercle.

It is very scarce in the district of Montreal but it appears to be more common in the district of Lac St-Jean.

There is nothing known about its habits.

Lac St-Jean, 27 July, 1936; Vaudreuil, 15 June, 1937; Berthier. 25 May, 1937; Labelle, 20 June, 1933; Roberval, 2 June, 1937; Rouville, 19 May, 1938; Joliette, 4 June, 1936.

2) Genus Apateticus Dallas, 105, 1851.

Haplotype Halys Dallas,: lineolatus Herrich-Schaeffer.

Dallas, List of Hemip.,1,:105, 1851.

Distant, Fauna Br. Ind.,Rhync.,1,:153, 1902, Podisus.

Rather large elongate species having the tylus generally shorter than juga, apex of head thus emarginate; beak not passing hind coxae; its second joint less than one-half longer than third; humeral projection, if present, acute or spinose; second ventral with a distinct slender median spine projecting forward to or between the hind coxae; front femora unarmed; osteolar canal long and slightly curved forward;

i) Apateticus cynicus Say, 3 : 1, 312, 1831.

Say, Heter. N. Harm.,: 3, 1831; Fitch reprint : 757; Compl. Writ.,1, : 312, Pentatoma.

Uhler, Proc. Bost. Soc. Nat. Hist.,XIX,:370, 1878, Podisus.

grandis Dallas, List of Hemip., 1, : 96, 1851, Arma.

grandis Stal, Of.Vet. Akad. Forh., XXIC,:497, 1867, Podisus.

grandis Kirkaldy, Cat. Hemip.,1,22, 1909, Apoecilus.

Pale brown species with anterior lateral margins of pronotum very finely serrulate; connexivum with a greenish black bar across the ends of each segment . the middle orange-red.

Scarce throughout Quebec, it feeds on sap of shrubs and trees along the margins of open woods and cultivated fields. It is taken in swampy meadowsfrom grasses. It preys on Leptinotarsa dicemlineata and on Cirphis unipunctata.

Montreal, 26 August, 1937; Joliette, 15 September, 1938; Levis, 3 September, 1935; Tadoussac, 30 August, 1930.

ii) Apateticus bracteatus Fitch, 336, 1856.

Fitch, 3rd. Rept.,Trans.N.Y.St.Agr.Soc.,XVl,:336, 1856, Arma.
Gillette and Baker, Hemip., Colo.,:12, 1895, Podisus.
Kirkaldy, Cat. Hemip.,1,: 22, 1909, Apoecilus.

Generally darker in colour than cynicus and distinguished by a less acute pronotal spine ; cheeks edged with a narrow green line; front half of pronotum with six small green dots, four in a transverse row, the other two behind the end ones of the row; connexivum orange with a dark green oblong spot each side of each incisure.

More common than the preceeding. We take it from grasses. It is predaceous on the larvae of the argus Tortoise and on the beetle : Chelymorpha cassidae.

Montreal, 25 August, 1937; Shefford, 21 September, 1937; Quebec, 15 September, 1938.

3) Genus Podisus Herrich-Schaeffer, 296, 1853.

Logotype vittipennis Herrich-Schaeffer,: bifidus Lap.
Herrich-Schaeffer, Wanz. Ins., IX. : 296, 337, 1853.

Stal, Rio Jan. Hemip., 1, 1860, Telepta.
Schouteden, Genera Ins. Fasc. 52, : 70, 71, 1907, Eupodisus.

This genus differs from Apateticus, mainly in their smaller size, by the longer tylus, which equals or exceeds the juga; rather prominent and acute lateral angles of the sixth abdominal segment; absence of stridulatory areas of the male.

Four species occur in the Province of Quebec.

i) Podisus maculiventris Say, 11 ; 1831.
Say, Ins.Of.La.,:11,1831,Pentatoma;Reprint in Psyche,V111,1899.
Zimmer, Univ. Neb.Studies, X1,:237,1912, Apateticus.
spinosa Dallas, List of Hemip.,1,:98, 1851, Arma.
spinosa Stal,Of.Vet.Akad.Forh.,XX1C,: 497, 1867,Podisus.
pallens (Stal), Areg.Eugen.Resa.Ins.,:222, 1859, Arma.
pallens Stal, Of.Vet.Akad.Forh.,XX1C,:497, 1867, Podisus.
pallens Schouteden, Genera Ins.Fasc. 52,:72, 1907, Apateticus.

Brown, elongate oval species, varying irregularly in shade from light to dark, generally with a grayish, not reddish tinge; humeri produced in slender outward projecting spines; membrane with a dark longitudinal stripe; ventral spine reaching middle of hind coxa, its apex rounded; hind femora with two blackish dots at apical third.

It is frequent throughout Quebec. The "spined soldier bug" feeds on foliage of shrubs but usually it preys on many coleopterous and lepidopterous larvae. It attacks Acrosternum hilaris and Leptinotarsa dicemlineata at all stages, and the larvae

of Heliothis obsoleta (Ly.), the nymphs of Euschistus tristigmus, the eggs of plant lice bug. It is predaceous on the rusty tussock moth, Hyphantria cunea and on Diprion polytomus, and on Euschistus variolarius. Nymphs are predaceous on the larvae of the birch leaf-mining sawfly, on Papaipema nebris, on the potato tuber moth and on the fall army worm. It is parasitised by Trissolcus podisi (hym.) and Trissolcus thyantae.

