

On the genera of CARABIDÆ with special reference to the fauna of Boreal America.

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Before entering the subject of the present essay it will be useful to consider some preliminary matters about which there is still some discussion and differences of opinion.

The Carabidæ forms one of the members of the Adephagous series of coleoptera which is readily recognized by the predaceous character of its mouth parts, its slender antennæ (except in Gyrinidæ), pentamerous tarsi and the structure of the first abdominal segment which is in all cases divided or hidden by the posterior coxæ in such a manner, that it is entirely lateral, rarely appearing as a small triangular piece between the posterior coxæ.

The ventral character is an important one and it prevails without exception in the entire series. If we examine the Gyrinidæ, however, which the books all agree in saying have six ventral segments, the first segment will be found apparently very long and passing entirely across the abdomen without interruption by the coxæ. A more careful examination will show that this segment is really composed of two closely united, but with traces of the suture visible near the coxæ as I have illustrated on Pl. III, fig. 9. The Gyrinidæ therefore have seven ventral segments.

With an apparent exception thus disposed of the limits of the families of the Adephaga are to be considered and here is the point where the greatest diversity of opinion prevails, especially with reference to the Haliplidæ and the two aberrant genera *Amphizoa* and *Pelobius*.

The Haliplidæ are placed by Lacordaire in the Dytiscidæ rather under protest, while subsequent authors have removed them in a more or less decided manner either as a separate family or sub-family. In a preliminary sketch of a new classification of Dytiscidæ, (Comptes-rendus de la Soc. Ent. Belg. Sept. 4, 1880), Dr. Sharp says: "I exclude the Haliplides from the family and leave for the Carabophiles to decide whether they should be considered Carabidæ or form a distinct family." They should form a separate family; my reasons will be given hereafter.

Amphizoa immediately concerns our fauna. It was originally described as typical of a distinct family by Dr. LeConte, (Proc. Acad. 1853, p. 227—8), and notwithstanding the opposition of Schaum the

same view is maintained in the Classification of the Coleoptera of North America. Chaudoir (Bull. Mosc. 1872), says: "notwithstanding the opposition of many entomologists, this genus can be placed only in the vicinity of *Trachypachys*, as a distinct group."

Dr. Sharp in the paper above cited claims for *Amphizoa* a place in the Dytiscidæ in the series *Dytisci complicati*, which have the metasternal episternum taking part in the closure of the middle coxæ. This character which I first observed in *Amphizoa* and illustrated by a figure, (Trans. Am. Ent. Soc. 1867, p. 157), appears to have caused Dr. Sharp to arrive at the above conclusion. I believe *Amphizoa* to be far less a Dytiscide than a Carabide.

The series in which Dr. Sharp places *Pelobius* is called *Dytisci fragmentati* which is characterized by the less complex structure of the outer side of the middle coxal cavities. Here the same number of pieces are found which we observe in the sub-family Carabinæ, that is, the mesosternum, its epimeron and the metasternum. These two series of Dytiscidæ Dr. Sharp very aptly compares with a similar division of the Carabidæ in two series, in which the *D. fragmentati* represent the more highly specialized Carabinæ and the *D. complicati* the Harpalinæ. In *Amphizoa* and *Pelobius* I see two distinct types each with a very evident Carabide relationship and intermediate between the Carabinæ and Dytiscidæ in two distinct lines. The Carabinæ seem to be a centre from which the other Carabidæ and the Dytiscidæ diverge, the former toward a simpler the latter to a greater degree of complication of the coxal structure.

Pelobius was accepted by Lacordaire and many since as an undoubted Dytiscide with certain aberrant characters. Dr. Sharp, while admitting that it has but little claim to such a position, places it at the head of that family notwithstanding that he says, "the Carabide predominates over the Dytiscide in its organization." That he acts thus with impartial fairness to two very aberrant genera, must be admitted, but I hope to show that in all the Adephaga there exist characters of very great systematic importance which have been entirely overlooked and which will define with great accuracy the relationship of the various families.

It must be evident to all that there are radical differences in the formation of the under side of the body in the now recognized families of the Adephagous series. Many of the characters making up these differences have been made use of by various authors and they have now become the common property of the science.

The structure of the metasternum demands a new study and here will be found the important characters to which I have already referred.

If we examine that portion of the body of a Cicindelide, Carabide or Haliplide, it will be observed that the metasternum consists of two distinct pieces, the anterior or that which makes up the greater part of that member and the posterior or ante-coxal piece separated from the former by a well marked suture extending entirely across the body. This line of separation has probably been considered merely a matter of sculpture but in some Carabidæ, especially the Ozænini, the two sternal pieces may be entirely separated by a short immersion in a solution of caustic potassa. In fact in these last named insects I am inclined to believe the suture somewhat mobile, as there is an evident laxity of articulation in the side pieces of the body as well as between the meso- and metasternum. The suture and piece intended will be seen on Pl. III, figs. 1—5.

In *Amphizoa* and *Pelobius* the structure is entirely different. There is but a very small ante-coxal piece with the suture in front of it very indistinct and the posterior side truncate and not prolonged between the coxæ as will be observed in the preceding families. This gives the metasternum the appearance of being truncate behind, a form of expression already made use of by various authors. This structure is shown on Pl. III, figs. 6—7.

In the Dytiscidæ and Gyrinidæ with their short metasternum there will be observed an entire want of any such structure. The ante-coxal piece is entirely absent without trace of suture, and the metasternum is pointed between the coxæ. The under sides of *Dytiscus* and *Dineutus* are represented on Pl. III, figs. 8—9.

The posterior coxæ also differ greatly in the various families. In all the coxæ are contiguous except in a comparatively few Carabidæ, the extent of the contact varying greatly from a mere angular touching to quite a long edge of contact. In the figure of *Cychrus* (Pl. III, fig. 1), the coxæ will be seen separated by a small triangle of the first ventral segment, *Pterostichus* (fig. 2), and *Mormolyce* (fig. 3), show a mere point of contact, while in the other genera on the plate the extent of contiguous edge varies, being greatest in *Dineutus*.

The coxæ reach the side margin of the body, separating the metasternal side pieces from the first ventral segment, in all the families excepting the Carabidæ and Cicindelidæ. *Trachypachys* of the former family makes an exception. With this extent of the coxæ externally we have associated an immobility of the coxæ, thus affording a firm point of support for the hind legs required by the mode of life of all the genera possessing it. The extent of median contiguity tends to

give still greater firmness. *Trachypachys* has the coxæ as mobile as in ordinary Carabidæ, there is however but a short line of median contact.

With the above notes and the characters already well known in the books an arrangement of the Adephagous families may be outlined in the following manner:

Metasternum with an ante-coxal piece, separated by a well marked suture, reaching from one side to the other and extending in a triangular process between the coxæ.

Antennæ eleven-jointed. Posterior coxæ mobile and simple. Habits terrestrial.

Antennæ inserted on the front above the base of the mandibles.

CICINDELIDÆ.

Antennæ arising at the side of the head between the base of the mandibles and the eyes. **CARABIDÆ.**

Antennæ ten-jointed. Posterior coxæ fixed and with large plates almost entirely concealing the abdomen. Habits aquatic.

HALIPLIDÆ.

Metasternum with a very short ante-coxal piece, the suture indistinct, posteriorly not prolonged between the coxæ. Habits aquatic.

Legs ambulatorial. Anterior coxæ globular.

AMPHIZOIDÆ.

Legs natatorial. Anterior coxæ conical. **PELOBIIDÆ.**

Metasternum prolonged behind in a triangular process, the ante-coxal piece entirely wanting. Habits aquatic.

Antennæ slender, filiform or setaceous. Abdomen with six segments.

Eyes two. **DYTISCIDÆ.**

Antennæ irregular, very short. Abdomen with seven segments, the first two closely united. Eyes four. . . . **GYRINIDÆ.**

The above scheme seems to give a division of families in accord with both structure and habits. I have used the expression "aquatic" in order that *Amphizoa* might be accommodated, its habits, while sub-aquatic, are by no means "natatorial." I have already given a sufficiently full account of the habits of this remarkable insect, (Proc. Ent. Soc. Phil. vi, p. 289), and will merely add in brief that it acts precisely like the Parnidæ and is equally poor as a swimmer, and a very awkward walker out of the water.

The Cicindelidæ, with the exception of a few genera, have the maxillæ armed at tip with a movable hook. This is peculiar to the family. For many years the books have presented *Trigonodactyla* of the Carabidæ as an exception and an articulated hook assigned to it. In the discussion

of the Ctenodactylini this will be shown not to be true, as illustrated by fig. 70. I have observed among the Manticorini, as represented by *Amblychila*, *Omus* and *Manticora*, that the posterior coxæ are separated, the intercoxal process meeting the metasternum by an obtuse articulation. The other tribes have these coxæ contiguous.

In a review of the opinions expressed by authors regarding other possible members of the Adephagous series we find the Paussidæ included by Burmeister (Mag. Zool. 1841, Ins. pl. 76), and the Rhysodidæ by Crotch (Proc. Amer. Philos. Soc. 1873). These must be excluded for many reasons, more especially as they fail to present the ventral structure which may be safely taken as the key. If we admit them there is no reason why some and after them all the Colydiidæ should not be admitted and the door would be open to much of the Clavicorn series. It must be admitted however that *Paussus* is the nearest approach of the Clavicorn series to the Adephaga the approximation in another direction being through the Byrrhidæ and Parnidæ with however a very wide interval.

Having established limits for the series as well as for the family Carabidæ, it will probably produce a better understanding of the subsequent pages if the various parts of the body are reviewed and their modifications studied, so that a correct idea may be obtained of the value to be assigned to each change of structure.

CARABIDÆ.

HEAD.—The head is usually oval, rarely very broad (*Pasimachus*, *Enceladus*, *Siagona*) or very elongate. In the latter case the elongation may be in front of the eyes as in *Cychrus* or behind them as in *Casnonia* and *Mormolyce*. The neck is often suddenly constricted and sometimes behind the constriction expanded to a semiglobular condyle which admits of very free motion of the head in every direction. The clypeus is usually narrower than the front and more or less prolonged but in the Licinini is not more prominent than the sides of the front. In *Dicrochile* and *Zargus* the central portion is membranous recalling the structure of that of *Necrophorus*.

The head is provided with setæ which seem to be special tactile organs and which from their constancy, as well in position as presence, have an important bearing from a systematic point of view. The supra-orbital setæ may be either two or one in number or even entirely wanting as in the Pseudomorphinæ. When there are two setæ the anterior is situated close to the border of the eye always in front of the middle, the posterior is at a distance within the eye opposite the posterior margin. If one seta

is present it may be close to the eye, usually it is a little removed, it is never in front of the middle.

The clypeus also bears setæ, usually one on each side and as a general rule those genera with two supra-orbital setæ have the clypeal seta situated at the middle of the side of the clypeus at a slight distance from the margin, while those with one supra-orbital have the clypeal near the anterior angle. Rarely there are more than one clypeal setæ at the side, as in certain *Anisodactylus* while in *Pelecium (cyanipes)* there is no seta whatever it being apparently replaced by a considerable development of the outer seta of the labrum.

EYES.—These organs are sometimes entirely absent, the instances are now rather numerous and well known. When present the form shows but little variation from the round or oval form (see Ozænini). Their size however varies greatly and with it the prominence, *Siagona* having very small eyes and in *Elaphrus* they are large and prominent. When the eyes are large relatively to the size of the head, whether unduly prominent or not, they approach very closely beneath the head to the edge of the buccal fissure, when small they are distant from the mouth. This seems to be very useful systematically but has not been made use of before the present paper. The granulation also varies but I have not been able to make use of this.

ANTENNÆ.—These are always eleven-jointed, usually filiform or setaceous, sometimes moniliform or compressed. The form seems to have less value from a systematic point of view than the extent of fine pubescence covering the surface of the joints. The antennæ have three kinds of pilosity, sometimes all present at the same time. First, a dense, fine, short, recumbent pubescence which is present on those joints with a fine, dense punctuation indicating probably the presence of a special sense identical with or resembling the sense of smell in animals of a higher organization. Second, a longer hairyness diffusely scattered over the joints, and finally stiffer hairs around the distal ends of the joints, these are especially well marked in *Loricera* and allied genera. The basal joint is not at any time very long but in the Scarites and Dryptini sufficiently elongate to attract notice, on the anterior face of this joint near the tip is a long seta. The extent to which the pubescence covers the antennæ has been used by many systematists since Lacordaire but there are so many striking exceptions within tribal limits that it can only be used for separating tribes and never for defining any higher groups. The surface of the antennæ is not always uniformly punctured. In those genera with the antennæ at all flattened, one or both sides have a median smooth

space. This is well marked in the Helluonini, *Pterostichus* and many Harpalini. The number of basal joints which may be glabrous varies from two to four, but in *Trachypachys* there is no pubescence whatever.

It is extremely rare that the antennæ are received in well marked grooves on the under side of the head. The Pseudomorphinæ are I believe the only instance of this.

LABRUM.—This member varies greatly in form and size. It is usually transverse truncate in front or slightly emarginate, ciliate or with four or six setæ along the margin. It is rarely bilobed (*Cychrus*, *Dicrochile*, *Zargus*), sometimes very large and convex (*Anthia*) or prolonged covering in great part the mandibles (*Pericalus*, etc.). In some genera the marginal setæ may be very small, *Anthia* or entirely wanting, *Macrochilus* and other genera of Helluonini.

MANDIBLES.—These are variable in form and prominence, within toothed, serrulate or simple. The tip is usually acute, the left mandible overlapping the right. Sometimes however (certain Harpalini) the mandibles meet in a pincer-like manner. The outer side is usually concave, forming an elongate groove (called the scrobe), in which usually beyond the middle is found a puncture bearing a moderate seta in those genera of riparial habits (*Nebria*, *Bembidium*, *Patrobis*, *Nomius*). The presence of this seta is extremely important in defining the relationship of genera otherwise obscure like *Melænus* and *Coscinia*. The scrobe is, however, sometimes absent as in the genera allied to *Pentagonica*.

MAXILLÆ.—In the present family the inner and outer lobes are always present as will be observed in the figures (it will be seen that the outer lobe is absent in *Dineutus*, 151). The inner lobe varies somewhat in form, it is usually hooked at tip, the hook *never* articulated. The tip may however be obtuse without hook as observed in Scaritini (19, 21, 22), Promecognathini (18), Pterostichini (45), Cratocerini (107), Orthogonini (*Anoncopeucus*), Peleciini (111), or more or less acute, without hook as in *Glyptus* (133). The inner edge is ciliate or spinulose and very rarely with anything approaching a tooth. The outer or palpiform lobe is biarticulate (except in *Callistus* 118, and *Amerizus* 38), the joints of variable relative length, the two together at least equal to the inner lobe, with the single exception of *Glyptus* 133, where they are shorter.

Of the *maxillary palpi* very little can be said in a general way. The accompanying sketches represent every known variety of form.

The maxillary lobes by their differences above mentioned afford merely

generic characters, while the form of the last joint of the palpus is used to separate tribes, but it is not a very safe character.

MENTUM.—The mentum closes the mouth more or less perfectly beneath usually allowing the outer side of the maxillæ at base to be seen. It is supported on a peduncle of the submentum the suture separating them usually very distinct, rarely entirely absent as in *Enceladus* 26, *Siagona* 31, *Lestignathus* 65, certain Trechi 40, 41, and the Pseudomorphinæ 147. The form of the mentum varies but no character of systematic value has been obtained from this excepting in the Scarites where it is very broad, or *Drypta* 76, from its nearly orbicular form.

The epilobes of the mentum are always present in the Carabidæ although much inflexed when the ligula is large as in *Pasimachus* 19. They vary greatly in size from a narrow border, as is the usual occurrence, to a very wide piece as in *Schizogenius* 23. Their extremities are often prolonged in an angle or even an acute process as in *Anophthalmus* 40, or *Perigona* 63. The epilobes have been made use of by Chaudoir in the Lebiini (*q. v.*) and Pogonini, in the former case erroneously in the latter with very little success.

The mentum is usually emarginate, sometimes very feebly or even *Brachylobus* 117, truncate. At the bottom of the emargination in very many genera a tooth of variable size and form occurs. The tooth is formed in two ways. It may be made entirely of a prolongation of the middle portion of the epilobes, or it may consist of a process of the body of the mentum narrowly bordered by the epilobes. This character as well as the form of the tooth will be found sufficiently represented in the sketches.

As a general rule when the mentum tooth is well developed the "post-dental" setæ are very small, often inconspicuous, when the mentum is deeply emarginate and the central portion of the epilobes membranous these setæ are unusually large and conspicuous, they are also well developed where the ligula is unduly exposed as in *Migadops* 16. I have but rarely represented these in the figures for fear of confusing more important parts of the mouth.

In the emargination of the mentum we usually find a connecting membrane which is the basal support of the ligula, and which varies in extent in accordance with the degree of extensibility of the ligula.

LIGULA or LABIUM.—It seems to me better that the latter name should be adopted for the entire organ as most authors in speaking of ligula may mean either the whole or merely the central member.

The labium consists of three parts, the central, usually corneous, piece on each side of which are membranous appendages called paraglossæ.

In every dissection I have made the three parts have always been present, sometimes however very closely united and corneous as in *Helluomorpha* 103. It seems unprofitable to discuss the modifications of the ligula and paraglossæ, their forms are shown in the figures and the explanations given in the tribal headings.

From my own observations I think the labium the most unsafe and unsatisfactory organ that can be made use of in classification and the poor results to be obtained from it need no further illustration than Lacordaire's system of Carabidæ. When the labium is used in the division of tribes into smaller groups and genera we have a microscopic subdivision resulting which overwhelms the science in a chaos of indefinable groups and an infinity of genera which threatens the exhaustion of the capacity of the classic languages for further combination.

A great part of the trouble with this organ seems to have resulted from causes which Jacquelin Duval so well describes, (Gen. Col. Eur. i, p. 34, note). When observed under varying external conditions the paraglossæ present rather diverse forms. They are often thin and membranous and will contract and expand with moisture and fail to present the same appearance when dry as when wet. My own dissections have been drawn while the specimens were moist, and in the smaller ones, enclosed in a drop of water.

The appendages of the ligula, the terminal setæ of varying number, seem useful in assisting the placing of genera when properly subordinated to other characters, but I think that genera based solely on the number of these setæ or their position must ultimately fail of recognition.

While I do not believe the ligula to possess the value assigned by some authors it may be made useful. In some vast groups like the Pterostichini and Platynini there is a similarity of type which one will readily recognize. There are however important modifications that need not mislead if properly studied, *Lestignathus* 65, is one of these. In this the ligula and paraglossæ are both well marked, the former feebly corneous, the latter slender and long but connected with the central ligula by a transparent membrane which serves to add strength to the organ which is at best very weak and thin.

LABIAL PALPI.—These organs are usually similar in their terminal joint to the maxillary palpi, when they differ it affords a very useful means of separating genera. It appears however to have escaped notice that the relative length of the last two joints to each other is a matter of far greater importance than has been recognized. The terminal joint may be equal to or longer than the preceding, or shorter. In the former

case the penultimate joint is bisetose in front and in the latter plurisetose. In the genera allied to *Oodes* 119, 120, 121, I have not found any setæ except in *Evolenes* 122, nor in *Chlænius pensylvanicus* 115, and *Glyptus* 133.