Sherbrooke, 12 August, 1932; Rouville, 9 September, 1936; Shefford, 20 September, 1938; Deux-Montagnes, 18 August, 1932; Quebec, 17 August, 1938; Kamouraska, 16 August, 1940;

ii) Podisus serieventris Uhler, 94, 1871.

Uhler, Proc. Boston Soc. Nat. Hist.,X10,:94,1871:X1X,:370,1878. Schouteden, Genera. Ins.,Fasc.52.: 72, 1907. Apateticus.

Pale brown, oblong-oval species with antennae reddish-brown, the third and fourth joints in great part fuscous, humeri blackish; thoracic pleura with the punctures coarser and usually aggregated to form an irregular dark median stripe; femora thickly flecked with purplish dots; abdomen with five rows of black spots, the median row grading posteriorly; ventral spine short, not reaching hind coxae.

This species occurs throughout Quebec, but it is scarce in number. In Quebec, it is taken on the white and black spruces. It is the natural enemy of Adalia bipunctata. L. It preys on noctuid larvae Clisiocampa disstria, Hyphantria cunea (Drury) Vanessa antiopa, on Podisus species, Menecles incertus and

all stages of Porthetria dispar.

Bonaventure, 24 August, 1939; Saguenay, 29 July, 1937; Gatineau, 20 July, 1927; Matapedia, 28 August, 1931; Rimouski, 2 September, 1938; Abitibi, 20 August, 1933.

iii) Podisus modestus Dallas, 101, 1851

Dallas, List of Hemip.,1,: 101, 1851, Arma.

Schouteden, Genera Ins., Fasc. 52,: 72, 1907, Apateticus.

aggressor Walker, Cat. Heter.,11,: 359, 1867, Rhaphigaster.

Pale reddish brown and smaller than maculiventris; antennae reddish-yellow, the tips of joints 4-5 often piceous; pronotum with humeri triangular, subacute; ventral spine short; abdomen with a row of small dots each side, a median row of small spots also sometimes present; femora without purplish dots; membrane with a dark blotch at apex.

This bug is frequent throughout Quebec and especially on trees: black and white spruces, cedar, birch, aspens, firs and larch. It is taken by sweeping low herbage in woods. The "modest soldier bug" as we call it, preys on tent caterpillar, on the cutworms and on the fall canker worm. In Quebec, it is predaceous on the larvae of the Larch sawfly. It is parasitised by Telenomus podisus.

Montreal, 5 July, 1938; Shefford, 22 July, 1940; Joliette, 2 September, 1939; Laviolette, 14 September, 1940; Levis, 20 July, 1936; Quebec, 29 May, 1938; Lotbinière, 12 September, 1939;

Saguenay, 3 September, 1937; Roberval, 10 July, 1936; Lac St-Jean, 21 July, 1939; Montmagny, 27 June, 1939; Kamouraska, 9 May, 1934; Rimouski, 15 August, 1940; Matapedia, 26 June, 1939; Gaspé Nord, 3 September, 1940.

iv) Podisus placidus Uhler, 203, 1870.

Uhler, Am. Ent., 11, : 203, 1870.

Smith, Cat. Ins. N.J., Edn., 3, : 138, 1910, Apateticus.

Pale yellow species with edge of cheeks blackish; pronotum with side margins straight, finely crenate before the middle; humeri obtusely rounded; membrane without dark stripes; connexivum spotted; abdomen often with a tow of small spots on each side, the angles of ends of ventral each with a blackish joint; ventral spine long, extending between hind coxae.

Podisus placidus preys on the tent caterpillar and the white-marked tussock moth. Nymphs attack the larvae of currant sawfly, Pteronus ribesii (Scap.) Walsh. The young nymphs feed on juices of leaves until the last molt takes place, and from this time on they are predaceous.

Assomption, 13 July, 1935; Vaudreuil, 10 August, 1937; Shefford, 24 June, 1937; Joliette, 2 July, 1936; Berthier, 7 August, 1934; Deux-Montagnes, 4 September, 1936; Labelle, 17 July, 1933;

4) Genus Zicrona Amyot and Serville, 86, 1843.

Haplotype caerulea (Linn.).

Amyot and Serville, Hemip., :86, 1843.

Cheeks convex, equalling tylus; beak short, its second

joint one- half longer than third, the latter equal to fourth; head shorter than pronotum, scarcely as long as wide; antero-lateral margins of pronotum entire, smooth; humeri not prominent; venter without a basal spine or prominent tubercle; osteolar canal very narrow, curved, lying close to the front edge of the metasternal plate; front femora and second ventral unarmed.

A single species is known in Canada, and the United-States.

i) Zicrona caerulea (Linn.), 445, 1758.

Linnaeus, Syst. Nat., Edn. 10, 1, : 445, 1758, Cimex.
Tigny, Hist. Nat. Ins. Edn.2,1V,:299, 1813, Pentatoma.
Burmeister, Handb. d. Ent.,11,: 378, 1835, Aesopus.
Blanchard, Hist. des Ins.,Hemip,,:154, 1840, Stiretus.
Herrich-Schaeffer, Wanz. Ins., Verg.,:17, 1853, Arma.
concinna (Westwood), Hope Cat.,1,:39, 1837, Pentatoma.
violacea (Westwood), Hope Cat.,1,:39, 1837, Pentatoma.
illustris Amyot and Serville, Hemip., : 87, 1843.
cuprea Dallas, List of Hemip., 1, : 108, 1851

Oblong-oval, dark purplish blue or metallic green, rostral segment 2 one-half longer than 3 ; anterolateral margins of pronotum obtuse; humeri not prominent; osteolar canal lying close to anterior margin of metasternal plate.

This species is very rare in Quebec and its occurrence in Quebec is proved by only one specimen taken from Gaspe and recorded at Ottawa. This bug is supposed to be predaceous.

VII. SUMMARY.

1. The pentatomids of the Province of Quebec are represented in our fauna by four different subfamilies, twenty genera and thirty-nine species.

2. With the exception of the Asopinae, the pentatomids occurring in our region are mostly phytophagous insects, but few of them are numerous enough at any one time and place to do much damage to the vegetation.

3. In our Province, there is only one generation for most species, the adults overwintering.

4. The form of the body presented by the great majority of the members of this family is broad, short and only slightly convex; the head and prothorax form a triangle. The scutellum is usually narrowed behind; it is large and in few forms nearly covers the abdomen. The tibiae are unarmed or are furnished with very fine short spines.

5. The characters and structures used in the keys are only those which are plainly visible, accessible and clean cut. The arrangement of the genera and the species follows closely Van Duzee's 1917 Catalogue. Nomenclature also adheres to this Catalogue.

6. The genus Podops is included in the family Pentatomidae on account of its form and habits.

7. The subfamily Pentatominae contains the majority of our stink bugs. The species Peribalus limbolarius Stal., Mormidea lugens Fabricius, Euschistus euschistoides Voll. and Cosmopepla bimaculata Thomas, are very common while the species Brochymena arborea Say, Neottiglossa trilineata Kirby, Thyanta custator Fabricius, Acrosternum pennsylvanicum DeGeer, Banasa calva Say, are very scarce. Sciocoris micropthalmus Flor., Hymenarcys nervosa Say, Menecles incertus Say, are doubtful, though their occurrence is reported in the literature.

8. The members of the subfamily Asopinae are of considerable economic value because they are predatory upon plant lice, caterpillars and other soft bodied injurious insects. Perillus bioculatus clanda Say, for instance, is the most important predaceous ennemies of the Colorado potato beetle.

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IX. GLOSSARY.

For ready references, these structures are listed alphabetically, rather than in the natural sequence. The majority of definitions were taken in "A Glossary of Entomology" prepared by J.B. Smith and published by the Brooklyn Entomological Society,

Abdominal groove: a linear median longitudinal channel on the venter, in which the rostrum lies.

Ampliated: moderately dilated.

Arcuate: curved like a bow.

Arolia: cushion-like pads on tarsi, between the claws; sometimes reduced to bristles.

Auricles: an appendage resembling a little ear.

Beak: the jointed structure covering the lancets.

Blotch: a large irregular spot.

Bucculae: a pair of sclerites on the front of the gula and each side of the base of beak.

Callus: a thick swollen lump on the hard outer parts of the body; a somewhat flattened elevation.

Cheeks: the genae; the lateral parts of the parietals, generally the areas behind and beneath the eyes.

Clavus: a narrow part lying next to the scutellum and separated from the corium by the claval suture.

Claws: hook-like structures at the end of the tarsus.

Commissure: the joint of meeting or union of two bodies.

Connexivum: the prominent, more or less flattened margin of abdomen, at the puncture of the dorsal and ventral plates.

Corium: larger outer portion of the hemelytra.

Crenate: Scalloped, with rounded teeth.

Crenulate: with smallscallops, evenly rounded and rather deeply curved.

Declivent: sloping gradually downward.

Deflexed: bent downward.

Depressed: flattened down vertically; opposed to compressed.

Disk: the central upper surface of any part; all the area within a margin.

Emarginate: notched; with an obtuse, rounded or quadrate section cut from a margin.

Embolium: the narrow area along the outer margin of the hehelytra.

Explanate: spread out and flattened; applied to a margin.

Frenum: the lateral groove in the under side of the margin of the scutellum into which fits or catches the channeled locking divice on the upper exge of the clavus.

Genae: see cheeks.

Hemelytra: a modification of the anterior wings of Heteroptera, coriaceous at base, membranous at tip, not meeting in a straight line at the middle.

Humeral angles: the angles where the lateral margins of the disk meet the hind margin of the pronotum.

Incisure: an impressed line marking the junction of two segments; an incision.

Juga: the anterior lobes of the head of the Heteroptera; each side of the tylus.

Mucro: a straight or curved stout, pointed process.

Membrane: the thin membranous tip of the hemelytra.

Ostiole: one of the lateral openings of the scent gland in adults, on the metasternum near the coxae; in the nymph these openings are paired and dorsal on the abdomen.

Ostiole canal: a marginal furrow, groove or channel leading from the ostiole.

Piceous: pitchy black.

Porrect: stretched out foreward; straight prominent.

Rostrum: the jointed beak covering the piercing lancets.

Scutellum: the triangular piece between base of hemelytra.

Sinuate: applied to lines and margins with an in and an out curve.

Sulcate: grooved; furrowed with broad, concave parallel impressed lines.

Tooth: an acute angulation; a sharp pointed process from an appendage or margin.

Tubercle: a little solid pimple or small chitinous button.

Tylus: the anterior central lobe of the head in Heteroptera. bounded laterally by the juga, from which it is separated by lateral suture.

Vertex: the top of the head between the eyes front and occiput.

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PLATE 1

Half dorsal and ventral view of Euschistus euschistoides Voll. illustrating the external parts used in description of a pentatomid.