The entire groups Dryptini, Graphipterini, Anthiini, Zabrinini and nearly all the Harpalini have the penultimate joint plurisetose. The same character also occurs exceptionally in other tribes. The character seems to be an important one and has been useful in several of the tables.

PROTHORAX.—The form of the thorax plays but a subordinate part. The obliteration of the lateral margin in *Apotomus* seemed to Schaum to be very important but the same occurs in several remote genera, as *Agra* and *Casnonia*. The basal lobe by its presence has been useful in the Lebiini. The special setæ of the side margin are nearly as important as those of the head. In those genera with two supra-orbitals we can safely expect two at the side of the thorax one being in the hind angle, where there is one supra-orbital that of the hind angle is wanting except in *Bradycellus* and some few allied genera. All the Oodini, Anthiini, Graphipterini, Cratocerini, Orthogonini and *Glyptus* have no lateral setæ that I can discover nor trace of punctures from which they arise.

SCUTELLUM.—This is never large, sometimes entirely concealed (*Omophron*), and in the pedunculate genera confined to the peduncle. Its form is usually triangular.

ELYTRA.—These organs by their form play an important part in the Harpalinæ, in accordance with the form of the apex whether entire, sinuate or truncate, also the structure of the base whether margined or not. The internal plica, which will be more fully explained further on, has been recognized by Bedel in his tables, but its full import does not seem to have been recognized. Its use seems to be, to hold the elytra more firmly together by an interlocking with the margin of the abdomen.

The elytral sculpture is of course very variable, the normal form is nine-striate but the striæ in *Cychrus* far exceed this number. Sometimes the eighth and ninth striæ are confluent or nearly so as in *Oodes*. The eighth on its outer side bears ocellate punctures which in very recent specimens bear long setæ as shown in *Psydrus* (Pl. IV, fig. 1). The ocellate punctures are wanting in our Panagæini, in *Apotomus* and many Carabinæ.

PROSTERNUM.—The modifications of this portion have proven especially useful in the Carabinæ as will be seen by reference to

the table. In the Harpalinæ it is of less importance generically. In *Cyclosomus* the tip is much prolonged and acute.

ANTERIOR COXÆ.—The cavities receiving these are always closed except in a small number of tribes of Carabinæ. In many cases the positive determination of open or closed cavities can only be made by separating the prothorax.

MESOSTERNUM.—The mesosternum separates the middle coxæ narrowly, not often widely (*Siagona* and some Carabinæ), rarely the coxal cavities are confluent (certain Ozænini). In front it is usually oblique or nearly flat, rarely protuberant and carinate (some Carabinæ). The side pieces, epimera and episterna, by their form and extent give to the division of the entire family one of its most important characters. In the first sub-family Carabinæ the epimera nearly equal the episterna in size and reach the coxal cavity. In the other two sub-families the epimera vary in width but do not reach the coxæ, and in some tribes are extremely narrow, in fact linear or even partly hidden externally by the episterna.

Mormolyce is one of the most remarkable exceptions in the entire family. It is plainly by its structure otherwise, allied to the *Truncatipenne* series but the mesosternal epimera reach the coxæ; nor does the exception end here, the metasternal episterna also form part of the outer side of the coxal cavity, a character otherwise unknown in the Adephaga outside of the *Dytisci complicati* (Pl. III, fig. 3). This gives an answer to the closing lines of Dr. Sharp's paper. (Comptes rendus Ent. Soc. Belg. Sept. 1880).

METASTERNUM.—This segment yields nothing of importance in the classification of the family, its structure has given us the means of dividing the Adephaga in a satisfactory manner. The side pieces are of less importance than those of the preceding segment, the fusion of the two pieces in one has been made use of but its importance exaggerated. I have seen in the same species the epimera free or united with the episterna without suture (*Metrius*).

POSTERIOR COXÆ.—While it has been observed that the middle coxæ are sometimes contiguous, it seems to have escaped notice that the posterior are equally variable. In the vast majority of genera the coxæ are contiguous although at times the contact is small and produced by a slight extension inward of a small process of the coxæ as shown in Pl. III, fig. 2. The metasternum and abdomen are however completely separated, as effectually as in those genera in which the contact is larger. This is the form observed in Pterostichini, Lebiini and

Harpalini. In a comparatively few genera the coxæ are plainly separated and the small triangle of the first ventral segment becomes visible between them. This character is scattered in all parts of the series. In *Brachynus* it seems to lose its value as species occur with the coxæ contiguous or separated. In *Trachypachys* alone the coxæ externally reach the side margin of the body. This character is usual in all the following families but unique here.

ABDOMEN.—There are always six segments, the first lateral. Their length varies but not to an extent to afford systematic characters. In *Brachynus* there are said to be seven or eight segments but this is sufficiently discussed in that tribe.

Each of the first five segments bears near its posterior edge and on each side of the middle a puncture bearing an "ambulatorial seta." The last ventral is apt to vary sexually in its punctuation and the males will be seen to have but one puncture each side and the females two. Other sexual modifications of the last ventral are often observed, but these have more often a specific than generic value.

LEGS.—The only specially important variation is found in the anterior tibiæ whether emarginate or not on the inner side and with this the position of the terminal spurs. In some genera the anterior tibiæ are grooved on the inner side in the axis of the member, these have the spurs of necessity terminal. It will be observed then that the greater the obliquity of the groove the more one spur is elevated so that when the emargination is most perfectly developed the inner spur is at the upper angle of the emargination. The tibial spurs are always present, sometimes very short (*Agra*), or very long (*Tetragonoderus*), and in the latter genus finely serrulate. There are two spurs, never more, notwithstanding the assertion to the contrary in *Zabrus*.

TARSI.—The feet are five-jointed without exception, the joints varying among themselves in form and size, and many times afford a useful resort for separating genera. The vestiture of the under side is variable generically and again sexually. The mode of dilatation of the anterior male tarsi and the vestiture of the dilated joints whether squamulose, papillose, pubescent, spongy or spinous, gives at times the only constant character for the separation of groups of genera.

As a rule the anterior tarsi of the male are dilated in from two to four joints while it often happens that the sexes can not thus be separated.

UNGUES.—The claws are more often simple than otherwise but numerous instances occur in which they are dentate, serrate or pectinate. These variations are useful for the separation of genera.

FACIES.—Species of a genus and genera of a tribe have a greater or less resemblance which affords to the practiced eye an easy guide to position, but there are in many parts of the series such close repetitions of form that this can not be relied on. *Tetragonoderus* and *Bembidium*, *Patrobis* and *Nebria*, *Dyschirius* and *Apotomus*, *Cyclosomus* and *Omophron*, are instances of this mimicry. On the other hand allied genera will be found presenting diversity of aspect and some may be polymorphic as to their species, as *Carabus* and *Cychrus*.

With this review of the separate parts of the body the preliminary portion of this essay closes. I have purposely avoided citing many instances of the occurrence of each character as the genera are unknown to most of the students of our fauna and our native genera have been cited when they answer the purpose.

The Carabidæ may be divided in the following manner into three sub-families :

Middle coxal cavities not entirely enclosed by the sterna, the epimeron of the mesosternum attaining the coxa. *CARABINÆ*.

Middle coxal cavities entirely enclosed by the sterna, the epimeron not attaining the coxa.

Head without antennal grooves beneath and with distinct supra-orbital setæ. Ambulatorial setæ of abdomen usually well developed.

HARPALINÆ. 12 ✓

Head with distinct usually long antennal grooves beneath and without distinct supra-orbital setæ. Ambulatorial setæ of abdomen feeble or wanting. *PSEUDOMORPHINÆ*.

The only exceptions known to me in the structure of the middle coxal cavities is in *Mormolyce*, of which mention has already been made. The *Ozænini* and *Siagonini* have been considered exceptions but by careful preparation of specimens I have found the coxal cavities as in the Harpalinæ. In the proper place these matters will be found more fully discussed.

Sub-Family *CARABINÆ*.

Middle coxal cavities partially closed by the sterna the intervening space occupied by the mesosternal epimeron. Head with one or two supra-orbital setigerous punctures. Sides of thorax usually with two setigerous punctures. Anterior tibiæ either entire, obliquely grooved or emarginate, the spurs either both apical or with the inner more or less remote.

The tribes of this sub-family contain a less number of genera than the Harpalinæ, but of such a specialized type as to make it necessary to separate them to such an extent that many of the tribes contain but one genus.

The following table gives in brief the characters which separate the tribes:

- Posterior coxæ attaining the side margin of body. Anterior coxal cavities open behind. Mandibles with setigerous puncture.....Tribe II. **Trachypachini**.
- Posterior coxæ not attaining the side margin of body.
Anterior coxal cavities open behind.
Posterior coxæ separated. Labrum bifurcate.....Tribe III. **Cychrini**.
Posterior coxæ contiguous. Labrum not bifurcate.
Mandibles without setigerous puncture externally.
Spurs of anterior tibiæ terminal.....Tribe IV. **Carabini**.
Inner spur above the outer.
Outer apical angle of anterior tibiæ prolonged. First antennal joint moderate.....Tribe V. **Pamborini**.
Outer angle not prolonged. First antennal joint long.....Tribe VI. **Hiletini**.
Mandibles with setigerous puncture.....Tribe IX. **Nebriini**.
Anterior coxal cavities closed behind.
Prosternum prolonged and dilated, entirely concealing the mesosternum.
Mandibles with setigerous puncture. Scutellum entirely concealed.
Tribe I. **Omophronini**.
Prosternum not concealing the mesosternum.
Antennæ free at base.
Mandibles without setigerous puncture. Anterior tibiæ strongly emarginate.
One supra-orbital seta.....Tribe VIII. **Loriccerini**.
Mandibles with setigerous puncture. Anterior tibiæ feebly emarginate. Two supra-orbital setæ.....Tribe VII. **Elaphrini**.
Antennæ arising either under a distinct frontal plate or a ridge which extends backward over the eyes.
Body not pedunculate, the bases of thorax and elytra in contact.
Posterior coxæ contiguous. No mandibular seta. Prosternum acute.
Tribe X. **Migadopini**.
Posterior coxæ separated.
Prosternum prolonged at tip. Mandibles with seta.....Tribe XI. **Metriini**.
Prosternum not prolonged. Mandibles without seta.
Tribe XII. **Mystropomini**.
Body pedunculate, bases of thorax and elytra remote.
Posterior coxæ separated.
Anterior tibiæ emarginate within, the inner spur remote from the outer.
Mentum with distinct suture at base.....Tribe XIII. **Promecognathini**.
Anterior tibiæ obliquely grooved within, the spurs terminal and nearly on the same plane. Mentum closely connate with the submentum.
Tribe XIV. **Enceladini**.
Posterior coxæ contiguous.
Anterior tibiæ emarginate within, the outer apical angle prolonged.
Tribe XV. **Scaritini**.

Of the above tribes ten are represented within our faunal limits and but one of these, *Metriini*, is peculiar to it as far as the genera of the sub-family are known to me.

It is impossible to give these tribes a linear arrangement without

violating some of the affinities but the numerical sequence above seems to be the least objectionable.

Representatives of all have been studied from nature except Hiletini, so rare seem the species that with all my exertion I have been unable to procure one of them.

I can hardly allow the present occasion to pass without expressing my great sense of obligation to Messrs. Bates and the Jansons of London, Sallé of Paris, and Dr. Dohrn of Stettin, for their ready response to my calls for rare and valuable material.

Tribe I.—*Omophronini*.

Antennæ slender, inserted under a slight frontal margin, four basal joints glabrous. Eyes round, moderately prominent, distant beneath from the buccal opening. Head deeply inserted, with one supra-orbital seta. Labrum short, emarginate. Mandibles not prominent, arcuate, acute at tip, simple within or slightly toothed near the base, outer side slightly concave with a setigerous puncture. Maxillæ slender, inner lobe hooked at tip, spinulose within, outer lobe slender biarticulate, palpi slender the last two joints equal. Mentum deeply emarginate and with an acute tooth, ligula truncate and slightly broader at tip and bisetose, the paraglossæ free at tip but not longer, the palpi slender, second joint longer than the terminal and plurisetose in front. Thorax applied directly against the base of the elytra, sides with a single setigerous puncture a little behind the middle. Scutellum invisible. Elytra convex, margined at base, sides narrowly inflexed margin continuous. Prosternum rather widely separating the coxæ, prolonged and dilated behind them and completely covering the mesosternum the coxal cavities closed behind. Mesosternum in front vertical and carinate with two fossæ to receive the under side of the anterior coxæ. Metasternum short, epimera not distinct, posterior coxæ contiguous. Tibiæ finely spinulose externally, the anterior slightly broader to tip, within obliquely grooved, the inner spur above the apex. Tarsi slender.

The males have one or two joints of the anterior tarsi dilated and spongy pubescent beneath.

One genus constitutes this tribe, *Omophron*, concerning which all authors seem to be in accord in permitting it to remain alone.

At first glance the posterior coxæ seem to be separated, but a little care will readily detect the small laminiform processes which by their meeting conceal the small remnant of the first ventral segment.

European authors describe the ligula and paraglossæ somewhat differently but the figure given is that which will be found in *O. dentatum* Lec.

The plurisetose second joint of the labial palpi is a character of extremely rare occurrence in the present sub-family, it is the usual structure in Cicindelidæ and very constant in Dryptini and Harpalini of the sub-family Harpalinæ.

The affinities of the present tribe are very difficult to define. It seems out of place in any part of the series. Specialization of type

seems to be carried to such an extreme in the present sub-family that tribes may be separated containing one or at most two genera, except in the Scaritini and possibly the Migadopidæ as defined by Chaudoir.

Tribe II.—**Trachypachini.**

Antennæ moderate, arising under a distinct frontal margin, the joints all glabrous with a few hairs near the tip of each, first joint stout but short, third very little longer than the second. Eyes oval, not prominent, moderately distant from the buccal fissure. Head deeply inserted in the thorax, with two supra-orbital setæ. Labrum short, broadly but feebly emarginate. Mandibles stout, arcuate, concave on the outer side and with a setigerous puncture. Maxillæ with inner lobe stout, falciform, ciliate and spinous within, outer lobe rather stout, with two equal joints, palpi stout, the second and fourth joints equal, the third a little shorter. Mentum short, broad, with distinct suture at base, anteriorly feebly emarginate with an emarginate tooth. Ligula broad, rounded and bisetose at tip, the paraglossæ membranous, obtuse at tip, slightly longer than the ligula, the palpi short, the second joint with one seta in front, the third elongate-oval. Thorax with three setigerous punctures at the sides, the first at apical angle, the second at middle, the third at basal angle. Body not pedunculate, scutellum distinct. Elytra not margined at base, sides narrowly inflexed, margin not interrupted. Prosternum horizontal at tip prolonged behind the coxæ, the coxal cavities open behind, prosternal sutures indistinct. Mesosternum oblique and with a carina in front between two fossæ which receive the anterior coxæ. Metasternal epimera invisible, the posterior coxæ contiguous within and reaching the side of the body separating the metasternal side pieces and the abdomen. Legs not long, femora stout, middle and posterior tibiæ spinous externally, anterior tibiæ spinous posteriorly, gradually stouter to tip, sulcate and feebly emarginate, the inner spur above the tip.

The anterior tarsi of the male have two joints feebly dilated and spongy pubescent beneath.

This tribe contains two genera *Trachypachys* and *Systolosoma*, the former occurring in our fauna and Europe, the latter in Chili.

The characters above given show such an apportionment of those peculiar to the sub-family, with the addition of one not found in any of the tribes of Carabidæ, that it is difficult to say in which direction the affinities are most marked, but those toward the Nebriini and Elaphrini seem to be the most evident. As in all the other tribes of the present sub-family the affinities seem to be complex, and will appear stronger or weaker in accordance with the standpoint from which we view them.

The form of the posterior coxæ is the character more especially noteworthy in this tribe. These members are not of unusual dimensions but extend to the margin of the body, their line of contact with each other is also greater than is usual in the entire family.

In the Berlin Zeitschr, 1860, p. 166, Schaum states that *Trachypachys* has three spurs to the anterior tibiæ, two terminal and one above the emargination, and on p. 167 the same is said of *Metrius*. From my

own observation no coleopterous insect ever has more than two spurs to each tibia except by monstrosity, consequently the above statements are incorrect.

Tribe III.—Cychrini.

Antennæ slender, setaceous, four basal joints glabrous (two only in *Nomaretus*), inserted under a feeble frontal ridge; first joint long and often stout, third longer than second. Eyes round moderately prominent, distant beneath from the buccal opening. Head more or less constricted, with one setigerous puncture above the eye, neck often semiglobose. Labrum deeply bifurcate. Mandibles long and prominent, arcuate and acute at tip, and at least bidentate within, and with no setigerous puncture externally. Ligula acute and bisetose at tip, the paraglossæ variable. Labial palpi long, the second joint elongate, plurisetose in front, last joint securiform and concave. Maxillæ with inner lobe slender, hooked at tip, ciliate or spinous within, the outer lobe stout with the terminal joint longer, the palpi long and slender, the last joint securiform and concave. Mentum deeply emarginate without tooth. Thorax variable in form with a lateral and antebasal setigerous puncture. Body not pedunculate, scutellum scarcely evident. Elytra not margined at base, sides rather widely inflexed, margin acute and not interrupted. Prosternum usually not prolonged behind the coxæ the tip obtuse, the coxal cavities open behind. Mesosternum nearly vertical and obtusely carinate in front. Metasternal epimera not distinct. Posterior coxæ separated by a triangular process of the abdomen. Legs long usually slender, the femora usually very feebly clavate. Anterior tibiæ very slightly broader to apex, grooved within near the apex, the spurs terminal but placed slightly obliquely to each other. Tarsi slender, the first joint long, the fourth entire.

Anterior tarsi usually dilated in the males with a variable number of joints spongy pubescent beneath.

As above defined the present tribe contains those genera included by Lacordaire excepting *Damaster* which Chaudoir has properly removed to the Carabini. Probably misled by the presence of *Damaster*, Schaum has suggested the union of the present tribe with the Carabini, but the characters separating the two are so well marked and sharply defined that they must be retained as distinct.

The separation of the posterior coxæ which seems to have escaped notice here as well as in several of the following tribes is a character of too great importance to neglect. It is repeated in *Metrius*, *Promecognathus* and *Enceladus*, but there exists too wide an interval between the Cychrini and these genera for us to suggest any special affinity with either of them. With the Carabini the Cychrini appear to have the closest relationship.

Two genera form this tribe, both represented in the United States.

Antennæ with four basal joints glabrous..... **Cychrus.**
Antennæ with two basal joints glabrous..... **Nomaretus.**

Cychrus as above defined is rather polymorphic and is capable of division into parts which rank rather as sub-genera than genera. Those

occurring in our fauna have been the subject of a study by me in which these divisions have been treated in sufficient detail (Trans. Am. Ent. Soc. 1878, pp. 168—185).