PL.I

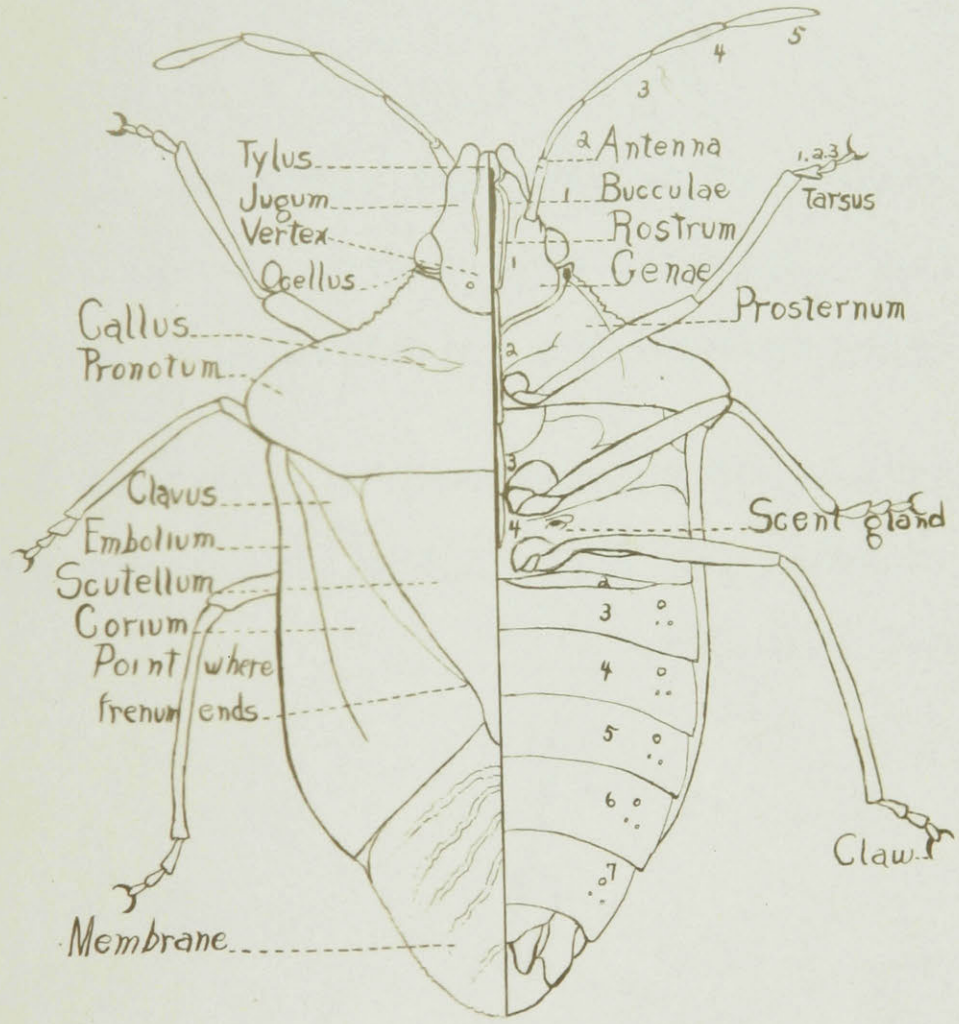

Tylus
Jugum
Vertex
Ocellus
Callus
Pronotum
Clavus
Embolium
Scutellum
Corium
Point where frenum ends
Membrane
Antenna
Bucculae
Rostrum
Genae
Prosternum
Tarsus
Scent gland
Claw
1
2
3
4
5
6
7

PLATE 11

Fig. 1 : Rostrum of an Asopinae : segment 1 of rostrum stout free, directed always from the head, only its base lying between the bucculae.

Fig. 2 : Rostrum of a Pentatominae : segment 1 of rostrum slender, not free, lying within the groove between the bucculae.

PL.2

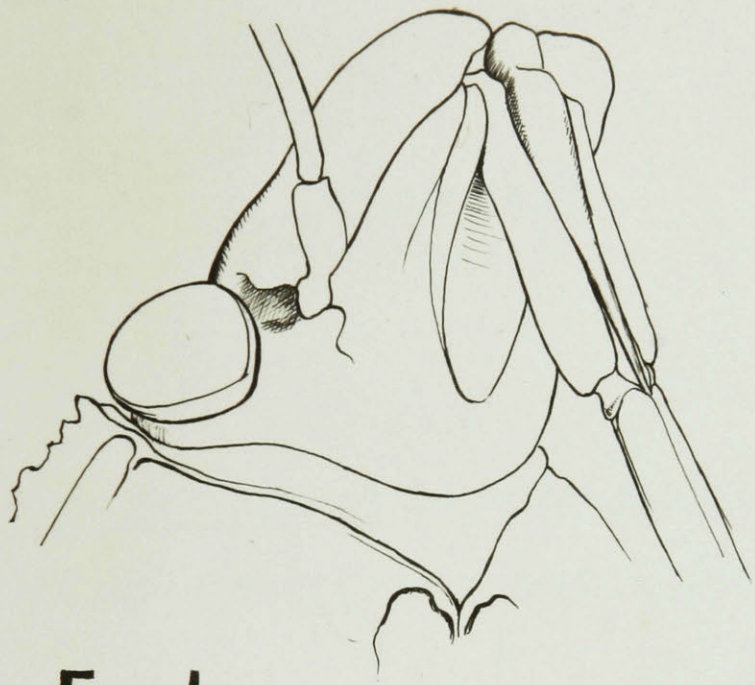


Fig.1

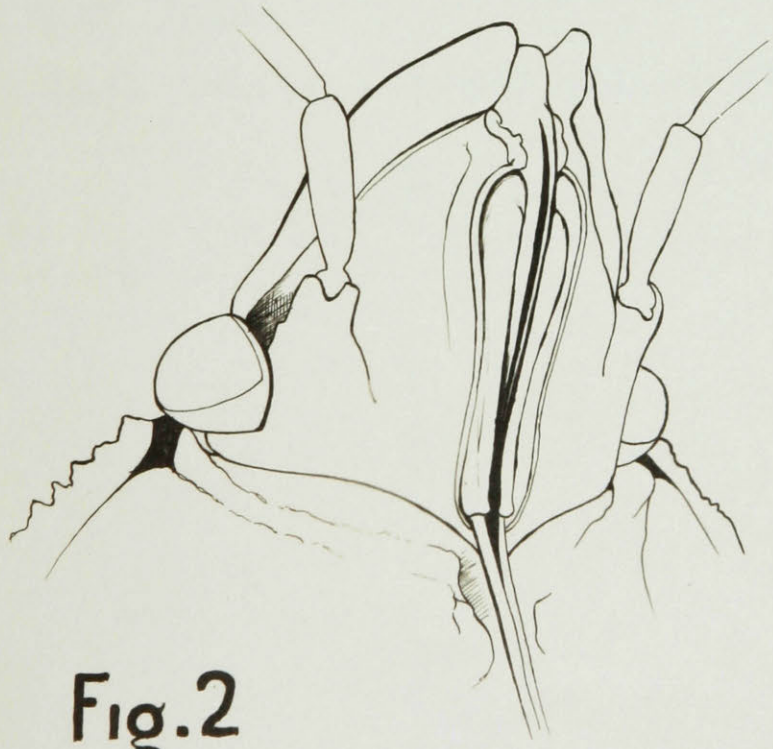


Fig.2

PLATE 111

Fig. 1 : Head and pronotum of Brochymena quadripustulata Fabr. juga longer than tylus; pronotum with humeri obtusely triangular.

Fig. 2 : Head and pronotum of Brochymena arborea Say : juga equal to tylus, humeral projections of pronotum subquadrate.

PL.3

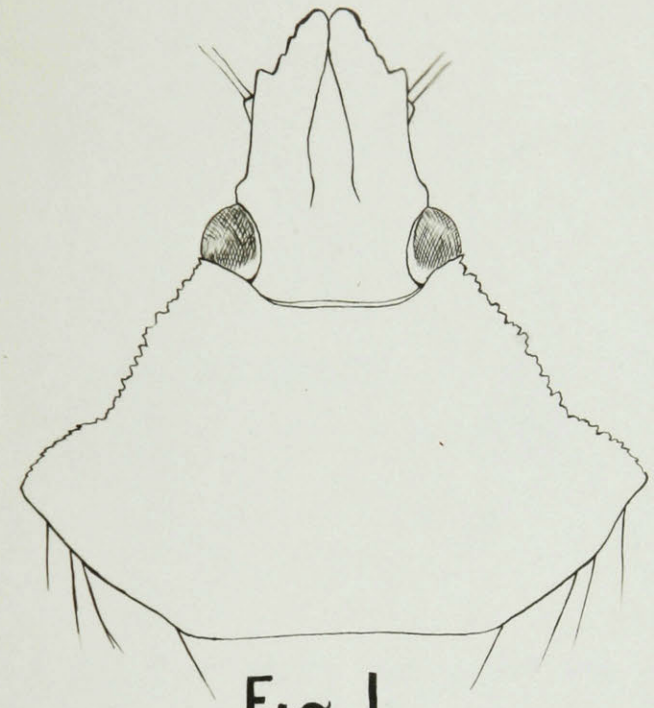


Fig. 1

Fig. 2

PLATE 1V

Fig. 1 : Tylus as long as juga : Podisus aerieventris Uhler.

Fig. 2 : Tylus slightly shorter than juga : Apateticus cynicus Say.