Two important divisions may however be noticed, those in which the anterior tarsi are similar in the sexes and slender, and those with the anterior tarsi dilated in the males. To the first of these series belong the European species and three in our own fauna which occur west of the Rocky Mountains. Those with dilated tarsi are peculiar to our fauna. These two series seem to bear the same relationship to each other that *Damaster* does to *Carabus*.

In *Nomaretus* and one group of *Cychrus* (*Sphæroderus*), the tip of the prosternum is somewhat prolonged and Chaudoir holds the opinion that, from this fact and the more widely dilated tarsi of the male, the group should have generic value. I do not see any necessity for this, for if we attempt to divide *Cychrus* more than two divisions will be required and the subject unnecessarily complicated.

Tribe IV.—*Carabini*.

Antennæ slender, with four basal joints glabrous, arising under a feeble frontal ridge. Eyes round moderately prominent and distant beneath from the buccal opening. Head not constricted behind the eyes and with one supra-orbital setigerous puncture. Labrum broad and emarginate. Mandibles stout, arcuate, acute at tip, concave on the outer side and without setigerous puncture. Mentum broad, emarginate, with a variable tooth. Ligula variable, the paraglossæ distinct. Maxillæ with inner lobe strongly hooked, densely ciliate within, outer lobe stout. Palpi moderate or long, last joint of both pairs securiform. Thorax with a setigerous puncture at the side and one also near the posterior angle. Body not pedunculate, scutellum small. Elytra feebly embracing the sides of the body, the lateral margin continuous. Prosternum horizontal at tip and prolonged, the anterior coxal cavities open. Mesosternum nearly vertical and subcarinate in front. Metasternal epimera invisible, posterior coxæ contiguous. Anterior tibiæ gradually broader to tip, slightly grooved within, the spurs terminal but placed obliquely to each other. Femora moderate, the anterior stouter. Middle and posterior tarsi long and slender, the anterior shorter.

In the males the anterior tarsi are dilated and densely pubescent beneath, the dilated joints variable in number, simple in both sexes in *Damaster*.

This tribe is composed of species of at least medium or even of large size, remarkable for the most part for their beauty of form, color and sculpture. As here defined it contains those genera not of the Nebriide type with the addition of *Damaster*. This latter genus as remarked by Schaum (Ann. Fr. 1862, p. 68), differs from *Carabus* merely in the absence of dilated tarsi in the male. The entire structure is so closely that of *Carabus* and so different from *Cychrus* that it seems almost impossible that Lacordaire should have associated it with the latter genus.

I entirely agree with Chaudoir (Bull. Mosc. 1861, p. 502), in placing *Damaster* in the present tribe.

Within our faunal limits but two genera occur separated by the form of the third antennal joint.

Third joint of antennæ cylindrical.....**Carabus.**
Third joint of antennæ compressed.....**Calosoma.**

In their numbers of species these genera in our fauna reverse that of Europe where *Carabus* is far more numerous than *Calosoma*, with us the latter genus has the greater number of species but the disparity between the genera is not so great as in Europe.

Tribe V.—**Pamborini.**

Antennæ straight, moderate in length, arising under a distinct frontal margin; first four joints glabrous, first joint slightly elongate, third longer than second. Eyes not large, moderately prominent, distant from the buccal fissure. Head narrowed behind the eyes to a distinct neck and with a single setigerous puncture over each eye. Labrum transverse, deeply but broadly emarginate. Mandibles arcuate, acute at tip, strongly dentate within, without setigerous puncture. Mentum short, broad, narrowed in front, broadly but feebly emarginate, epilobes narrow but distinct, mental suture distinct. (Ligula and maxillæ not dissected.) Labial palpi robust, the terminal joint longer, elongate securiform, second joint without setæ. Maxillary palpi similar but with the second joint longer than the fourth. Thorax somewhat narrowed behind the hind angles slightly prolonged, a setigerous puncture at middle of sides another near the hind angle. Body not pedunculate, scutellum short and broad. Elytra not margined at base, lateral margin entire, sides moderately inflexed. Prosternum horizontal and prolonged at tip, anterior coxal cavities open behind. Mesosternum nearly vertical obtusely carinate in front. Metasternal epimera indistinct, posterior coxæ contiguous. Femora moderate, the anterior slightly stouter. Anterior tibiæ broader to tip, the outer apical angle prolonged, deeply grooved on the inner side, the inner spur situated considerably above the outer. Tarsi slender, the first joint equal to the next three together, fourth joint slender.

Anterior tarsi slender and similar in both sexes.

This tribe contains but one genus peculiar to Australia, *Pamborus*. Lacordaire has associated *Teflus* with it, but by what process of reasoning I have been unable to determine and which has been very properly separated by Chaudoir and associated with *Panagæus*. By the open anterior coxal cavities, the form of the mesosternum and the contiguous posterior coxæ, *Pamborus* exhibits a decided relationship with the Carabini, but the structure of the anterior tibiæ and the more widely inflexed elytra are abundantly sufficient to separate it as a distinct tribe. By the latter character a relationship is exhibited with the Cychrini and by the anterior tibiæ with Scaritini. It might also be observed that the structure of the head above resembles *Pelecium* but beyond the resemblance there is no further affinity.

Tribe VI.—*Hiletini*.

Antennæ moderate in length, inserted under a well marked frontal plate, geniculate, the first joint elongate, received in repose in a depression beneath the eyes. Head oval, stout, with two supra-orbital setæ. Eyes small not prominent. Labrum transverse feebly emarginate. Mandibles broad, arcuate externally and curved from above downwards and without seta on the outer side, pluridentate within. Maxillary palpi securiform ♂ or triangular ♀. Mentum broad, deeply emarginate with a large quadrifid tooth. Ligula elongate, spatuliform, rounded at tip, the paraglossæ shorter, linear and ciliate, terminal joint of the palpus more strongly securiform in the male. Thorax subcordiform. Elytra parallel feebly convex. Prosternum prolonged at tip and received in a depression of the mesosternum, anterior coxal cavities open behind. Metathoracic epimera distinct. Legs moderate. Anterior tibiæ entire, the spurs terminal. Tarsi short. Posterior coxæ not contiguous.

The first three joints of the anterior and middle tarsi of the male are feebly dilated and spongy beneath.

The tribe contains but one genus *Hiletus* which is unknown to me in nature, the above characters have been obtained from the books in great part, to which I have added others kindly observed for me by Mr. H. W. Bates.

The relations of the tribe, like many others of the sub-family, are complex, but on the whole it seems better placed near the Pamborini and Carabini than elsewhere.

Tribe VII.—*Elaphrini*.

Antennæ moderate in length, rarely longer than head and thorax, three basal joints glabrous, the fourth pubescent at tip or entirely glabrous in *Diachila*, base free, a slight ridge in *Blethisa*. Eyes round, usually prominent, moderately distant from the buccal fissure. Front more or less deflexed, with two supra-orbital setæ. Labrum moderate, truncate. Mandibles stout, concave externally, with a setigerous puncture, arcuate, acute at tip. Maxillæ hooked at tip, ciliate or spinulose externally, outer lobe slender biarticulate, palpi moderate in length, terminal joint longer than the preceding. Mentum emarginate with a bifid or emarginate tooth, ligula free at tip, bisetose, acute in *Elaphrus*, broad in the other genera, paraglossæ slender longer than the ligula, the palpi moderate, the last two joints equal the penultimate bisetose in front, except in *Diachila*. Thorax variable in form, the seta in the posterior angle always present, the lateral absent in most *Elaphrus*. Body not pedunculate, scutellum distinct. Elytra not margined at base except feebly near the humeri in *Blethisa*, sides narrowly inflexed, margin entire. Prosternum obtuse at tip not prolonged behind the coxæ, the coxal cavities closed. Mesosternum not prominent. Metasternal epimera not distinct, the posterior coxæ contiguous. Legs moderate. Middle and posterior tibiæ slightly spinulose externally, the anterior obliquely grooved, the inner spur above the apex. Tarsi slender.

This tribe contains the three genera quoted above, and I suspect that some if not all of those placed by Chaudoir in his Migadopidæ should be added unless the ligular structure is allowed to have weight in their separation. The affinities of the tribe are feeble except in the direction of the Nebriini.

The genera are separated in the following manner :

Mentum tooth large, nearly as long as the lateral lobes, emarginate. Thorax without lateral seta. Elytra with variolate foveæ, not striate...**Elaphrus.**

Mentum tooth short bifid at tip. Thorax with lateral setigerous puncture.

Head not sulcate, elytra with feeble striæ of punctures.....**Diachila.**

Head with deep lateral grooves, elytra striate with interstitial foveæ...**Blethisa.**

ELAPHRUS.—The affinities existing between this genus and *Opisthius* have been referred to in the proper place. It is remarkable that the lateral seta of the thorax is absent in all the species of this genus except *viridis* Horn, which is the only one in our fauna with the thorax wider than the head including the eyes. In the larger species the males have four joints dilated, in the smaller but three.

DIACHILA.—Two species occur in our fauna, *arctica* Gyll., common to both Europe and America, and *subpolaris* Lec., from Hudson's Bay. The anterior tarsi of the male have four dilated and spongy pubescent joints and in *subpolaris* the middle femur has a small tooth near the base.

BLETHISA.—Four joints of the anterior tarsi are slightly dilated and spongy pubescent beneath in the male, and in *quadricollis* Hald., the anterior femora have an acute tooth beneath.

Tribe VIII. **Loricerini.**

Antennæ slender, base free, first four joints glabrous, first joint elongate, third longer than second, joints 2—6 with long bristles in front. Eyes round, prominent. Head forming a distinct neck and with one supra-orbital seta. Labrum moderately prominent, arcuate in front. Mandibles thin, curved, acute at tip, without setigerous puncture. Maxillæ with a moderate foliaceous expansion at base which bears long ciliæ, inner lobe hooked at tip, sparsely ciliate within, outer lobe with slender joints, palpi slender the last joint longer than the preceding and acute. Mentum moderately emarginate with an obtuse tooth, basal suture distinct. Ligula not prominent, slightly prolonged in front and bisetose, the paraglossæ adherent in their entire length and not longer, the palpi slender the last two joints nearly equal, the penultimate bisetose in front. Thorax transversely cordate, with a single setigerous puncture at the side behind the middle. Body not pedunculate, scutellum distinct. Elytra margined at base, sides narrowly inflexed, lateral margin entire but with a distinct internal plica. Prosternum not prolonged behind, the anterior coxal cavities closed. Mesosternum oblique not carinate in front. Metasternal side pieces distinct the suture between them well marked, posterior coxæ contiguous. Legs slender, middle and hind tibiæ spinulose externally, anterior tibiæ deeply emarginate within, the inner spur remote from the apex. Tarsi slender.

The anterior tarsi of the male have three joints rather broadly dilated and densely spongy pubescent beneath.

This tribe contains but one genus *Loricera*, in our fauna, with which *Elliptosoma* Woll., a Maderan form has been associated. These are said to differ in the absence of metasternal epimera in the former

and their presence in the latter, but in all the specimens of *Loricera* I have examined the suture between the episterna and epimera are quite distinct.

Associated for a time with the Panagæides, *Loricera* has been properly removed by Schiøedte, Schaum and Chaudoir. While it must be considered a member of the present sub-family allied to the Elaphrini and Nebriini, it presents two striking characters at variance with all the tribes of Carabinæ and which approach it to the Harpalinæ, the deeply emarginate anterior tibiæ and the presence of the internal elytral plica which is so well marked in Pterostichini and Panagæini.

Tribe IX.—Nebriini.

Antennæ with four basal glabrous joints, inserted under a slight frontal plate which is not extended backward over the eyes in a supra-orbital ridge. Eyes round, moderately or very prominent, distant from the buccal opening beneath, less however in *Leistus* and *Notiophilus*. Head horizontal (front deflexed in *Opisthius* and with two supra-orbital setæ), and with one supra-orbital seta. Parts of mouth variable, mandibles always with setigerous puncture. Thorax usually with a setigerous puncture at the side and hind angle, both are absent in *Opisthius*, and the posterior in *Leistus*. Elytra margined at base except in *Opisthius*, sides narrowly inflexed, margin entire. Prosternum horizontal and prolonged behind the coxæ, the cavities open behind; lateral suture of thorax beneath normally distant from the margin except in *Opisthius*. Mesosternum carinate in front. Metasternal epimera indistinct, posterior coxæ contiguous. Legs slender, middle and posterior tibiæ spinulose or ciliate externally. Tarsi slender, ciliate beneath.

The parts of the mouth are so variable that I will give in brief the principal characters:

LEISTUS.—Labrum prominent, arcuate at tip. Mentum feebly emarginate with a short emarginate tooth. Ligula prominent narrowed at tip and then trifurcate, bisetose behind the trifurcation, the paraglossæ short with their tips free. Labial palpi long and slender the second joint longer than the last, without setæ in front. Mandibles broad, explanate at the sides, acute at tip. Maxillæ with slender processes on the outer side of variable length each bearing a stiff seta at its tip, the palpi slender. The first three joints of the anterior tarsi of male are dilated and with squamules beneath.

OPISTHIUS.—Labrum short, transverse, more prominent at middle. Mentum moderately emarginate, the tooth moderately long with nearly parallel sides, feebly emarginate at tip. Ligula small concealed behind the mentum tooth, narrowed at tip, slightly bifid and bisetose, the paraglossæ slender arcuate and longer than it. Labial palpi slender the last two joints nearly equal, the terminal finely ciliate externally, the preceding bisetose in front. Maxillæ ciliate within, the palpi slender. Mandibles rather stout arcuate and acute at tip, outer side not concave.

Anterior tarsi of male with four joints feebly dilated and densely spongy pubescent beneath.

NOTIOPHILUS.—Labrum moderately prominent arcuate in front. Mandibles stout not prominent, acute at tip. Maxillæ feebly ciliate internally the palpi moderate the terminal joint but little longer than the preceding. Mentum moderately deeply emarginate, the tooth notched, ligula prominent, the tip slightly prolonged and bisetose, paraglossæ slender, arcuate, longer than it, the palpi with last two joints nearly equal, the penultimate bisetose in front. The first three joints of the anterior tarsi are feebly dilated and spongy pubescent beneath.

NEBRIA.—Labrum truncate or feebly emarginate. Mandibles acute at tip, not concave externally. Maxillæ ciliate at base, the palpi slender the terminal joint a little longer than the preceding. Mentum deeply emarginate with a bifid tooth, ligula not prominent the tip truncate or slightly prolonged and bisetose, the paraglossæ usually adherent in their entire extent, sometimes slightly free at tip, the palpi moderate, the penultimate joint bisetose in front. The anterior tarsi of the males have three joints feebly dilated and pubescent beneath.

PELOPHILA.—Characters nearly as in *Nebria* with the last joint of the palpi more oval. First three joints of anterior tarsi of male rather broadly dilated and densely pubescent beneath.

The above characters seem to show the danger of attaching too great value to characters drawn from the ligula and paraglossæ as a basis for the arrangement of the genera of Carabidæ.

In *Notiophilus* the anterior tibiæ are very obliquely truncate the inner spur above the apex. In the other genera both spurs are terminal but placed slightly obliquely to each other.

The genera which occur in our fauna belonging to this tribe are as follows:

Front deflexed, head with two supra-orbital setæ, spurs of anterior tibiæ terminal.

Elytra with ocellate foveæ, not margined at base.....**Opisthius.**

Front horizontal, head with one supra-orbital seta. Elytra margined at base.

Anterior tibiæ very obliquely truncate, the inner spur above the apex. Vertex sulcate.....**Notiophilus.**

Anterior tibiæ scarcely obliquely truncate, spurs terminal.

Mandibles explanate at the sides, maxillæ at base with spine-bearing processes.....**Leistus.**

Mandibles stout, not explanate, maxillæ not appendiculate and merely setose at base.

Anterior tarsi of male feebly dilated.....**Nebria.**

Anterior tarsi of male broadly dilated.....**Pelophila.**

In addition to the peculiarities already mentioned it might be observed that while, all the genera above mentioned (except *Notiophilus*), place

their antennæ backward over the body in a more or less curved position when in repose, in *Notiophilus* the antennæ are bent down under the head and encircle the margin of the eye.

The affinities of this tribe are more marked in the direction of the Elaphrini than elsewhere, and it may be especially observed that all those characters which separate *Opisthius* from the other genera are found in *Elaphrus*, the ligula and paraglossæ of these two genera are also similar.

Baron Chaudoir (Bull. Mosc. 1861, i, pp. 492 and 502), separates the above genera making *Notiophilus* a separate tribe and placing the others as a sub-tribe of Carabini. If it be considered advisable to divide the above tribe, *Opisthius* and *Notiophilus* are equally worthy of representing distinct tribes. The union of the tribe with Carabini seems to me unnatural from the appearance of the genera as well as from their characters.

Tribe X.—*Migadopini*.

Antennæ slender, arising under a slight frontal ridge, four basal joints glabrous. Eyes round, not prominent, moderately distant from the mouth beneath. Head short, broadly oval, clypeus distinct and with a setigerous puncture each side distant from the margin, one supra-orbital seta. Labrum short, truncate, quadrisetose in front and ciliate at the sides. Mandibles acute at tip, feebly arcuate, without setigerous puncture externally. Maxillæ arcuate at tip, spinulose within, outer lobe biarticulate, palpi stout, the terminal joint somewhat oval, obtuse at tip. Mentum short and broad, emarginate, with a broad emarginate tooth nearly as long as the lateral lobes, ligula oval, bisetose at tip, the paraglossæ moderately broad and adherent in their entire length, palpi moderate, terminal slightly longer and truncate at tip, the penultimate bisetose in front. Thorax broad, hind angles distinct, no lateral setæ. Elytra slightly margined at base, sides narrowly inflexed, margin continuous. Prosternum acute at tip and prolonged, concave beneath and covering the middle of the mesosternum, anterior coxæ closed behind. Middle coxæ moderately separated, the mesosternal epimera very indistinctly separated from the episterna but attaining the coxal cavity. Metasternal epimera indistinct, posterior coxæ contiguous. Legs moderate. Anterior tibiæ obliquely grooved within at tip, outer edge slightly spinulose, the inner spur above the apex. Middle and posterior tibiæ spinulose externally, the spurs moderate in length. Tarsi moderate in length, the first joint not longer than the second.

In the specimen before me of *Migadops* (*Brachycælus*) *virescens* the anterior and middle tarsi of the male have four joints dilated and papillose beneath.

Through the great kindness of my friend Mr. H. W. Bates, I have been enabled to examine the specimen above indicated. I regret that I have been compelled to define the tribe in a somewhat incomplete manner but there will be no difficulty in assigning a place here to those genera whose affinities indicate it.

The tribe as defined by Chaudoir (Bull. Mosc. 1861, i, p. 510), is certainly composed of very dissimilar material and I have removed *Metrius* to form a distinct tribe the reasons for which will be found in the proper place.

The genera referred to this tribe by Chaudoir (omitting *Metrius*), are—*Antarctonomus*, *Brachycælus* and *Migadops* from Tierra del Fuego, *Monolobus* and *Rhytidognathus* from Chili, *Lissopterus* from Falkland Islands, and *Heterodactylus* from Auckland.

Monolobus is remarkable in having the outer maxillary lobe of one piece as in *Amphizoa*.

The tribe seems very naturally to lead from the Nebriini to the Metriini.

Migadops virescens Waterh., has considerable superficial resemblance to *Nebria virescens* Horn.

Tribe XI.—Metriini.

Antennæ moderate in length, straight, arising under a distinct frontal margin; first four joints glabrous, the first joint stouter but not longer than the third, 5—11 subequal, pubescent. Eyes small, round, distant beneath from the buccal opening. Head with a single setigerous puncture over the middle of each eye. Labrum short, feebly bisinuate. Mandibles short, concave on the outer side and with a distinct setigerous puncture. Mentum transverse broadest at middle, deeply emarginate and with a rather stout, bifid tooth, epilobes distinct, mental suture well marked. Ligula broad, obtuse and bisetose at tip, the paraglossæ distinct and adherent in their entire length; palpi rather stout, the last two joints of nearly equal length, the second bisetose in front, the third broader to apex and truncate. Maxillæ with inner lobe rather short, distinctly hooked at tip and ciliate internally, the outer lobe biarticulate and with equal joints; palpi rather stout, the terminal joint nearly as long as the second, gradually broader to tip and obtuse. Thorax transverse, a seta at point of greatest width another in front of the hind angles. Bases of thorax and elytra in close apposition, scutellum indistinct. Elytra not margined at base, moderately inflexed at the sides, the margin acute and entire. Anterior coxal cavities closed behind, prosternum slightly prolonged and partly covering the declivous and flat mesosternum. Femora moderately stout, the anterior scarcely thicker. Anterior tibiæ obliquely grooved and emarginate near the apex, both spurs terminal. Middle tibiæ ciliate externally. Posterior coxæ separated by a rather broad triangular process of the abdomen. Tarsi moderate, first joint longer than either of the three following, fourth not emarginate.

The first joint of the anterior tarsus of the male is rather broadly dilated and with the second densely spongy pubescent beneath.

The metasternal side pieces of which no mention is made above are sometimes simple, that is, with all trace of suture between the episternum and epimeron obliterated or the suture may be more or less distinct and the side pieces consequently double.

The genus *Metrius* is the only one known to me which finds a place in the present tribe. It is a very distinct type the affinities of which

are not easy to define. The posterior coxæ being separated a relationship seems to be indicated with the Promecognathini and Cychrini, especially with the latter by the more widely inflexed sides of the elytra but it differs widely from either by the structure of the anterior tibiæ. The presence of a setigerous puncture on the mandible is a very curious addition to the other characters, as I observe that this is in nearly if not quite all other cases associated with riparial habits which cannot from my observation be said of *Metrius*.

Chaudoir (Bull. Mosc. 1861, i, p. 510), places the present genus in his tribe Migadopidæ, and while but one other genus of that tribe is known to me I feel very safe in saying that the present can not be allowed to take place with it. In the synoptic table the structure of the metasternal side pieces is used for the separation of *Migadops* (*Brachycælus*) from *Metrius*. In the specimen of *Mig. virescens* before me the met-epimera are not distinct while in *Metrius* the suture is sometimes visible and in others not.

Tribe XII.—**Mystropomini.**

Antennæ arising under a slight frontal plate, four basal joints glabrous. Eyes small, round, not prominent, distant from the mouth beneath. Head oval, with two small supra-orbital setæ. Clypeus rather large with two small setigerous punctures each side. Labrum short, sinuate in front and plurisetose. Mandibles acute at tip, feebly arcuate, toothed at middle, no setigerous puncture externally. Maxillæ arcuate and acute at tip, spinulose and ciliate internally, outer lobe biarticulate, palpi rather stout, the terminal joint longer, flattened, broader externally with the tip rounded. Mentum large, deeply emarginate and with a large median emarginate tooth, ligula cuneiform suddenly broader in front, the tip slightly prolonged in front and sexsetose, paraglossæ rather broad, adherent in their entire length and obtuse at tip, the palpi stout, terminal joint as in the maxillary. Thorax without marginal setæ. Elytra not margined at base, (scutellum indistinct), sides rather widely inflexed, margin entire not interrupted. Prosternum obtuse at tip, not prolonged, anterior coxal cavities closed behind. Mesosternum narrowly separating the coxæ, the epimera indistinctly separated from the episterna but distinctly reaching the middle coxal cavities. Metasternal episterna short and broad, the epimera distinct, posterior coxæ separated. Legs moderate in length. Anterior tibiæ deeply obliquely grooved within the spurs both terminal. Middle tibiæ ciliate with short depressed hairs externally and within, the outer edge of posterior tibiæ not ciliate, the tibial spurs rather short. Tarsi slender, the first joint as long as the two following.

The tarsi are said by Chaudoir to be similar in the sexes.

For a specimen of *Mystropomus subcostatus* Chd., the only known member of the present tribe, I am indebted to Mr. H. W. Bates.

Of all the genera which I have studied this has caused me the greatest surprise from the position in which it is placed and which appears to be now accepted without question.

Mystropomus is now placed at the head of the tribe Ozænini by Chaudoir, but the reasons why it should not be placed there are very many. In the discussion of that tribe will be found the reasons for removing it from association with the true Carabinæ. The mesosternal epimera do not reach the middle coxal cavities as one can prove by softening the specimens in a solution of caustic potassa when the sutures become evident and mere plications of the surface obliterated.

In *Mystropomus* however we have a structure of body resembling very closely *Metrius* not only in the inflexed sides of the elytra but their general appearance. The epimera and episterna of both segments are likewise constructed on a similar plan and the posterior coxæ separated. On comparing the form of head and antennæ and even the mouth parts we have a striking analogy with *Metrius*. I am disposed to consider *Mystropomus* the closest ally in every respect with *Metrius* and with *Migadops* an intermediate link toward the Nebriini.

It is remarkable that this genus should occur in Australia. Lacordaire (Atlas pl. 5, fig. 5), gives an illustration of the species which might however be improved.

Tribe XIII.—Promecognathini.

Antennæ slightly geniculate, arising under a slight frontal margin, first four joints glabrous, the first much larger and stouter than the others, 5—11 slightly compressed and finely pubescent. Eyes small slightly oval and distant from the buccal opening. Head with two supra-orbital setæ, neck slightly broader behind the eyes. Labrum short, bisinuate. Mandibles elongate, arcuate and acute at tip and decussating, not toothed within. Mentum short, broad, broadly emarginate and with a broad short tooth, epilobes narrow but distinct, mental suture distinct. Gula deeply transversely impressed so that the mentum is inserted at a right angle to the peduncle. Ligula moderately prominent narrower and free at tip, truncate, with two setæ, paraglossæ long, rather slender and ciliate within at the tip. Maxillæ with inner lobe slender and long, obtuse at tip, densely ciliate within, outer lobe biarticulate the terminal joint much shorter. Maxillary palpi moderately long, the second joint equal to the next two together, terminal joint broader at tip truncate and twice the length of the third. Labial palpi with the last two joints about equal in length, the terminal broader at tip and truncate, the preceding bisetose in front. Thorax narrowed at base, sides narrowly inflexed, lateral margin distinct, a setigerous puncture near the hind angle and three at the side in front. Body pedunculate, scutellum invisible. Elytra not margined at base, lateral margin distinct and entire, sides narrowly inflexed. Anterior coxal cavities closed behind, prosternum not prolonged, mesosternum declivous. Metasternal epimera indistinct. Femora stout, the anterior more strongly clavate. Anterior tibiæ gradually broader to tip, smooth externally, deeply emarginate internally, the inner spur remote from the tip. Posterior coxæ separated by a triangular process of the abdomen which meets the metasternum. Tarsi moderate, the posterior longer, first joint moderately long, fourth slightly emarginate. Tarsi similar in the sexes.

The above characters which I have drawn entirely from our only representative should be somewhat modified by the omission of the descriptions of the palpi and other parts which may be considered purely generic. The description is rather detailed in order that the omissions in previous descriptions of *Promecognathus* may be supplied.

This tribe as typified by our genus has been the subject of some discussion and very diverse opinions have been expressed regarding its systematic position. From my own study I feel convinced that the views expressed by LeConte (Class. Col. N. A. p. 12), are correct.

As far as known to me two genera only belong to this tribe, as follows:

Last joint of maxillary palpi oblong-oval truncate.....**Promecognathus.**
Last joint of maxillary palpi strongly securiform.....**Axinidium.**

These two genera are placed by Lacordaire (Genera i, p. 247), in a tribe which owes its origin to Chaudoir, (Bull. Mosc. 1846, p. 511), composed as very justly observed by Schaum (Berl. Zeitschr. 1860, p. 178), of very dissimilar material, held together it may be added by a bond of the feeblest nature. The positions of the other genera will be discussed in their proper places and the correctness of Schaum's views shown except as to *Glyptus*, which has very little to do with the Orthogoniens but far more with the Harpalini.

As restricted above the tribe falls very naturally between the tribes which precede and the Scaritini.

Promecognathus occurs in California, *Axinidium* in western Africa.

Tribe XIV.—**Enceladini**

Antennæ moderate in length, straight, arising under a distinct frontal margin; first four joints glabrous, the first joint stouter suddenly narrowed at base, second equal in length, 3—11 gradually shorter and more slender. Eyes comparatively small, round and distant from the buccal fissure. Head with a single setigerous puncture over each eye. Labrum moderately prominent, arcuate at the sides and feebly emarginate at middle. Mandibles stout, arcuate, a large tooth near the base, outer side deeply grooved and without setigerous puncture. Maxillæ with inner lobe strongly hooked at tip and with short spinules on inner edge, outer lobe stout biarticulate, the palpi stout, second joint longer than the others, the terminal broad, oboval. Mentum large without distinct suture at base, broadly arcuate at the sides, deeply emarginate and with a moderate tooth emarginate at tip, epilobes distinct. Ligula prolonged in a broad obtuse point, bisetose, the paraglossæ corneous and closely united it; labial palpi moderate, the terminal joint somewhat triangular and arcuately truncate at tip. Thorax broad, a seta at the side another in front of hind angle. Body pedunculate, scutellum forming the larger space of the peduncle above. Elytra not margined at base, the lateral margin entire and very narrowly inflexed. Prosternum obtuse at tip, not prolonged, the coxal cavities closed behind. Mesosternum broad convex and oblique. Metasternal epimera indistinct, the posterior coxæ distinctly separated by a narrow

abdominal process. Femora moderate and nearly equal. Anterior tibiae gradually broader to tip, grooved on the inner side near the tip, the spurs nearly on the same line transversely. Tarsi moderate in length, the first joint longer, the fourth not emarginate.

The tarsi do not differ in the sexes.

As in the other tribes of the present sub-family which contain but one or two genera, the description of the present is made with considerable detail drawn entirely from the typical genus, the only one known to me in nature. In the books *Enceladus* is placed with *Siagona*, a genus with which it seems to have very little relation except the large mentum without suture at base. Schiöedte and Chaudoir have been deceived by a line of sculpture and have placed the Siagonides as a whole in the present sub-family. I do not find the mesosternal epimera attaining the coxæ in *Siagona* while they do very plainly in *Enceladus*. Another character used by Schiöedte is of very doubtful utility "*antennæ scrobiculis recipiendæ*," the antennal grooves or scrobes being merely the result of the dilated genal plates which are variable within generic limits, and have already been made use of by me in separating the species of *Cychrus* in subgeneric sections.

Not knowing *Luperca** in nature I am unable to say whether it enters the present tribe or not, should it be as closely allied to *Enceladus* as stated by Lacordaire the two genera form a very distinct type equal in value to the Metriini or Promecognathini and with its affinities but little better marked. Lacordaire perceives relationships with the Ozænides, Galeritides and Scaritides, but these entirely escape me except as to the last of these tribes, to which there is but little resemblance except in external form. I believe however it is better placed near the Scaritini than anywhere else in the series.

Enceladus occurs in Colombia and Guiana, *Luperca* in the East Indies.

Tribe XV. — Scaritini.

Antennæ moderate in length, inserted under a frontal plate with a variable number of glabrous joints. Eyes comparatively small very finely granulate and distant from the buccal opening (Scarites), or normally convex and granulate and not distant from the mouth (Clivinæ). Head variable in form and with one (Scarites) or two (Clivinæ) supra-orbital setæ. Labrum short, emarginate or sinuate. Mandibles at least moderately prominent, without setigerous puncture, simple or dentate. Maxillæ with the inner lobe often obtuse at tip, in some genera normally hooked, ciliate or spinulose within, outer lobe biarticulate the terminal joint usually shorter, palpi variable in form. Mentum emarginate, often deeply, the tooth variable in size, epilobes narrow, but very wide in *Schizogenius*.

* Chaudoir replaces this name by *Holoscelis* Chd. For other remarks which may properly be read as a supplement to the present tribe, the reader is referred to the Siagonini.

Ligula either broad and large (*Scarites*) or small and prolonged (*Clivinæ*) the tip narrow and bisetose, except in *Pasimachus* in which it is but little prominent at middle and with the two setæ very closely approximated, paraglossæ usually slender and longer than the ligula, spinulose within in the *Scarites*. Palpi moderate, terminal joint variable in form, shorter than the penultimate (*Scarites*) equal or longer (*Clivinæ*), the penultimate bisetose in front (*Clivinæ*) plurisetose (*Scarites*). Thorax variable in form, hind angles rarely prominent, side margin with a setigerous puncture in the hind angle (*Scarites*) or with two lateral punctures (*Clivinæ*). Body pedunculate, scutellum not visible between the elytra. Elytra rarely slightly margined at base, sides narrowly inflexed margin entire except in *Ardistomis* where there is a distinct interruption posteriorly and an internal plica. Prosternum not prolonged behind the coxæ, the cavities closed behind. Mesosternum vertical, not carinate in front. Metasternal epimera not visible in *Pasimachus*, more or less distinct in all the other genera. Posterior coxæ contiguous. Legs stout more or less fossorial, the anterior femora especially stout. Middle and posterior tibiæ ciliate or spinulose externally but often very finely, anterior tibiæ palmate the outer apical angle prolonged, inner side deeply emarginate with the inner spur above the emargination. Tarsi slender.

From the above characters it is evident that the tribe must be subdivided into two groups in the following manner:

Basal joint of antennæ long. Mentum broad, concealing at the sides the base of the maxillæ. Head with one supra-orbital setigerous puncture, thorax with one setigerous puncture at the hind angle.....	SCARITES.
Basal joint of antennæ not elongated. Base of maxillæ not covered by the mentum. Head with two supra-orbital setigerous punctures, sides of thorax with two.....	CLIVINÆ.

In addition to the above characters the form of the labial palpi and the paraglossæ give additional means of separating the groups.

The sexual characters of the genera of this tribe are very feeble. In *Scarites* the last ventral segment has four marginal punctures, in the female the inner two are more distant from each other than from the outer, while in the male they are equidistant. In *Pasimachus* some species have the posterior tibiæ pubescent within at tip in the male. There are no marginal punctures on the last ventral segment, in the males there will usually be observed on each side one ante-apical puncture and in the females two, but these are not constant in any respect.

In the *Clivinæ* the last segment is the same as in *Scarites*, the tarsi are often alike slender in both sexes but when dilated are more so in the male. In *Dyschirius* the palpi differ as will be seen below.

The antennæ vary in the number of glabrous basal joints, the *Scarites* have four and the *Clivinæ* two. In *Aspidoglossa* the base of third is glabrous but even here as in all the *Clivinæ* the second joint though not pubescent is hairy.

Group SCARITES.

In our fauna two genera occur separated in the following manner:

- Hind angles of thorax distinct. Elytra with humeral carina of variable length.
 Maxillæ very obtuse at tip.....**Pasimachus.**
 Hind angles of thorax wanting. Elytra without humeral carina. Maxillæ slightly
 hooked at tip.....**Scarites.**

In these two genera the four basal joints are glabrous and in repose the scape is received in a depression beneath the eye.

Group CLIVINÆ.

The genera which occur with us are as follows:

- Margin of elytra entire. Mandibles flat and arcuate.
 Anterior tarsi slender in both sexes.
 Palpi dissimilar in the sexes, the terminal joint more dilated in the male,
 excavate beneath with a large sensitive space. Thorax globose or globose-
 oval.....**Dyschirius.**
 Palpi similar in the sexes, not dilated nor excavated in the male. Thorax
 more or less quadrate.....**Clivina.**
 Anterior tarsi more or less dilated in both sexes.
 Mentum feebly emarginate. Head not grooved.....**Aspidoglossa.**
 Mentum deeply emarginate. Head with numerous longitudinal grooves.
Schizogenius.
 Margin of elytra interrupted posteriorly and with an internal plica. Mandibles
 slender, prolonged not arcuate. Anterior tarsi of both sexes rather
 widely dilated.....**Ardistomis.**

In the arrangement of the genera of this group I regret that I am unable to follow my friend M. Jules Putzeys, nor can I from my dissections find the ligular characters which he aims to illustrate in his Postscriptum (Mem. Liege xviii, 1863). The dissection of the species of this group is by no means an easy task, and the difficulties attendant on its accomplishment must be the cause of the entire absence of resemblance between the drawings of M. Putzeys and the objects themselves.

In all our genera the ligula is small and is usually hidden by the supports of the labial palpi. The ligula is slender, the tip more or less acute, free and bisetigerous the paraglossæ slender and acute, not longer than it. The form of the maxillæ, mentum, ligula and palpi, are shown in the accompanying figures and need no further description. *Clivina* and *Dyschirius* are best separated by the form of the palpi, all other characters heretofore given fail in our series of species.

As arranged in the preceding table our genera show the transition from the simple form of inner maxillary lobe of *Pasimachus* to that which is the more common form in all Carabidæ.

It is curious in this tribe that *Ardistomis* should have the elytral margin interrupted with an internal plica. It thus shows considerable more affinity with the Harpalinæ than do the other genera and seems to be the nearest Carabine relation of the Panagæini, in place of the Cychrini as suggested by most authors.

Sub-Family *HARPALINÆ*.

Middle coxal cavities entirely enclosed by the central pieces of the meso- and metasternum, the epimera not attaining the coxæ. Head with setigerous punctures over the eyes. Thorax with setigerous punctures at the side and posterior angle very rarely without the latter and still more rarely without either. Anterior tibiæ always either obliquely sinuate or deeply emarginate within, the inner spur remote from the apex.

These characters seem to be the only ones in which all the tribes agree. As there are many points in which wide differences occur these will be left for discussion in their proper places.

For convenience of study the sub-family may be divided in two grand sections.

Head with two supra-orbital setigerous punctures.

HARPALINÆ BISETOSÆ.

Head with one supra-orbital setigerous puncture.

HARPALINÆ UNISETOSÆ.

Small as this character may seem it is probably one of the most invariable of any that have been suggested for the division of any large series of genera or tribes. I have never observed an exception, although Bedel* says that in two European *Amara* one has but one supra-orbital seta (*spectabilis*) and the second (*pyrenæa*) none whatever.

When two setæ occur the anterior is close to the margin of the eye in front, the posterior is a little remote from the eye opposite the posterior margin. When there is one seta it is almost always a little removed from the margin of the eye and is situated opposite the middle of the eye or a little posterior to that point.