PL. 4

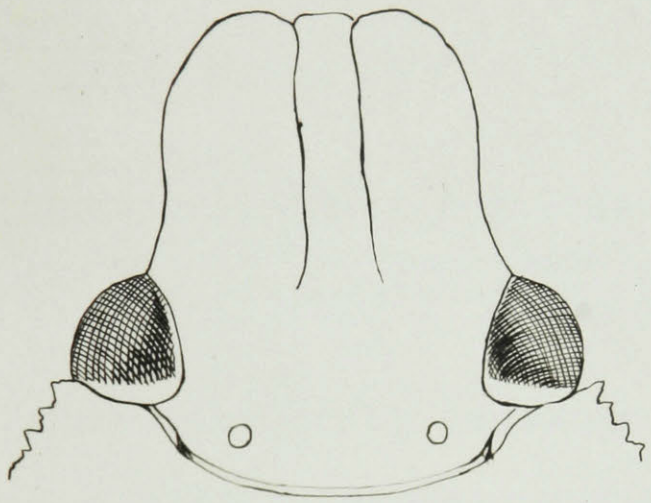


Fig. 1

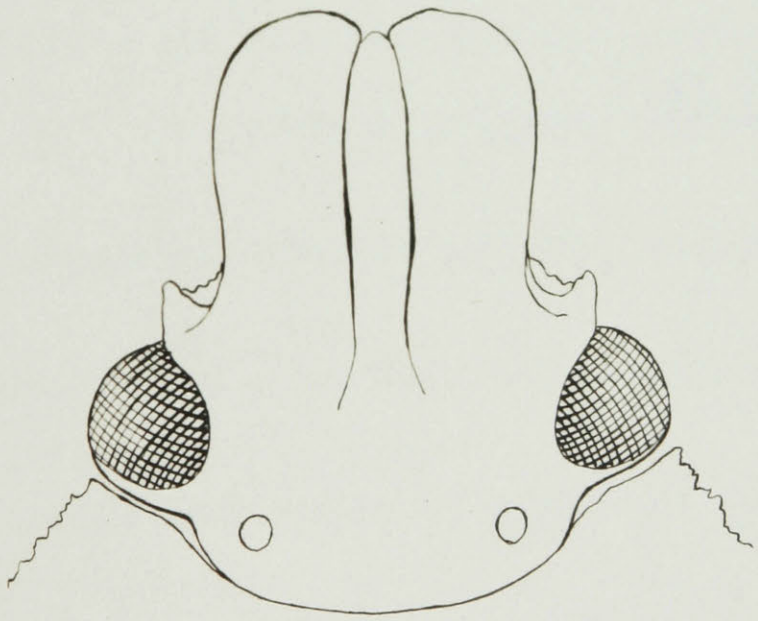


Fig. 2

PLATE V

Fig. 1 : Second antennal joint less than half the length of fifth : Banasa dimidiata Say.

Fig. 2 : Second antennal joint more than half the length of fifth : Acrosternum hilaris Say.

Fig. 3 : Osteolar opening usually with a short curved auricle having a rounded tip but not extended as a canal.

Fig. 4 : Osteolar opening without an auricle but extended as a narrow tapering canal.

Fig. 5 : Osteolar opening without an auricle or a canal.

Fig. 6 : Tarsi three-jointed of a Pentatominae.

Fig. 7 : Tarsi two-jointed of an Acanthosominae.

PL. 5

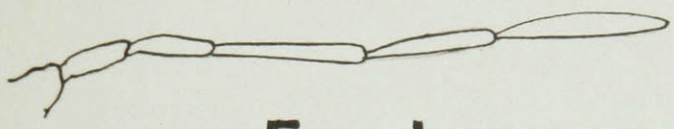


Fig. 1

Fig. 2

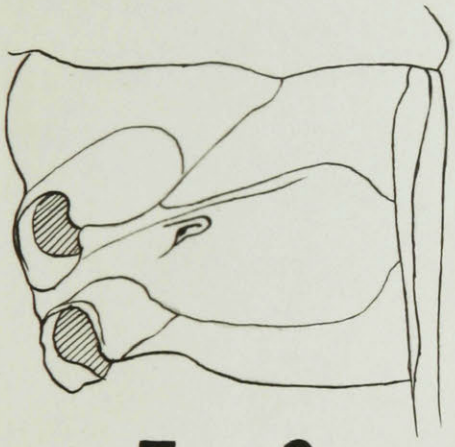


Fig. 3

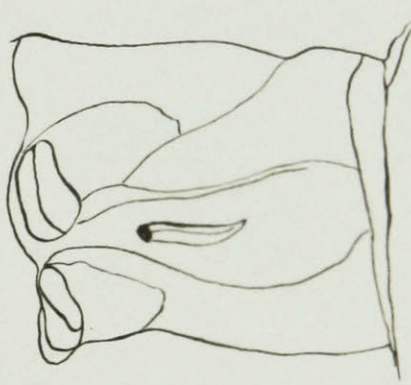


Fig. 4

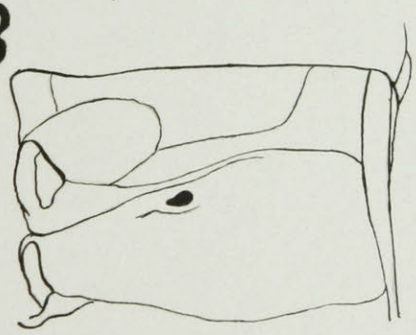


Fig. 5

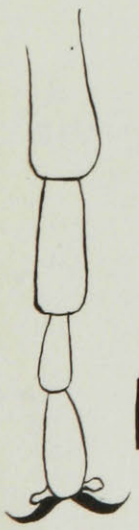


Fig. 6

Fig. 7

PLATE V1

Fig. 1 : Pronotum with a pale line connecting lateral angles.

Fig. 2 : Transverse dark bar of pronotum interrupted forming two spots.

Fig. 3 : Transverse bar of front half of pronotum entire.

Fig. 4 : Pronotal angles acute.

Fig. 5 : Pronotal angles rounded.

Fig. 6 : Pronotal angles long and the interior lateral margins finely serrulate.

Fig. 7 : Pronotal angles short and the interior lateral margins more distinctly serrulate.

PL. 6

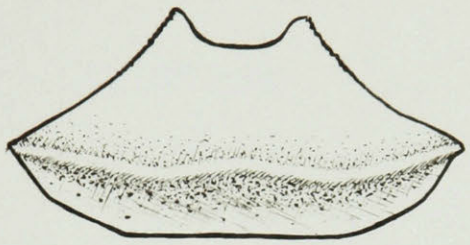


Fig. 1

Fig. 2

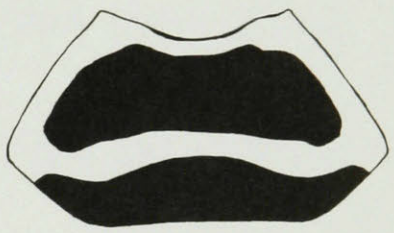
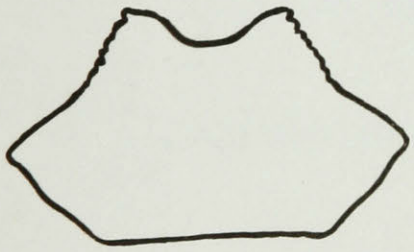