The Harpalinæ as here constituted seem to be the true development of what might be called the Carabide idea of the present geological period. There is evidently a close relationship in the entire series with fewer breaks in the line of affinity and with very few genera that are abnormal or specially differentiated in the sense in which we observe

* Ann. Fr., 1879, suppl. p. 52, note.

it in the Carabinæ. It will be observed in glancing over the series of tribes and genera that there are three well marked types, *Pterostichus*, *Lebia* and *Harpalus*, closely related among themselves around which we may group other types either more or less intermediate between the three or related to them as a centre and from thence diverging with no definite affinity. It is therefore impossible to construct any linear arrangement which will exhibit all the evident relationship without at the same time interrupting other equally evident affinities.

The tribes which follow are so placed that those which seem to exhibit the closest relationship with the Carabinæ are at the beginning with those following which seem to lead to the true Harpaline type.

Those with the two supra-orbital setæ will be considered first and for convenience of reference will be called by the following name.

HARPALINÆ BISETOSÆ.

This section contains by far the larger number of tribes and genera and presents many difficulties in its study. Many of the characters used in the table are the common property of science others are new or have been brought into greater prominence for the first time here. To those acquainted with the literature of the subject no special references are needed.

As in the Carabinæ it appears to have escaped notice that a number of genera have the posterior coxæ separated and the metasternum and abdomen meeting. This is an important character and its use is attended with good results.

The internal elytral plica by its presence serves to separate a number of tribes. The object of this structure is to afford a means of support to the edge of the abdomen and at the origin of the plica posteriorly the last ventral segment is firmly held when in repose. It will be observed that in those genera with a plica the upper edges of the ventral segments are vertical, those without the plica have the edge inflexed. As a rule the pliciferous genera are terrestrial and are at best feeble flyers, the majority of the others are easy flyers and less terrestrial in their habits. This however is merely a general statement with many exceptions on both sides.

The tribe *Panagæini* is placed at the head in the belief that some of its members will show a closer relationship with the *Clivinæ* than has yet been indicated.

The table which follows is the result of a study not only of the genera of our fauna but of all which were accessible, the cabinets of the Academy of Natural Sciences, supplemented by that of our own

Society have afforded an amount of material which had never been properly estimated. Many of the genera will be found mentioned in the following pages, but only those which seemed to require it and which are but a part of those actually studied.

Those who know the extent of the subject will properly estimate the amount of labor expended and with the hope that the table will prove an incentive to additional work with many improvements and emendations, it is presented for the consideration of those interested.

Mandibles with a setigerous puncture in the groove (scrobe) on the outer side.

Antennæ slender with at most two basal joints glabrous. The abdominal segments entirely corneous.

Last joint of palpi subulate. Mesosternal epimera wide.

Tribe XXII. **Bembidiini.**

Last joint of palpi slender—elongate or subcylindrical. Mesosternal epimera narrow.....Tribe XXIII. **Pogonini.**

Antennæ moniliform or slightly compressed externally, four basal joints glabrous. (The abdominal segments 3—4—5 narrowly coriaceous on their posterior margins in *Nomius*).....Tribe XIX. **Nomiini.**

Mandibles without setigerous puncture in the scrobe.

Posterior coxæ separated, the first ventral segment visible between them. Thorax with setigerous puncture in the hind angle.

Suture at base of mentum distinct; margin of elytra interrupted posteriorly. Middle coxæ closely approximated or contiguous.

Tribe XVIII. **Ozæniini.**

Suture at base of mentum entirely obliterated; margin of elytra not interrupted and without internal plica. Middle coxæ distant.

Tribe XVII. **Siagonini.**

Posterior coxæ contiguous, (except in *Egini*.)*

A.—Margin of elytra interrupted at posterior third and with a distinct internal plica.

Four basal joints of antennæ glabrous, antennæ moniliform or slightly compressed.

Mesosternal epimera broad; anterior tibiæ not dilated; segments 3—4—5 of abdomen coriaceous posteriorly. Body not pedunculate.

Tribe XX. **Psydrini.**

Mesosternal epimera narrow; anterior tibiæ dilated; abdomen entirely corneous. Body pedunculate.....Tribe XXI. **Morionini.**

Three basal joints of antennæ or less glabrous.

Head more or less constricted behind the eyes and dilated to a semi-globular neck. Terminal joint of maxillary palpi arising obliquely from the preceding joint.....Tribe XVI. **Panagæini.**

Head not constricted behind the eyes. Terminal joint of the maxillary palpi arising normally from the end of the preceding joint.

Tribe XXIV. **Pterostichini.**

* The *Egini* can not be confounded with either of the two preceding tribes from the other special characters which they possess.

- B.**—Margin of elytra not interrupted posteriorly, without internal plica.
 Front short, labrum impressed.....Tribe XXV. **Licinini**.
 Front normal.
 Penultimate joint of labial palpi bisetose.
 Posterior coxæ separated.....Tribe XXXIII. **Egini**.
 Posterior coxæ contiguous.
 Head elongate, prolonged behind the eyes, neck constricted and dilated
 behind in a semiglobular condyle.
 Elytra entire.....Tribe XXVIII. **Ctenodactylini**.
 Elytra truncate.
 Terminal joints of palpi similar, cylindrical or slightly oval.
 Three basal joints of antennæ glabrous. Ungues simple.
 Tribe XXIX. **Odacanthini**.
 Four basal joints glabrous; elytra explanate. Ungues simple.
 Tribe XXXI. **Mormolycini**.
 Terminal joints of palpi dissimilar, the labial triangular the maxillary
 cylindrical. Thorax feebly margined at sides.
 Tribe XXXII. **Agrini**.
 Head not prolonged behind the eyes, neck not semiglobose.
 Elytra rounded at tip. Ungues simple...Tribe XXVII. **Anchonoderini**.
 Elytra obliquely sinuate. Ungues simple or feebly pectinate.
 Tribe XXVI. **Platynini**.
 Elytra truncate at tip.
 Thorax with distinct lateral and basal setigerous punctures.
 Anterior tibiæ slender. Paraglossæ membranous.
 Tribe XXXIV. **Lebiini**.
 Anterior tibiæ rather stout, gradually broader to tip. Paraglossæ
 corneous.....Tribe XXXV. **Helluonini**.
 Thorax without lateral or basal setæ.
 Tibiæ carinulate and serrulate externally.
 Tribe XXXIX. **Orthogonini**.
 Tibiæ with the outer edge rounded....Tribe XXXVIII. **Cratocerini**.
 Penultimate joint of labial palpi plurisetose in front and always longer
 than the terminal joint.
 Eyes normal, their lower margin very close to the buccal opening. First
 antennal joint elongate.....Tribe XXX. **Dryptini**.
 Eyes large, prominent, distant beneath from the mouth. First antennal
 joint not elongate.
 Tibial spurs rather short.....Tribe XXXVII. **Anthiini**.
 Tibial spurs long, those of the posterior tibiæ dissimilar.
 Tribe XXXVI. **Graphipterini**.

The preceding table contains twenty-four tribes of which seventeen have representation in our fauna. There is no tribe peculiar to our fauna. Those not represented are Siagonini, Mormolycini, Agrini, Orthogonini, Cratocerini, Anthiini and Graphipterini. The third and fifth being the only ones with representation in our Hemisphere and these so far from our limits that it is not likely they will ever be found with us.

Tribe XVI.—**Panagæini.**

Antennæ slender arising under a distinct frontal ridge, three basal joints glabrous, without fine punctuation and pubescence, but ciliate. Head usually constricted behind the eyes and dilated to a semiglobular neck, front with two supra-orbital setæ. Eyes round, rather prominent, distant beneath from the buccal opening. Labrum with four setæ only. Maxillæ small the inner lobe slender, hooked at tip ciliate or spinous within, outer lobe stout, biarticulate, palpi elongate the last joint triangularly dilated and inserted obliquely on the preceding, these two hairy. Mentum emarginate, toothed at bottom, the basal suture distinct. Ligula moderately prominent, bisetose at tip the paraglossæ adherent and rarely longer than it, palpi moderate in length the terminal joint triangular. Thorax variable in form. Body not pedunculate, scutellum distinct. Elytra not margined at base, sides narrowly inflexed, margin interrupted posteriorly and with an internal plica. Prosternum not prolonged. Mesosternum oblique, the epimera very narrow. Metasternal epimera distinct, posterior coxæ contiguous. Tibiæ ciliate externally, the anterior emarginate within, the spurs distant. Tarsi slender in our genera, the fourth joint bilobed in certain exotic genera.

The males rarely have the anterior tarsi dilated. In our genera the first two joints of the anterior tarsi are dilated and hairy beneath.

Of late years authors seem pretty well in accord as to the limits of this tribe. Lacordaire included *Loricera* which has already been discussed. To the tribe as left by the latter author Schaum (Ins. Deutschl. i, p. 318), added *Tefflus*, and *Disphæricus* which however is not included by Chaudoir in his essay on the tribe (Ann. Belg. 1878). I have not seen the latter genus in nature. *Geobius* included by Lacordaire is excluded by Chaudoir for reasons which seem scarcely more than of generic value. I cannot see any relation with *Pelecium*.

Chaudoir in the characters of the tribe has the following paragraph:

“Mâchoires crochues et très ciliées en dedans, lobe inférieur à *dernier article* court, *très large*, comprimé et terminé par un petit crochet (excepté dans le genre *Micrixys*).”

I can find no such character as that mentioned for the outer maxillary lobe and if it did exist would be unique in the tribe and extraordinary in the entire family.

The affinities of the tribe are not well marked in any direction, it appears in fact to stand more nearly alone than any tribe of the present sub-family, and I have already expressed the opinion that its affinities with the Carabinæ are rather through the Clivinæ than the Cythrini. I can see no reason for suspecting any relationship with the Chlæniini.*

Two genera occur in our fauna which differ in the following manner:

Clypeus prolonged beyond the base of the mandibles, the latter decussating, scissor-like.....**Panagæus.**
Clypeus emarginate at middle, the mandibles stout, pincer-like.....**Micrixys.**

The latter genus has the head not distinctly constricted but the neck is of the same semi-globular form as in the former.

In both genera the ocellate punctures which are usually observed near the margin of the elytra in Carabidæ are absent, but are present in other genera of the tribe. I have observed also that they are absent in *Apotomus*, a genus not related to the present tribe.

Tribe XVII.—*Siagonini*.

Antennæ slender, arising under a distinct frontal plate, first joint elongate conical pilose, second short glabrous at base, 3—11 equal and, with the apex of the second, pubescent. Clypeus prolonged at middle. Head depressed, quadrate, two approximated supra-orbital setæ. Eyes small oval, truncate posteriorly, very distant beneath from the buccal fissure. Labrum sinuate or denticulate. Mandibles strongly arcuate, either dentate or simple within, scarcely concave externally without setigerous puncture. Maxillæ ciliate within, the outer lobe with terminal joint longer, palpi stout, the joints with short hairs, the terminal shorter than the preceding, oval, truncate at tip. Mentum large almost entirely concealing the maxillæ, the suture at base indistinct, deeply emarginate and with a large bifid tooth, ligula large prominent, slightly emarginate in front and plurisetose, the paraglossæ corneous and closely united with it, palpi moderate, last joint securiform. Thorax narrowed at base, grooved above and with a setigerous puncture on the hind angle and others along the side margin. Body pedunculate. Elytra elongate-oval, depressed, sides narrowly inflexed, margin entire, base not margined. Prosternum not prolonged. Mesosternum rather widely separating the coxæ, horizontal, the epimera narrow and not attaining the coxal cavity. Metasternal epimera small but distinct. Posterior coxæ slightly separated, the first ventral segment distinct between them. Anterior tibiæ emarginate within and deeply obliquely grooved, the inner spur superior. Tarsi simple in the two sexes.

This group contains but one genus *Siagona* (possibly also *Luperca* = *Holoscelis*), not represented in our fauna. It has been made by most authors the type of a tribe and placed in the Carabinæ. The Siagonides of European authors contains two very dissimilar elements. *Enceladus* and *Luperca* (?) having the middle coxæ partially closed externally by the mesosternal epimera form in the present essay the tribe Enceladini of the sub-family Carabinæ. *Siagona* on the other hand has the mesosternal structure of the present sub-family and Schioedte, Schaum and Chaudoir have been deceived by a mere plication in the mesosternal side pieces and have been lead to believe that the mesosternal epimera reach the coxæ. By macerating a specimen of *Siagona* for a sufficient time in a solution of caustic potassa the sutures become apparent and will be found as stated above.

The latest review of the Siagonini is that published by Baron Chaudoir (Bull. Mosc. 1876), in which *Enceladus* still retains its place in the tribe. In recognizing the great value of the discovery (which we owe to Dr. LeConte), of the difference in form of the mesosternal epimera in the sub-families of Carabidæ, Chaudoir states that in associating *Siagona* with *Enceladus* one reasons rather by analogy as the suture which sepa-

rates the epimera is so obsolete as not to be distinguished. It is to be regretted that so able an entomologist should have allowed himself to perpetuate an error when the truth was so nearly within his grasp and so easily obtained, and had the above mentioned process (so well known to microscopists) been made use of, more service would have been done to science than by many ligular dissections.

If I have correctly interpreted the feeble traces of the suture at the base of the mentum this organ is not attached merely to the central gular piece but also to the side pieces of the gula, in a manner similar to that observed in the Pseudomorphinæ. In all other Carabidæ which I have dissected the central gular piece is expanded at tip and forms the entire basal attachment of the mentum even in those genera with a very broad mentum.

With a very indefinite relationship with the Pseudomorphinæ the present tribe shows very decided affinities with the Ozænini.

Tribe XVIII.—Ozænini.

Antennæ arising under distinct frontal plates, the four basal joints not finely pubescent but hairy. Clypeus prolonged at middle. Head more or less narrowed behind the eyes to a neck and with at least two supra-orbital setæ. Eyes round, moderately prominent, irregular in outline behind, distant from the buccal opening beneath by the moderately widened genæ. Mentum broad, the suture at base usually very plainly visible, toothed (except *Eustra*), ligula moderate or small, the paraglossæ narrow and entirely adherent, the palpi variable in form, the terminal joint usually cylindrical, flattened and truncate at tip, the maxillary palpi similar. Thorax with numerous small setigerous punctures along the margin. Body more or less pedunculate. Scutellum not prolonged between the elytra. Elytra not margined at base, narrowly inflexed at the sides, margin interrupted one-third from apex but without internal plica. Prosternum not prolonged at tip. Mesosternum very narrow, in some cases not separating the middle coxæ. Mesosternal epimera broad, not attaining the middle coxæ. Metasternal epimera visible. Posterior coxæ distant, the first ventral segment visible between them. Anterior tibiæ emarginate on the inner side the spurs distant. Tarsi slender, simple in the two sexes.

The sexual characters are feeble, the males sometimes having the anterior femora toothed beneath.

By all European authors this tribe has been placed in the series in which the mesosternal epimera attain the coxal cavities. The idea originated with Schiœdte, has been adopted by Schaum and acknowledged by Chaudoir.

The latter gentleman with his usual sagacity realizes the impropriety of such a position of the tribe and uses the following language (Ozénides, Ann. Belg. xi, 1868, p. 3), in reference to the epimeral character: "un caractère auquel Schiœdte et après lui beaucoup d'entomologistes ont pendant quelque temps attaché une importance que je trouve maintenant exagérée."

After a careful examination of *Physeia* and *Pachyteles* I find that the mesosternal epimera do not attain the middle coxæ, and that no better evidence is required of the value of the character than the fact that these genera and their allies are thereby excluded from the Carabinae.

The value of the character drawn from the mesosternum is certainly very much overestimated, as it will be observed that while certain species of *Pachyteles* (*marginicollis*, *biguttatus*), have the middle coxæ as distinctly separated as in many *Platynus*, others have the middle coxal cavities confluent (*mexicanus*). It will be observed however that there is an unusual degree of flexibility of the central region of the body and that the articulation between the meso- and metathorax is rather loose. The lateral process of the central piece of the mesosternum, that is, those processes which partly enclose the coxæ externally, are capable of a slight motion under the opposite processes of the metasternum and the limit of this motion is indicated by a slight ridge on the former process, which ridge is exactly continuous with the suture separating the mes-episternum from the mes-epimeron and has been the unfortunate cause of the deception of all those who have heretofore studied these parts. For those who desire to verify the above statements a preparation made in the manner indicated for *Siagona* will remove all doubts.

The interruption of the lateral margin of the elytra is a character entirely different from that observed in the succeeding tribes. If the margin is followed from the apex to the interruption it will be observed that this end passes *over* that which is formed by the anterior portion, while in the Pterostichini, etc., the posterior end passes *under* the anterior and is continued on the under side of the elytron in a long ridge.

The relationships of the Ozaenini are feeble in the direction of *Pseudomorpha* and *Siagona*, but more decided toward *Nomius* and *Psydrus* which lead through the Morionini to the central mass of the Harpaline series.

Mystropomus placed here by Chaudoir seems to me to be a true Carabine allied to *Metrius*.

One genus is represented in our fauna, and the species *Pachyteles testaceus* Horn, occurs in Arizona. *Physeia* has occurred at Tampico, Mexico, and may possibly be found in Texas.

Tribe XIX.—*Nomiini*.

Antennæ somewhat moniliform, arising under a distinct frontal ridge, four basal joints glabrous, first joint stouter not long, third nearly as long as the two following, terminal oval acuminate. Head stout, oval, neck broad, front with two supra-orbital setæ, clypeus slightly prolonged. Eyes round, prominent, free posteriorly, closely approaching the buccal opening beneath. Labrum short, broadly

emarginate. Mandibles slightly prominent, arcuate, acute at tip, inner edge feebly toothed at middle, outer lower edge slightly expanded, the outer face concave and with a distinct setigerous puncture. Maxillæ stout, with a double row of short stiff spines within, palpi stout, terminal joint slightly fusiform and obtuse at tip. Mentum broad, deeply emarginate without tooth, basal suture distinct. Ligula short, broad, acute and bisetose at tip, the paraglossæ slender slightly longer than it and ciliate within at tip, palpi short, last joint slightly fusiform, obtuse at tip. Thorax with two setæ near the front angles and one at the posterior. Body pedunculate, scutellum not visible between the elytra. Elytra slightly margined at base near the hind angles, sides very narrowly inflexed, margin slightly interrupted posteriorly and with a short internal plica, no dorsal punctures. Prosternum obtuse, not prolonged at tip. Mesosternum oblique the coxæ separated, epimera and episterna nearly equal. Posterior coxæ contiguous. Abdomen with posterior margins of segments 3—4—5 narrowly coriaceous. Legs moderate, middle and posterior tibiæ ciliate externally, the anterior slightly broader at tip, emarginate within, the spurs distant. Tarsi not dilated. Sexual characters as in *Scarites*.

As far as I can ascertain this tribe is represented by a single genus *Nomius*, (*Haplochile* Lec.), the position of which has been the cause of differences of opinion. For Dejean, Duval and Schaum it was a Morionide, Lacordaire (not knowing *Haplochile*), places *Nomius* in the Ozénides and *Haplochile* in Morionides. Chaudoir properly omits it from his essay on the Ozénides, while Bedel (Ann. Fr. 1879, suppl. pp. 24 and 42), places it in his tribe Bembidiini which is part of a very heterogeneous and impossible sub-family Bembidiidæ. Under *Psydrus* will be found its history in our fauna.