Fig. 3



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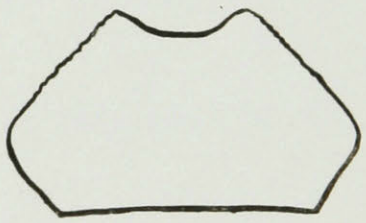


Fig. 5

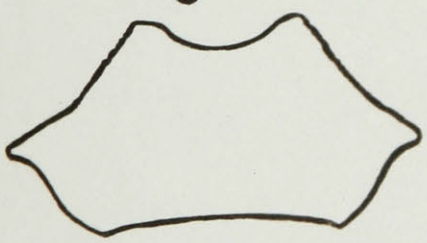


Fig. 6

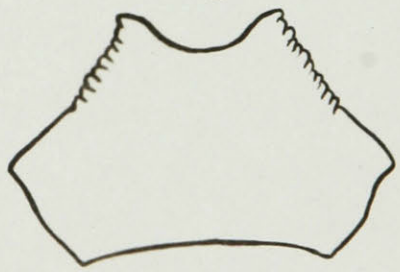


Fig 7

PLATE V11

Fig. 1 : A V-shaped scutellum.

Fig. 2 : A U-shaped scutellum.

Fig. 3 : A scutellum gradually tapering.

Fig. 4 : A scutellum rapidly tapering.

Fig. 5 : A scutellum shorter than corium.

Fig. 6 : A scutellum equal to corium.

PL. 7

Fig. 1

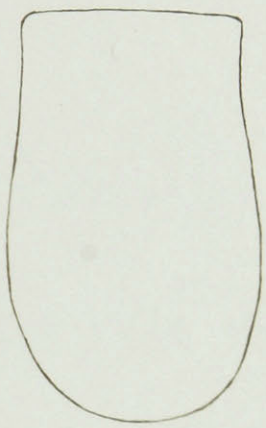


Fig. 2

Fig. 3

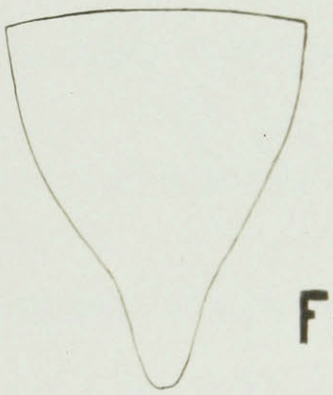


Fig. 4

Fig. 5

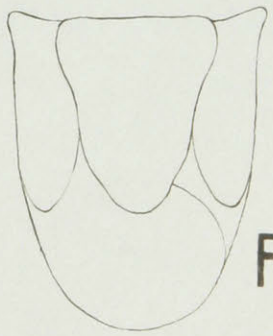


Fig. 6

PLATE V111

Fig. 1 : Sternum with a ridge or a carina.

Fig. 2 : Venter with a tubercle.

Fig. 3 : The sixth ventral segment of the abdomen strongly produced backward.

Fig. 4 : Abdomen with a short ventral spine.

Fig. 5 : The sixth ventral segment of the abdomen not strongly produced backward.

Fig. 6 : A ventral spine reaching middle of hind coxae.

PL. 8

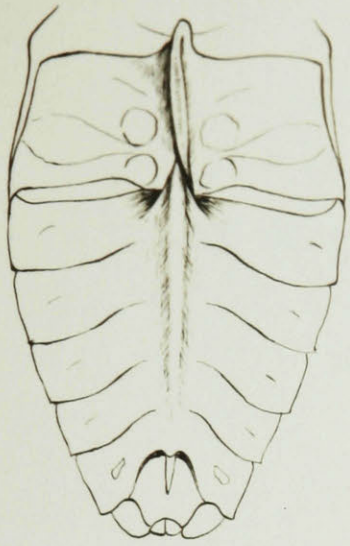
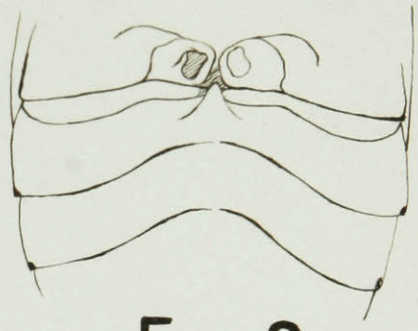


Fig. 1



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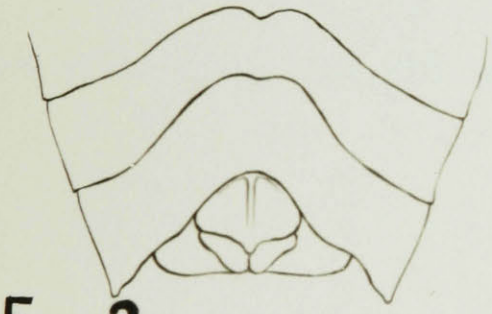
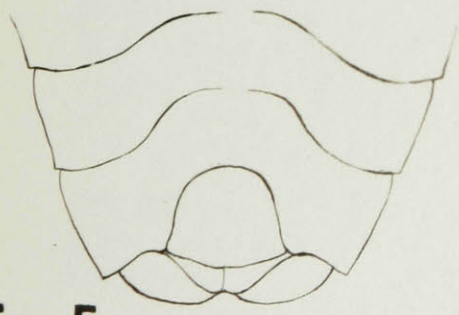