From the Morionini it differs in the form of the anterior tibiæ and mesosternal epimera and the presence of a mandibular setigerous puncture, the form of the ligula and paraglossæ and the structure of the abdomen.

The mesosternum is not narrow between the coxæ but emarginate, receiving the metasternum and in this respect differs greatly from the Ozæniini which have the mesosternum, at most, linear between the coxæ and never wide enough at tip to be emarginate.

I cannot understand why Bedel is willing to place *Nomius* near *Bembidium*, *Patrobus*, etc., the only point in which it resembles these is in the presence of mandibular seta. Its affinities seem to me to be best indicated by placing it between the Ozæniini and the Morionini.

Nomius contains but one species *N. pygmæus* Dej., which occurs in various parts of southern Europe, and in many places in our country from Georgia to California.

It occurs under stones, etc., in moist places, and exhales a strong fetid odor.

To this tribe two anomalous foreign genera should be referred *Melænus*

and *Coscinia*. These with *Nomius* seem to represent three groups in the tribe. *Coscinia* has very little relationship with *Siagona* except a slight resemblance in aspect. All the genera of this tribe as thus defined have a well marked elytral plica internally, a character sufficiently restricted in its distribution to indicate more or less approximately the relationship of genera possessing it.

For the privilege of examining these genera I am indebted to Mr. H. W. Bates.

Tribe XX.—*Psydrini*.

Antennæ moderate arising under a distinct frontal ridge, first joint moderately stout, cylindrical, third longer than second, the three basal joints and the base of fourth glabrous, 4—10 elongate-ovate, eleventh nearly as long as the two preceding. Head triangular, moderately constricted behind the eyes forming a broad neck, front with two supra-orbital setigerous punctures the posterior distant from the margin of the eye, epistome slightly prolonged. Eyes oval, slightly truncate behind, distant beneath from the buccal opening. Labrum short, slightly emarginate. Mandibles moderately prominent, arcuate, acute at tip, inner margin with a small tooth at middle, outer edge concave and without setigerous puncture. Maxillæ spinous within, the palpi moderate, the last joint longer than the preceding. Mentum broad, lateral lobes rounded, deeply emarginate and with a short, broad, bifid tooth, the mental suture distinct. Ligula short and broad, truncate and sexsetose at tip, the paraglossæ semicorneous adherent in all their length and not longer than the ligula, the palpi rather short, last two joints equal, the terminal somewhat fusiform and truncate at tip. Thorax trapezoidal, sides with three setigerous punctures, one at each angle and one slightly in front of middle. Body not pedunculate, scutellum distinct between the elytra. Elytra slightly margined at base near the humeri, sides narrowly inflexed, lateral margin slightly interrupted posteriorly and with a short internal plica, disc punctato-striate, two dorsal punctures on the third interval adjacent to the third stria, one-fourth from base and one-fourth from apex. Prosternum not prolonged. Mesosternum nearly flat, the middle coxæ distant, epimera wide nearly equalling the episterna. Metasternal epimera distinct, posterior coxæ contiguous. Ventral segments 3—4—5 with posterior margins coriaceous. Legs moderate, the tibiæ smooth externally, the anterior emarginate within, the spurs distant.

The anterior tarsi do not differ in the sexes, the sexual characters are the same as in *Scarites*.

The only genus known to me which can be referred to this tribe is *Psydrus*. Its form is not unlike some *Bembidia*, the color piceous.

Regretting the multiplication of tribes, I can find no place in which the genus can be put and am compelled to adopt the present course and consider it the type of a tribe the affinities of which are in the direction of *Nomius* and *Siagona*, as well as in a less marked degree toward *Morio*.

Psydrus was originally placed near *Ozæna*, (Ann. Lyc. iv, p. 153), subsequently with *Haplochile* (= *Nomius*), as a group of the tribe Broscini, a position retained in the Class. Col. N. Am. p. 30, Lacordaire in the meantime placing it in the Morionini. None of these positions

seem to me tenable, Ozænini having the posterior coxæ separated, *Nomius* the body pedunculate and a mandibular seta, *Morio* the anterior tibiæ dilated and body pedunculate. If we take the ligula as a point of comparison the resemblance is rather with *Pachyteles* (which however, has but two setæ or *Siagona* where there are six) than with *Morio* and *Nomius* where the paraglossæ are long and slender.

The body is not at all pedunculate and there are two supra-orbital setæ, characters which perfectly exclude it from all association with Broscini. There can be no suspicion of association with Pterostichini from the differences in tarsal and antennal structure.

There is then no course left but to consider it a distinct tribe leading directly from the Siagonini, Ozænini and Nomiini through *Morio* to the Pterostichini.

One species of *Psydrus* is known (*P. piceus* Lec.), which occurs from Lake Superior to northern California. I found it in the latter region living under dead bark, it ejects a liquid from its anus when disturbed which is not, like in *Nomius*, especially offensive.

Tribe XXI.—**Morionini.**

Antennæ more or less moniliform with four entirely glabrous joints, arising under slight frontal plates. Head suddenly narrowed behind the eyes, neck stout, front with two supra-orbital setæ, clypeus slightly prolonged. Eyes round, moderately prominent, truncate posteriorly by the sides of the head, distant beneath from the buccal opening. Mandibles at least slightly prominent without setigerous puncture externally. Maxillæ ciliate internally (with a tooth behind the apex in *Morio*); the palpi moderate, the last joint slightly fusiform. Mentum deeply emarginate, usually with a bifid tooth; ligula broad, free and bisetose at apex, the paraglossæ slender, longer than it, not ciliate; palpi moderate the last joint cylindrical (longer than that of the maxillary *Morio*). Thorax with a setigerous puncture at each angle (and three at the side *Morio*): Body slightly pedunculate, scutellum distinct. Elytra feebly margined at base, sides narrowly inflexed, disc with a single dorsal puncture at apical third, on the third interval near the third stria, margin with a very feeble interruption but with a distinct internal plica. Prosternum not prolonged. Mesosternum rounded in front, the epimera very narrow. Metasternal side pieces narrow, the epimera distinct, posterior coxæ contiguous. Ventral segments without coriaceous margin. Tibiæ gradually broader to apex, the middle finely spinulose externally, the anterior more dilated, the apical angle somewhat prolonged, inner side deeply emarginate, the inner spur above the emargination.

The first three joints of the anterior tarsi are slightly dilated in the male.

The remarks which have been made on the preceding tribes and their relationship with the present, sufficiently explain the views intended in the present paper. As constituted by Lacordaire (Genera i, p. 180), the tribe is a mixture of very dissimilar material. *Psydrus* and *Nomius* are already excluded. Schaum (Berl. Zeitschr. 1860, p. 177), suggests the

exclusion of *Physocrotaphus* and its union with the Helluonini in which position it appears in the Munich Catalogue. From the figures and description it seems to me probable that this also is incorrect, while the details already known to me seem clearly to indicate its affinities, but not knowing the insect in nature it seems unnecessary to venture farther.

Those genera without neck to the head should, in great part, if not all be excluded, especially those with truncate elytra (see remarks on *Basolia*, etc., in Cratocerini). This tribe is represented in our fauna by *Morio monilicornis* Latr., a shining black insect of moderate size, resembling somewhat *Pterostichus*. It occurs in the Southern States and is found under bark.

Tribe XXII.—*Bembidiini*.

Antennæ slender, arising under a slight frontal margin, the first two or often the first only glabrous, third joint sometimes not longer than the second. Head rarely narrowed behind the eyes to a neck (*Thalassobius*), with two supra-orbital setæ. Eyes round prominent, very narrowly separated beneath from the mouth (absent in *Anillus* and *Scotodipnus*). Clypeus usually moderately prolonged and with an erect seta on each side. Labrum transverse, sexsetose in front, rarely quite small (certain *Bembidia*). Mandibles feebly arcuate, acute at tip and with a setigerous puncture externally. Maxillæ slender, hooked at tip, ciliate or slightly spinulose within, the outer lobe slender and biarticulate or with the two joints united (*Amerizus*), the palpi moderate in length, the last joint usually small, subulate, sometimes conical, the penultimate club-shaped and pubescent. Mentum with basal suture distinct, variably emarginate, toothed, the tooth simple or notched, the ligula broader in front, free and truncate at tip and bisetose, the setæ usually very closely approximated, the paraglossæ slender, longer than the ligula and not ciliate within, the palpi moderate in length, the terminal joint small, subulate, the penultimate more or less club-shaped and bisetose in front. Thorax with a setigerous puncture at the side and at the hind angle. Elytra sometimes margined at base, sides narrowly inflexed, the margin interrupted posteriorly and with a distinct internal plica, disc with dorsal punctures or foveæ. Prosternum not prolonged. Mesosternum moderately separating the coxæ, the epimera moderately broad and wider externally. Metasternal epimera distinct, posterior coxæ contiguous. Legs moderate, the middle and posterior tibiæ slightly ciliate externally, the anterior deeply emarginate within and sometimes with the outer apical angle obliquely truncate (certain *Tachys*). Tarsi slender, claws simple, rarely serrulate (*Elaphropus*). Surface usually glabrous, pubescent in (*Tachypus*).

The males have usually two joints of the anterior tarsi dilated and squamulose or pilose (*Tachypus*) beneath, but in some *Tachys* the tarsi are similar in the sexes.

This tribe is about as well defined as any in the Carabidæ, the form of the last joint of the palpi being peculiar to it and giving the name by which it is often known, *Subulipalpi*.

It is remarkable that, in a tribe so remote from *Callistus*, the form of the outer lobe of the maxilla in that genus should be here repeated. It must however be especially remarked, that there is in *Amerizus* no

such complete fusion of the two pieces as in *Callistus* where the suture is not at all visible. In the former genus the suture is plainly evident if the under side is examined and not visible on the upper as shown in figure 38.

The serrate claws of *Elaphropus* Motsch., is a very singular character to occur in the present tribe, that it does occur I have assured myself by the examination of a specimen which I owe to the liberality of Dr. Dohrn. The species of this genus resemble *Tachys* and notably *incurvus*, etc.

The genera known to occur in our fauna are as follows :

Anterior tibiæ not obliquely truncate at apex. Sutural stria not recurved at apex.

Eyes large or moderate.

Elytra punctured without striæ, surface finely pubescent.....**Tachypus.**

Elytra striate or striato-punctate, glabrous.....**Bembidium.**

Eyes entirely wanting.....**Anillus.**

Anterior tibiæ obliquely truncate at apex. Sutural stria recurved at apex.

Elytra with the eighth stria interrupted or less deep at middle.....**Tachys.**

Elytra with the eighth stria very deep.....**Pericompsus.**

With *Bembidium* I include *Lymnæum* and also for the present *Amerizus* Chaud. (Rev. Mag. Zool. 1868). The latter genus was founded on *Trechus spectabilis* Mann., from the peculiar structure of the outer maxillary lobe. Beneath his generic description Chaudoir takes occasion to refer *Trechus oblongulus* Mann., to the genus *Lymnæum* as an aberrant species. On dissection I find the outer maxillary lobe probably more completely consolidated than in the true *Amerizus*. Rather than recognize a genus with two so dissimilar species I think it better to ignore the character and refer both to *Bembidium* where each will find better associates. It is well known that the mouth parts in *Bembidium* vary otherwise to an extent which would be considered generic in other parts of the series but all attempts to divide it have thus far been unsuccessful, the characters becoming evanescent.

Tachypus is however capable of feeble definition but the general appearance of the species is so distinct that it seems preferable to retain it.

Tachys and *Pericompsus* should probably be united the characters separating the latter being rather those of a group of species than a genus.

After placing at the head of the present series those tribes which appear to link the aggregate Carabinæ and Harpalinæ, the present tribe should then follow as that which most intimately connects a particular tribe (*Elaphrini*), of the former with the latter. Next in order follow naturally the *Pogonini* and *Pterostichini*.

Tribe XXIII.—*Pogonini*.

Antennæ slender arising under a feeble frontal ridge, the third joint usually very little longer than the second, the first two joints only glabrous. Head sometimes constricted behind the eyes, two supra-orbital setæ. Eyes (sometimes absent), rarely prominent, distant beneath from the mouth. Clypeus moderately prolonged and with a setigerous puncture each side. Labrum short, truncate or broadly emarginate, plurisetose in front. Mandibles moderately prominent, feebly arcuate, acute at tip and with a setigerous puncture on the outer side. Maxillæ slender, acute at tip, ciliate with a few stiff hairs inside, the outer lobe biarticulate, palpi moderate or long, the terminal joint variable but not subulate, the penultimate joint not pubescent. Mentum broad, its basal suture often obsolete, deeply emarginate and toothed, the tooth bifid or simple, the epilobes often dentiform, ligula moderately prominent, usually broad the tip free and arcuate, uni- or bisetose (*Pogoni*) or even plurisetose (*Trechti*), the paraglossæ slender, very little longer than the ligula and not ciliate within (*Pogoni*) or slender, long and ciliate within at tip (*Trechti*), the palpi slightly variable the last joint not subulate. Thorax with a seta at the sides and at hind angle. Body not pedunculate, scutellum distinct. Elytra sometimes margined at base, sides narrowly inflexed, margin posteriorly entire or with a very feeble sinuation and without internal plica, disc more or less striate, dorsal punctures distinct. Prosternum not prolonged at tip. Mesosternum declivous in front, moderately separating the coxæ, the epimera narrow. Metasternum variable in length, the epimera distinct, the posterior coxæ contiguous. Legs moderate or slender, the tibiæ not spinulose externally, the anterior deeply emarginate within the inner spur remote from the apex. Tarsi slender, claws simple.

The anterior tarsi of the males have two joints dilated and squamulose beneath.

As above constituted the tribe contains in our fauna two groups, separated in the following manner:

Terminal joint of palpi more or less cylindrical and obtuse at tip, that of the labial palpi as long as the preceding..... **POGONI.**

Terminal joint of palpi slender, acute at tip, that of the labial palpi shorter than the preceding..... **TRECHI.**

In addition to the above characters the form of the paraglossæ and the setæ of the ligula add some weight to the separation of the two groups.

The group **POGONI** contains in our fauna two genera:

Head more or less constricted behind the eyes or transversely impressed. Elytra not margined at base..... **Patrobis.**

Head not constricted behind the eyes. Elytra usually margined at base.

Pogonus.

This group has been the subject of a special essay by Baron Chaudoir, (Ann. Belg. xiv, pp. 21—61), in which he divides the species of the former genus in our fauna into two genera *Patrobis* and *Platidius*, and the latter into *Pogonus*, *Pogonistes* and *Diplochætus*. I have given elsewhere a review of our genera and species in which will be found my reasons for not adopting the genera suggested by Chaudoir, (Trans. Am. Ent. Soc. v, pp. 130 and 248).

The group TRECHI contains in our fauna two genera which have the second joint of the antennæ somewhat pubescent, they are as follows:

Head with distinct eyes. Anterior tibiæ slightly broader to tip, the emargination extending nearly to the middle of the tibia..... **Trechus.**
 Head without eyes. Anterior tibiæ slender, the emargination at apical third.

Anophthalmus.

Our species of the latter genus may be divided in two series, the first contains *Tellkampfi* in which the last joint of the maxillary palpus is very distinctly shorter than the penultimate, the second comprises all our other species with the same joint equal to or even a little longer than the preceding.

The tribe Pogonini of the present essay is about the same as that intended by Lacordaire, (Genera i, p. 364), less the genera which have been properly removed by Schaum and others. The latter author however, separates the two groups and places the Pogoni among the Pterostichini rendering that tribe heterogeneous and indefinable while the Trechi are found near Bembidiini.

I believe that Lacordaire and LeConte are correct in approximating the Pogoni and Trechi but I do not think the characters separating them are of tribal value. That they should be placed near Bembidiini as these authors have done seems to me proper while the relationship of the Pogoni with Pterostichus is much less evident. The structure of the ligula and paraglossæ varies but little between the Pterostichini, Patrobini and Bembidiini.

The suture between the mentum and its support is often entirely obliterated especially in *Anophthalmus*, and is very indistinct in some *Patrobis* although sufficiently marked in others, and in nearly all *Trechus*.

To this tribe and closely related to the Trechi I would refer the genus *Oopterus*. Lacordaire places the genus in his Cnemacanthides, the Broscides of other authors, but Putzeys in his monograph rejects it. Guérin-Méneville in the origin placed it among the subulipalpi and was more nearly correct than Lacordaire. *Oopterus* has all the essential characters of the group Trechi even to the impressed and recurrent stria and it seems to indicate a strong attempt to unite the Pogonini and Bembidiini.

Tribe XXIV.—**Pterostichini.**

Antennæ arising under a distinct frontal ridge, the three basal joints glabrous. Head more or less constricted behind the eyes, except in *Amara*, and with two supra-orbital setigerous punctures, clypeus prolonged beyond the base of the mandibles, the latter without setigerous puncture externally. Maxillæ ciliate or spinulose within, hooked at tip (except *Stomis* and *Agelæa*), the palpi of moderate length and of variable structure. Mentum broad, of variable length, usually

deeply emarginate and toothed, varying to a simple bisinuation; ligula at least moderate in size, often large, more or less free at tip and bisetose (quadrisetose in *Myas*), the paraglossæ slender and usually longer than it, sometimes much longer (*Stomis*, *Loxandrus*), the palpi variable in form the second joint sometimes longer than the terminal. Thorax with at least one setigerous puncture at the side and one at the hind angle. Body not pedunculate, (subpedunculate in some *Evarthrus*), scutellum distinct. Elytra narrowly inflexed, margin strongly interrupted posteriorly and with a well marked internal plica, disc usually with dorsal punctures. Prosternum not prolonged at tip, margined or not. Mesosternum oblique or vertical in front, rather widely separating the coxæ, the epimera narrow and often wider internally than externally. Metasternum and side pieces variable in length, the epimera always distinct, posterior coxæ contiguous. Middle and posterior tibiæ variably spinulose externally, the anterior slightly so near the tip, the latter broader at tip deeply emarginate within, the inner spur situated at the summit of the emargination.

The anterior tarsi of the male have three joints rather broadly dilated and squamulose beneath.

As here intended the tribe contains several groups which Lacordaire places in a higher rank. Schaum (Berl. Zeitschr. 1860, p. 179), extends the limits of the tribe in such a manner that it would be impossible to define it, as he includes the Platynini, Patrobini and the genus *Antarctia*. The former I have excluded from the structure of the elytra, the anterior tibiæ and the male tarsi, the Patrobini by the characters especially noted in the table as well as the pubescence of the antennæ and mode of dilatation of the male tarsi, while *Antarctia* belongs also near *Platynus*. Schaum has already scattered Lacordaire's *Pseudo-Feronides*, and of Section viii of the latter author (Genera i, p. 306), we have but two tribes remaining *Trigonotomides* and *Feronides*, these with all that remains of the dismembered *Stomides* constitute the tribe of the present essay which may be divided into three groups.*

Mentum feebly emarginate, sometimes simply bisinuate, the maxillæ hooked at tip.....TRIGONOTOMÆ.

Mentum emarginate and toothed.

Maxillæ hooked at tip.....PTEROSTICHI.

Maxillæ not hooked at tip.....STOMES.

Chaudoir has already indicated (Bull. Mosc. 1872), some changes in the composition of the first group, the second is the only one represented in our fauna and the third contains as far as I know but two genera, *Stomis* and *Agelæa*. From the Pterostichi (*Feronides* Lac.), in addition to the eliminations already made I would exclude *Zabrus* which is by far more closely to the Harpalinæ than to the present tribe although through it and *Amara* the relationship is approximated.

* From the characters given of the tribe Drimostomides by Chaudoir, (Ann. Belg. xv), it seems probable that it might form a fourth group of the present tribe.

Among the genera of the first group Lacordaire places *Amblytelus* Erichs. After a careful examination of the species on which it is founded I believe that author to be entirely correct. It is however an exception in the entire tribe, as far as I know, in having the fourth tarsal joint bilobed on all the feet. The general appearance of the species is rather that of a Callidide but the entire elytra with the well marked internal plica indicate the correctness of its reference here. The group Trigonotomæ seems however rather unnatural and should in all probability be separated. *Amblytelus* will in any event represent a distinct group.

The group PTEROSTICHI is the only one represented in our fauna and the number of the genera must remain the subject of discussion until a thorough monograph shall have fixed their limits. Those of our own fauna require discussion here.

In order that the reader may have some point of departure from which to follow the argument I reproduce the table of genera given by Dr. LeConte in his last discussion of the subject, (Proc. Acad. 1873, p. 302), to which I add *Myas* and *Amara*.

Last joint of palpi dilated. Mentum tooth obtuse.....	Myas.
Last joint of palpi cylindrical or slightly oval.	
Mandibles striate; elytra with one dorsal puncture.....	Evarthrus.
Mandibles not striate.	
Mentum tooth emarginate.	
Ligula carinate.	
Metathoracic episterna long.....	Lophoglossus.
Metathoracic episterna short.....	Holciophorus.
Ligula not carinate.	
Front tarsi of ♂ normally dilated.	
Second joint of labial palpi bisetose.....	Pterostichus.
Second joint plurisetose.....	Amara.
Front tarsi of ♂ obliquely dilated.....	Loxandrus.
Mentum tooth entire.....	Piesmus.

In *Myas* the characters are undoubtedly valid and in addition it might be added that the ligula is quadrisetose in front, a character figured by Migneaux but not mentioned by Duval. The elytra have no dorsal puncture and the mandibles are obliquely striate.

The striation of the mandibles which seems to have been a character of last resort in the separation of *Evarthrus* will not by any means hold good with many species of *Pterostichus*, (*rostratus*, *tumescens*, *mancus*, *coracinus*, etc.), which have the mandibles more deeply striate than very many *Evarthrus*.

The species of *Evarthrus* are readily separable into two series, the first has the penultimate joint of the labial palpi longer than the last and with three or four long setæ, the second has the terminal joint

longer and the penultimate merely bisetose, the mandibles are decidedly sulcate in the first series (species 1—12), and often very feebly so in the second, (species 13—25, Synopsis loc. cit.).

The carination of the ligula has no value as a generic character, in fact the carinate ligula occurs in many places in *Pterostichus*, (varying in degree), especially in the flatter species from the Pacific region.

The manner of the dilatation of the tarsi in *Loxandrus* serves to separate it sufficiently in a group where the characters are so feeble.

The plurisetose second joint of the labial palpi, and its consequently greater length than the third, serves to separate *Amara* from all the other genera except the first or genuine series of *Evarthrus*.

The mentum tooth seems also to have lost value as many *Pterostichus* in Europe have an obtuse tooth as in our *submarginatus*, while it appears to have escaped notice that *P. honestus* Say, has a rather long acute tooth.

While retaining *Myas* and *Loxandrus* as distinct on characters which are undoubtedly valid the other genera require some modification.

The following table represents the conclusions which I have arrived at:

Terminal joint of palpi dilated. Elytra without dorsal puncture.....**Myas.**
Terminal joint of palpi cylindrical or slightly oval.

Anterior tarsi of male normally dilated.

Terminal joint of palpi as long as or longer than the penultimate, the latter bisetose in front.....**Pterostichus.**

Terminal joint of palpi shorter than the penultimate, the latter plurisetose in front.

Elytra with one dorsal puncture.....**Evarthrus.**

Elytra without dorsal puncture.....**Amara.**

Anterior tarsi of male obliquely dilated.....**Loxandrus.**

By this arrangement *Holciophorus*, *Lophoglossus*, *Piesmus* and the second series of *Evarthrus* revert to *Pterostichus*. *Amara* is intended in its most comprehensive sense although some of its groups have characters of apparently greater value than those used above in the separation of genera. *Loxandrus* is the nearest approach in our fauna to the Trigonotomæ.

Tribe XXV.—Licinini.

Antennæ slender, moderately long, arising under a distinct frontal plate, the three basal joints glabrous (two in *Badister*). Head short, moderately stout, with two supra-orbital setæ, clypeus short not prolonged between the mandibles, emarginate and exposing the basal membrane of the labrum, with a setigerous puncture in each angle. Labrum usually short, emarginate, longitudinally impressed. Eyes moderate in size not very distant from the mouth except in *Dicælus* where they are small and very distant. Mandibles stout more or less arcuate, tips usually obtuse except in *Dicælus* where they are feebly arcuate and acute. Maxillæ hooked at tip ciliate within, the outer lobe rather slender, biarticulate, the palpi moderate in length, the last joint variable in form. Mentum deeply emarginate without

tooth (in our genera), the ligula and paraglossæ variable in form, the former bisetose at tip, the palpi moderate, the last joint variable in form but equal in length to the preceding which is bisetose in front. Thorax variable in form, with one (rarely two) lateral setigerous punctures and one near (rarely at) the hind angle. Body not pedunculate. Elytra margined at base, sides at most moderately inflexed the margin rarely (*Licinus*) sinuate, not interrupted and without internal plica, surface striate and with one (*Diplochila*) two (*Badister*) or no dorsal puncture (*Dicælus*). Prosternum obtuse at tip. Mesosternum concave in front, the epimera very narrow. Metasternal epimera distinct. Posterior coxæ contiguous. Anterior tibiæ deeply emarginate within, the middle and posterior tibiæ slightly spinulose or ciliate externally. Tarsi slender, claws simple.

The anterior tarsi of the males have three joints rather broadly dilated, densely spongy pubescent and ciliate at the sides. In *Licinus* however there are but two dilated joints.

This tribe contains but few genera and all authors seem pretty well in accord as to its composition and it is a surprising thing to find *Amblystomus* placed here by Bedel, (Ann. Fr. 1879, Suppl. p. 58), a genus whose affinities are so plainly with the Harpalini.

The affinities of the tribe are not well marked. The form of the head recalls some Harpalini, *Diplochila* resembles superficially *Microcephalus* of the Pterostichini, while *Dicælus* has some analogy with *Pelecium*.

The genera proper to our fauna are three in number, *Licinus silphoides* has in one or two instances been found but under circumstances which induce me to believe that it had been introduced, for convenience however I add it to the table.

Antennæ with three basal joints entirely glabrous.

Eighth and ninth striæ of elytra very closely approximated. The third interval with a dorsal puncture, apex very feebly sinuate..... **Diplochila.**

Eighth and ninth striæ distant.

Elytra not sinuate at apex.

Seventh interval more or less carinate at base..... **Dicælus.**

Elytra strongly sinuate at apex.

Seventh interval not carinate..... **Licinus.**

Antennæ with two basal joints only glabrous. Eighth and ninth striæ not approximated, third interval with two dorsal punctures, apex not sinuate..... **Badister.**

Diplochila has the terminal joint of the palpi more or less cylindrical and obtuse at tip. *Dicælus* and *Licinus* have the last joint more or less triangular and in *Badister* somewhat oval and flattened.

To this tribe should be referred the Australian genus *Dicrochile*. Its front closely reproduces that of our *Diplochila* while the bifid labrum is the legitimate development of the latter genus. The tarsi of the male are moreover similarly dilated while the general aspect of the species before me (*D. Goryi* Bdv.), is that of an elongate *Badister*. *Dicrochile* has the tip of the mandibles emarginate.

Tribe XXVI.—**Platynini.**

Antennæ slender rarely (*Perigona*) slightly thickened, arising below a slight frontal ridge, the condyle exposed, three basal joints glabrous, first joint not long, second usually short rarely as long as the third in which case neither is elongate, third moderate in length usually longer than the others, but rarely equal to or shorter than the fourth. Eyes moderately prominent, close to the mouth beneath. Head oval, rarely elongate, eyes not very distant from the thorax, two supra-orbital setæ, front slightly narrowed before the eyes, clypeus moderately prolonged and with a setigerous puncture each side. Labrum moderately prominent usually truncate in front and sexsetose, rarely deeply emarginate. Mandibles moderately prominent, feebly arcuate, acute at tip, without external seta. Maxillæ hooked at tip, ciliate or spinulose within, outer lobe biarticulate, palpi moderate in length, the terminal joint variable, rarely securiform. Mentum deeply emarginate, toothed or not, basal membrane more or less prominent, ligula very variable in form, bisetose in front, the paraglossæ variable in form and extent of union with the ligular, palpi moderate, the last joint somewhat variable in form, the penultimate bisetose in front. Thorax variable, sides with a setigerous puncture, a second at the hind angle when the latter is distinct or in front of the angle when it is obtuse or rounded. Elytra margined at base, sides narrowly inflexed, margin entire without internal plica, apex obliquely sinuate, sometimes deeply, or even barely perceptibly, dorsal punctures usually present, rarely (*Pristonychus*) wanting, surface striate, the eighth stria distant from the margin except in *Perigona*. Prosternum not prolonged at tip. Mesosternal epimera narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs slender, the femora sometimes thickened, tibiæ slender, not sulcate externally, the middle and posterior slightly ciliate externally, the anterior slender emarginate within, spurs moderate in length. Tarsi slender, the joints often sulcate on their outer side the fourth entire, emarginate or bilobed. Claws simple, finely serrate or pectinate.

The males have the anterior tarsi with three joints feebly dilated and squamulose beneath.

The tribe as here intended is the equivalent of Lacordaire's *Anchomenides* from which however some genera have been removed, *Loxocrepis* and *Monolobus* to the Carabinae, *Oxyglossus* and *Stenognathus* to the Lebiini.

As a part of the tribe, constituting probably a distinct group I would suggest the addition of *Antarctia* and *Geobænus* and I entirely agree with C. G. Thomson in adding *Masoreus*. I can not understand why Chaudoir (Bull. Mosc. 1876), associates in a complex, (it can not be called a tribe) *Masoreus*, the *Tetragonoderides*, *Nemotarsus* and the *Sarothrocrepides*.

Perigona seems also better placed here than elsewhere and appears to be a lead towards the Trechini in the same manner that *Olisthopus* does to the Lebiini.

A study of the form of the ligula and paraglossæ of those genera which are acknowledged on all sides to be undoubted members of the present tribe *Platynus*, *Calathus* and *Olisthopus*, seems to me to show

what little value these organs have in the formation of tribes and groups of genera. The ligula of *Olisthopus* is very plainly that of many Lebiides, *Platynus* reproduces very closely that of *Pterostichus*, *Calathus* proper is as nearly as possible intermediate between the two while the section *Pristodactyla* is a modification of *Platynus*. The tip of the ligula is free in *Platynus* and *Pristodactyla* and not free in the other genera.

The mentum tooth also seems to furnish characters of an evanescent nature. In some *Platynus*, especially those in which the hind angles of the thorax are distinct (*brunneomarginatus*, *ovipennis*, etc.), the tooth is longitudinally impressed and emarginate at tip, while in the *Agonum* type the tooth is very obtuse. The same variation is observed in *Calathus*, some having quite an acute tooth, others even bifid.

The tribe seems to be divisible primarily into three groups by the following characters:

Eighth elytral stria distant from the margin and not deeply impressed.

Thorax truncate or emarginate at base.....PLATYNI.

Thorax slightly lobed at middle of base.....MASOREI.

Eighth elytral stria confluent with the margin in its basal half, deeply impressed and attaining the suture.....PERIGONI.

Group PLATYNI.

This group might easily be separated in many minor subdivisions by including the genera not represented in our fauna.

The following genera occur with us:

Ungues more or less serrate. Mentum toothed.

Tarsi glabrous above. Elytra with dorsal punctures.....**Calathus.**

Tarsi hairy above. Elytra without dorsal punctures.....**Pristonychus.**

Ungues not serrate. Elytra with dorsal punctures.

Mentum toothed.....**Platynus.**

Mentum not toothed.....**Olisthopus.**

Olisthopus is represented in the Atlantic region by two species, the other genera occur on both sides of the continent. Of *Pristonychus* two species are known both of them identical with European forms (*complanatus* and *terricola*), and have probably been introduced, the first mentioned being rather widely spread by commerce over the globe.

Anchus Lec., founded on *Platynus pusillus* is not distinct from *Platynus*. The species is our equivalent for *Anchomenus oblongulus* Fab., of Europe, and may even be specifically identical, the only striking difference between the two being in the slightly wider thorax of our species.

To this group I would refer Wollaston's genus *Zargus*. The facies of the species is not unlike that of certain of our *Platynus* (*striatus*, *sulcatus*). The clypeus is membranous at middle even to a greater extent than in *Dicrochile* while the labrum is also bifid. Chaudoir is

willing to believe *Zargus* allied to *Dicrochile* evidently from the form of labrum, but it is really a true *Platynus* form allied to *Olisthopus* the ligular characters of which it exaggerates.

Lestignathus is also a member of the group. The description of the ligula heretofore given is certainly very erroneous. The ligula is in great part membranous with merely a small urn-shaped piece at the tip corneous, the paraglossæ are very distinct and longer than the ligula. By comparing the figure which I give of the parts it will be observed that the ligula does not differ essentially from *Platynus*. The tip of the ligula is connected with the paraglossæ by a very thin transparent membrane.

In the species of *Lestignathus* before me I observe that the suture between the mentum and its support is as completely obliterated as in *Enceladus*. It is the only instance known to me of this character in the present or the preceding tribe.

For the opportunity of examining *Zargus Schaumii* Woll., and *Lestignathus Simsonii* Bates, I am indebted to Mr. E. W. Janson.

Group MASOREI.

No representative of this group occurs in our fauna. The latest revision of the genera is by Chaudoir, (Bull. Mosc. 1876), in which contrary to his usual custom he says but little of the parts of the mouth. The fullest accounts of these are by Lacordaire and Duval, and both are inaccurate in the description of the ligula and paraglossæ. In *Masoreus Wetterhalli* the ligula is triangular, truncate in front, the paraglossæ rather broad and not connate with the ligula to the tip but folded behind it as represented in the accompanying dissection. It is evident that Lacordaire and Duval have either dissected a *Perigona* or that the latter author copied from the former who considered *Perigona* a synonym of *Masoreus*. In his tribe of Masoreides Chaudoir places seven genera some of which seem to me to belong to the next group.

Group PERIGONÆ.

This group is represented by one genus *Perigona* which has for its synonyms *Trechicus*, *Nestra* and *Spathinus*. The mentum has its epilobes prolonged to an acute spine, the emargination is deep without tooth. The ligula is narrow and truncate at tip, the paraglossæ slender and a little longer than the ligula, and united with the latter by a thin almost transparent membrane which extends from the base of the paraglossæ to the tip of the ligula.

The antennæ are rather stout beyond the third joint and the second is as long as the third.

There is certainly no reason why *Perigona* should be placed as a *Truncatipenne*. The two supra-orbital setæ remove it from association with the *Harpalide* series. Taking its entire organization it seems better placed in the present tribe than anywhere else.

Tribe XXVII.—**Anchonoderini.**

Head oval or rounded, not prolonged nor constricted to a narrow neck; with two supra-orbital setigerous punctures. Antennæ slender, not thicker externally. Eyes variable in prominence but always close to the buccal fissure beneath. Thorax more or less cordiform the lateral margin distinct, setigerous punctures at side striated the one in front of middle the second at the hind angle (except in *Lachnophorus* where it is slightly in front). Elytra feebly margined at base, the lateral margin distinct, apices rounded. Scutellum and scutellar stria distinct. Tarsi slender, fourth joint simple. Claws simple. Posterior coxæ contiguous. Body above pubescent or pilose.

In the above characters will be found all that will define the genera placed here. With other genera the tribe might possibly be more properly divided in three but for the present they will be considered groups forming an osculant tribe.

These groups are as follows :

Antennæ with four glabrous joints.

Thorax ovate, lateral margin obtuse, the posterior setigerous puncture in front of the basal angle. Body subpedunculate.....**LACHNOPHORI.**

Last joint of palpi ovoid, suddenly acuminate at tip, the surface pubescent.

Elytra with three dorsal punctures.....**Lachnophorus.**

Last joint of palpi conical, gradually narrowed to tip, the surface glabrous.

Elytra without dorsal punctures.**Euphorticus.**

Thorax cordiform, lateral margin acute, the posterior setigerous puncture at the hind angle. Body not pedunculate.....**ANCHONODERI.**

Last joint of palpi gradually narrowed to tip and slightly oval. Elytra with three feeble dorsal punctures.....**Anchonoderus.**

Antennæ with three basal joints glabrous. Thorax cordate margin acute, the hind angle with setigerous puncture..... **ATRANI.**

Palpi as in *Anchonoderus*. Dorsal punctures not evident..... **Atranus.**

The structure of the antennæ of the first two tribes seems to have been overlooked. The joints 2—4 are not absolutely glabrous in the strict acceptation of the term but they are devoid of the fine punctuation and pubescence which covers the following joints.

From the characters above given it will be evident that the *Lachnophori* osculate closely with the *Egini* and the *Atrani* with the *Platynini*, while the *Anchonoderi* are intermediate between the other two groups.

Group **LACHNOPHORI.**

Eyes large moderately prominent. Head oval, sometimes slightly constricted behind the eyes, front more or less deflexed. Elytra not margined at base, the apex with very feeble sinuation in *Lachnophorus*

or rounded in *Euphorticus*, the striæ entire, the eighth stria distant from the margin with very distinct ocellate punctures in the former genus, not distinct in the latter. The setigerous punctures of the side of the thorax are two in number, the first situated at the point of greatest width, the second midway between this and the hind angle. The thorax is not wider than the head between the eyes.

The males have the anterior tarsi slightly dilated and from the anterior angle at the inner side of the joints 1—3 proceeds a brush of fine silken hair.

To the two genera above named it will probably be necessary to add *Lasiocera*. *Euphorticus* n. g. is founded on *Lachn. pubescens* Dej., and the only characters separating it are those given in the table.

Group ANCHONODERI.

The eyes are not prominent. Head oval slightly narrowed behind the eyes, front horizontal. Elytra not margined at base, the apices rounded, surface striate, eighth stria distant from the margin and with the ocellate punctures feeble, dorsal punctures three but fine and indistinct. Thorax cordate as wide as the head, lateral setigerous punctures situated at the point of greatest width and in the hind angle.