Fig. 3

Fig. 4



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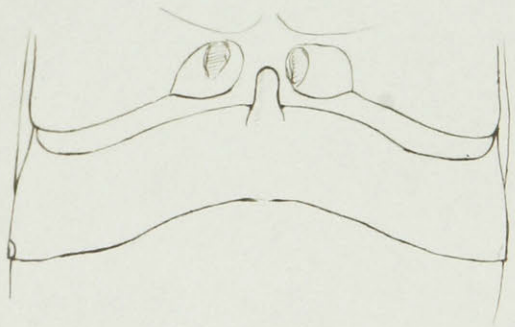


Fig. 6

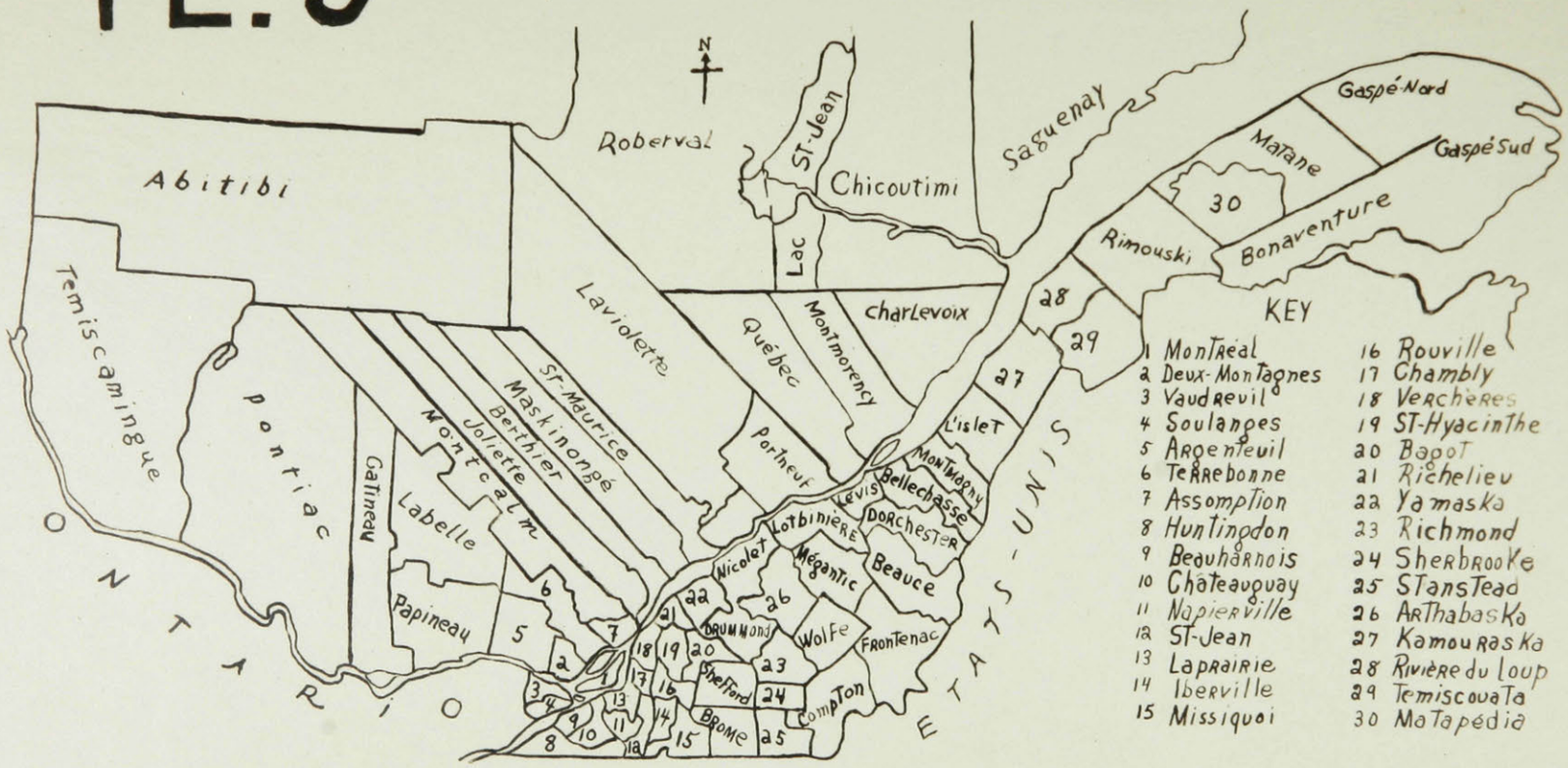
PLATE 1X

Map showing the distribution of the counties in the Province of Quebec.

PL. 9

PROVINCE of QUEBEC

Map Showing Counties



KEY

1	Montréal	16	Rouville
2	Deux-Montagnes	17	Chambly
3	Vaudreuil	18	Verchères
4	Soulanges	19	St-Hyacinthe
5	Argenteuil	20	Bagot
6	Terrebonne	21	Richelieu
7	Assomption	22	Yamaska
8	Huntingdon	23	Richmond
9	Beauharnois	24	Sherbrooke
10	Châteauguay	25	Stanstead
11	Napierville	26	Arthabaska
12	St-Jean	27	Kamouraska
13	Laprairie	28	Rivière du Loup
14	Iberville	29	Témiscouata
15	Missisquoi	30	Matapédia