The anterior tarsi of the males have three joints slightly dilated and with squamiform papillæ and ciliate at the side.

Anchonoderus and probably *Camptotoma* enter this group. The former genus alone is represented in our fauna by one species from Texas.

Group ATRANI.

Head oval, more elongate than *Anchonoderus* the eyes not prominent. Antennæ with but three joints glabrous, the fourth punctured and pubescent as the fifth. Thorax cordate, a little broader than the head, the setæ in the normal position at the side and in the hind angles. Elytra margined at base, the apices rounded, surface striate, the ocellate punctures well marked, dorsal punctures not distinct.

The sexual characters are as in *Anchonoderus*.

This group contains in our fauna but one genus *Atranus* Lec. The species *A. pubescens* Dej., was originally described as an *Anchomenus*; separated by LeConte with its present generic name it was placed among the Chlæniini. Chaudoir first suggested its removal from that position to that in which it is now found.

Tribe XXVIII.—Ctenodactylini.

Antennæ slender, base free, three basal joints glabrous, first joint stouter, as long as the next two, 3—11 equal or nearly so. Head rhomboidal, prolonged behind the eyes and narrowed to a distinct neck, front with two supra-orbital setæ; clypeus moderately prolonged, a setigerous puncture each side. Eyes large

moderately prominent, narrowly separated from the mouth beneath. Labrum transverse, feebly emarginate, margin sexsetose. Mandibles arcuate acute at tip, not prominent. Maxillæ slender, ciliate and spinous within, the outer lobe slender and with two equal joints, the palpi slender, the terminal joint elongate-oval and acute. Mentum deeply emarginate, toothed, (except in *Pionycha*), ligula moderately prominent, the tip bilobed or narrowed and bisetose, paraglossæ slender and acute usually longer than the ligula, palpi slender, last joint oval acute, the penultimate bisetose in front. Thorax elongate, narrower than the head, margin feeble, sides with a setigerous puncture near the middle and at the hind angle. Body subpedunculate, scutellum not prolonged between the elytra. Elytra oblong-oval, not margined at base, lateral margin distinct and entire, without internal plica, apices rounded without sinuation, disc striate, third interval with three indistinct dorsal punctures. Prosternum slightly prolonged at tip. Mesosternum oblique, the epimera very narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs slender, middle and posterior tibiæ slightly ciliate externally, the anterior emarginate, its spurs very small. Tarsi slender, the first joint as long as the next two which are oval, the fourth broad, deeply bilobed and papillose beneath, claws simple dentate or pectinate.

The tarsi are alike in the sexes. The males have one seta on each side of the apex of the last ventral segment, the females two.

The tribe as here constituted contains not only the Ctenodactylides of Lacordaire but also his Trigonodactylides.

Two groups may be indicated.

Thorax narrow, elongate. Ligula slender usually narrowed in front.

CTENODACTYLÆ.

Thorax nearly or fully as wide as long. Ligula bilobed at tip.....HEXAGONIÆ.

The CTENODACTYLÆ alone are represented in our fauna by *Leptotrachelus* which occurs in the Atlantic region.

Regarding the HEXAGONIÆ as typified by *Hexagonia* (= Trigonodactyla) the only genus known, it can only be said that it is remarkable that such an extraordinary error should have been allowed to pass current from one author to another as has been done in the description of the maxilla. After having carefully dissected the mouth of *Trigonodactyla* the parts were placed under the microscope and an appearance of the tip of the maxilla seemed to indicate that it was really terminated by a moveable hook. My custom however has been in doubtful cases to surround the parts with a drop of water on glass when all sutures and other lines become apparent. Without wishing to describe in detail the structure of the maxilla the reader is referred to the figure.

It will be observed in the two groups above indicated that the paraglossæ arise apparently by their base from the side of the ligula in the Ctenodactyli, but are prolonged to the base of the ligula in the Trigonodactyli. The difference is however more apparent than real. If the ligula be observed from the inner side the paraglossæ will be found adherent to that side, their outer edge being very close to that of the ligula itself.

The tribe has affinities in two directions, the first group with the Odacanthini, the second with the Dryptini. Schaum (Ins. Deutschl. i, p. 251), places the genera of the present tribe in his group Odacanthidæ which includes also the Odacanthini and Anchonoderini of the present essay.

Tribe XXIX.—Odacanthini.

Antennæ slender, free at base, first joint as long as the next two, three basal joints glabrous. Head oval more or less elongate, prolonged behind the eyes and narrowed to a neck, two supra-orbital setæ, clypeus moderately prolonged, truncate, a setigerous puncture on each side. Eyes large moderately prominent, very narrowly separated from the mouth beneath. Labrum moderately prominent, sexsetose in front. Maxillæ slender, ciliate and spinous within, outer lobe biarticulate with equal joints, palpi slender, the last two joints nearly equal the terminal slightly fusiform, acute at tip. Mentum emarginate and toothed, ligula usually truncate at tip and bisetose, the apex free for a short distance, the paraglossæ small rarely longer than it, the palpi slender the last joint slightly fusiform acute at tip, the penultimate not longer than it and bi-rarely trisetose in front. Thorax narrow, the margin usually feeble or even entirely obliterated, a seta near the middle of the side, a second at the hind angle which is often feeble. Body subpedunculate, scutellum not projecting between the elytra. Elytra oblong-oval, base not margined, sides narrowly inflexed, margin entire without internal plica, the apices truncate, sometimes rather obliquely. Prosternum not prolonged. Mesosternum oblique the epimera very narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs slender, the middle and posterior tibiæ slightly ciliate externally, the anterior emarginate within, the spurs small. Tarsi usually slender rarely flattened, the fourth joint at most feebly emarginate. Claws simple.

The anterior tarsi exhibit no differences in the two sexes.

In all the genera there will be observed numerous punctures, bearing short erect hairs, situated either in the second stria or the third interval.

The tribe as here constituted is the same as in Lacordaire except that *Stenochila* is excluded and *Calophæna* added. There is a close relationship between this tribe and the Ctenodactylini, and they are united by some authors, the only difference of moment being that the elytra are here truncate and there entire.

With the Lebiini and Dryptini there is also a very close relationship, the characters separating the present tribe from the former are certainly not very well marked if we admit the Lacordairean aggregation. The Lebiini of the present essay is composed of the Lebiides of Lacordaire excluding especially *Agra*, the Pericalides and *Mormolyce*. Two of these genera have an elongated head and thorax and all have truncate elytra.

I can find no constant character separating the Odacanthini from the Dryptini excepting in the form of the labial palpi. For this reason I remove *Stenochila* which has not only the long joint of the antennæ but also the penultimate joint of the labial palpi plurisetose. *Calophæna* however has the palpi and antennæ of the present tribe.

The only genus which occurs in our fauna is *Casnonia* represented by two species *pensylvanica* and *ludoviciana*, in which the setigerous punctures of the second stria are very indistinct and rarely more than four in number. The last mentioned species is remarkable in having the thoracic margin rounded and the sutures of the under side entirely obliterated. The only other instance known to me of such a structure is in *Apotomus*, which Schaum says is distinguished from all other Carabidæ in this manner.

Tribe XXX.—Dryptini.

Antennæ setaceous, free at base, three basal joints somewhat less pubescent, the first usually elongate and thicker than the following. Head constricted at a variable distance behind the eyes to a neck which sometimes expands semi-globularly at its insertion in the thorax, front narrowed before the eyes, two supra-orbital setæ, clypeus moderately prolonged and with a variable number of setigerous punctures, sometimes (*Drypta*) without any. Eyes oval moderately prominent, usually not very close to the mouth beneath. Labrum transverse, moderately prominent, truncate or feebly emarginate, sexsetose in front, the two lateral setæ in *Drypta* stouter, longer and nearly vertical. Mandibles slightly prominent, feebly arcuate, acute at tip. Maxillæ hooked at tip, ciliate or spinous within, outer lobe usually slender, biarticulate, with equal lobes, palpi long, more or less hirsute, the terminal joint more or less triangular. Mentum variable in form, deeply emarginate with or without tooth, ligula and paraglossæ variable in form, the palpi moderately long, the terminal joint shorter than the preceding, more or less triangular in form, the penultimate longer and plurisetose in front. Thorax variable in form, often moderately long, the lateral margin acute, (except in *Drypta*) the lateral setæ often indistinct, that of the posterior angle usually entirely absent. Scutellum distinct. Elytra not margined at base, lateral margin acute, entire, apex truncate, dorsal punctures absent except in *Stenochila*. Prosternum not prolonged. Mesosternal epimera very narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs moderately long, the femora often slightly clavate, the middle and posterior tibiæ ciliate or slightly spinous externally, the anterior slender, deeply emarginate within, the tibial spurs moderate in length, rarely (*Galerita*) long. Tarsi variable in form, the claws simple or pectinate.

The males have the anterior tarsi dilated, sometimes very slightly and densely pubescent beneath.

The tribe as here constituted is the equivalent of Lacordaire's Galeritides, for which later authors have adopted the name which I retain.

I have already given in the Ctenodaetylini the reasons for the change of places of *Stenochila* and *Calophæna*. *Polystichus* is removed to Helluonini for reasons which will hereafter be given. The essential character separating the Dryptini from all other Truncatipennes is found in the structure of the labial palpi. The form of the basal joint of the antennæ usually relied on is by no means a good character as several of the preceding tribes have the first joint even longer than some of those of the present. Where the scape attains its typical length it is usually

more or less curved near the base as in *Agra*. It is difficult in many of the genera to say how many joints are truly pubescent as the hairs extend nearly to the base of the first joint.

The head assumes three forms, the first is that typified by *Galerita* in which the head is elongate-oval, considerably prolonged behind the eyes then constricted to a very narrow neck which dilates to a semiglobular condyle, the second is the *Zuphium* type where there is a moderate prolongation behind the eye and then very suddenly constricted to a narrow neck which is cylindrical, while in *Drypta* the constriction is close to the eyes, not abrupt and the neck rather stout and cylindrical. The latter genus is further remarkable in having the setæ of the clypeus entirely wanting, their function being replaced by those of outer side of the labrum which acquire an unusual development, a similar occurrence has been observed in *Pelecium*.

This tribe through *Galerita* and *Stenochila* shows a relationship well marked with the Odacanthini, and by *Thalpius* to the Helluonini through *Polystichus* which must be placed in the latter tribe.

Our genera are not numerous and may be known by the characters of the following table:

Neck very narrow.

Head prolonged behind the eyes, neck inserted in thorax by a semiglobular condyle. Clypeus with two setigerous punctures each side.....**Galerita.**

Head triangular scarcely prolonged behind the eyes, very suddenly constricted to a narrow cylindrical neck. Clypeus with but one setigerous puncture on each side with a long seta.....**Zuphium.**

Neck stout, head very little constricted.

Thorax truncate at base, antennæ with third joint shorter than the fourth.

Diaphorus.

Thorax subpedunculate at base, antennæ with joints 2—4 nearly equal.

Thalpius.

The above genera are represented on both sides of the continent.

Tribe XXXI.—**Mormolycini.**

Antennæ slender, nearly as long as the body, the base exposed, four basal joints glabrous, the following densely punctured and very finely pubescent, first joint elongate pyriform, second short, third as long as the head, fourth a little shorter, 5—11 much shorter, subequal. Head very long behind the eyes, forming a flattened neck which is moderately constricted at base and expanded semiglobularly at its insertion in the thorax, front with two small supra-orbital setæ. Clypeus moderately prolonged, feebly emarginate, a setigerous puncture each side. Eyes round, moderately prominent, distant beneath from the buccal fissure. Labrum nearly square, feebly emarginate and sexsetose in front. Mandibles stout, arcuate, tip acute, a small tooth at middle on the right side, near apex on the left, outer side concave at base, without setigerous puncture, upper side with a short but deep cicatrix-like fissure at the end of the carina. Maxillæ moderately short, hooked at tip, inner edge densely ciliate, outer lobe slender, biarticulate, the palpi stout,

the terminal joint subcylindrical obtuse at tip. Mentum deeply emarginate and with a slender acute tooth. Ligula slender acute and bisetose at tip, the paraglossæ broad, membranous, adhering to the ligula to the tip and prolonged beyond it but not becoming united, the palpi stout, terminal joint subcylindrical, obtuse at tip, with short ciliæ on its inner side, penultimate joint bisetose in front. Thorax elongate the margin with a coarsely dentate expansion and without setigerous punctures. Scutellum distinct. Elytra (less the expansion) oblong-oval, truncate at tip, the sutural angle acute, base not margined, very narrowly embracing the body, the margin acute and expanded in a foliaceous plate which is prolonged beyond the apices of the elytra, surface striate, the third interval with three dorsal punctures each situated in a small tubercle. Prosternum not prolonged, the thoracic sutures obsolete. Mesosternum narrowly separating the coxæ, the epimera broad and attaining the coxæ. Metasternal episterna also attaining the middle coxæ, the epimera distinct. Posterior coxæ contiguous. Legs long and slender, middle tibiæ ciliate near the tip, posterior tibiæ not ciliate, anterior tibiæ emarginate within, the spurs on all the tibiæ small. Tarsi similar in the sexes, slender, the first joint as long as the next three and with short hairs beneath, the other joints not ciliate. Claws simple.

This tribe is represented by the single genus *Mormolyce* containing three species which occur in Java and adjacent regions. It is especially remarkable in being the only exception, as far as I know, to the value of the mesosternal epimeron in determining the position of a genus in the Carabide series. In the preceding pages I have attempted to demonstrate that *Siagona* and the Ozænini have the mesosternum formed in the manner normal to the present sub-family. It will also be observed by the figure of the under side of *Mormolyce* (Pl. III, fig. 3), that the metasternal episterna also reach the middle coxæ, a character entirely without parallel in all the Carabidæ although quite common in Dytiscidæ and present in *Amphizoa*.

The position of the genus after disregarding the anomalous sternal structure is still open to discussion. The association of it with the Feronides (Pterostichini) by the older authors is now generally abandoned and all seem to agree that it is a true Truncatipenne. Chaudoir (Bull. Mosc. 1848, i, p. 123), indicated for it a position near *Thyreopterus* an opinion since repeated (Ann. Belg. xii, 1869, p. 133), but with which I can not agree. Even the most enthusiastic advocates of such an idea must admit that it is about as unlike the other genera of the Thyreopterides of Chaudoir as it is unlike an ordinary *Lebia*.

Those whose range of study extends over the entire Coleoptera have observed that genera occur in very many families in which the species, by the enormous development of some members of the external portion of the body, assume a form or appearance entirely concealing the true relationship. Instances of mimicry are numerous but these are foreign to the idea at present intended.

Mormolyce is in particular one of those genera with unusual developments. These are the margining of the thorax and the leaf-like expansion of the elytral margin. If we dismiss for a moment from our consideration these appendages and allow *Mormolyce* to stand as if deprived of them it becomes reduced to an insect not very different from an Odacanthide or a Ctenodactylide.

The elongate head, with the extremity of the neck dilated in a semi-globular manner, the narrow thorax, the elytra not margined at base, the dorsal punctures all on the third interval, are characters which cannot be neglected.

The ligula and paraglossæ of *Mormolyce* are said to be as in the Thyreopterides but from the descriptions these organs vary in that group, and in the present genus I do not find as much resemblance to *Eurydera* as to *Coptodera ærata* (84).

I would suggest that *Mormolyce* be constituted a distinct tribe to be placed in the vicinity of the Odacanthini and Ctenodactylini.

Tribe XXXII.—Agrini.

Antennæ slender, moderately long, arising under a slight frontal plate, three basal joints glabrous, first joint moderate in length, slightly arcuate near the base, second short, third longer than the following which are subequal in length. Head elongate, prolonged behind the eyes and suddenly constricted to a neck which forms a semiglobular condyle, front with two supra-orbital setæ. Clypeus moderately prolonged, a setigerous puncture each side. Eyes moderately prominent, close to the mouth beneath. Labrum moderately prominent, nearly square or slightly transverse, sexsetose in front. Mandibles slightly prominent, feebly arcuate, acute at tip without setigerous puncture. Maxillæ hooked at tip, with very short ciliæ within, the outer lobe rather stout, biarticulate, the terminal joint shorter, palpi stout not long, the terminal joint subcylindrical, longer than the preceding and obtuse at tip. Mentum moderately emarginate with an obtuse tooth sometimes nearly as long as the lateral lobes. Ligula coriaceous, more or less rhomboidal, moderately prominent, quadrisetose, two setæ at the tip and one on each side posteriorly, paraglossæ membranous, adherent to the ligula and not longer, palpi longer than the maxillaries, the terminal joint broadly securiform, the penultimate bisetose in front. Thorax elongate conical, the lateral margin almost obliterated, the lateral and angular setigerous punctures indistinct. Scutellum distinct, feebly prolonged between the elytra. Elytra prolonged at base and not margined there, sides narrowly inflexed, lateral margin entire, without internal plica, the apex truncate and often spinous or dentate, surface variably sculptured but when striate the dorsal punctures are numerous and very evident on the striae 2—4—6, the ninth stria close to the margin. Prosternum not prolonged. Mesosternum oblique, the epimera very narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs moderate in length, femora, especially the anterior, somewhat clavate, tibiæ slightly ciliate externally, the terminal spurs small, anterior tibiæ deeply emarginate within. Tarsi moderate in length, flattened on all the feet, ciliate above, densely pubescent beneath and ciliate at the sides, fourth joint deeply bilobed. Claws stout, pectinate in their entire length.

The anterior tarsi of the male are more dilated than in the female. The sexual characters are otherwise variable and are found in the form of the middle and posterior tibiae and the sculpture and pubescence of the abdomen.

In comparing the species of this tribe with those of the Odacanthini and Ctenodactylini it will be seen that there is a close relationship which can not be neglected for the structure of the ligula alone. By retaining *Agra* in any part of the true Lebiide series we introduce confusion as great as with *Mormolyce*. In many parts of the Carabide series the ligula has been entirely neglected where its consideration would cause an obvious violation of natural affinities. Conspicuous among these cases of neglect we find the Graphipterini and Athiini.

It may be well to call attention to the fact that in all the tribes with long head and thorax the tibial spurs are exceptionally small, and Lacordaire says of *Agra* "sans épines terminales."

The species of this tribe belong to two genera, *Agra* and *Agridia* and all with one exception occur in intertropical America.

Tribe XXXIII.—**Egini.**

Antennæ moderate in length, slightly thicker externally, arising under a feeble frontal ridge, the four basal joints glabrous, that is they are somewhat hairy but not densely punctured and finely pubescent as the following joints, the basal joint moderately stout but not equal in length to the two following joints together. Head oval rather strongly constricted at a distance behind the eyes to a neck, with two supra-orbital setæ. Eyes oval in the axis of the head, moderately prominent but distant beneath from the mouth. Clypeus feebly prolonged, a setigerous puncture each side. Labrum feebly prominent, slightly emarginate, sexsetose. Mandibles acute at tip, without setigerous puncture externally. Maxillæ slender, slightly hooked at tip, spinulose and ciliate internally, outer lobe slender, biarticulate, the terminal joint shorter, the palpi moderate in length, the terminal joint obovoid, suddenly narrowed and prolonged at tip, surface pubescent. Mentum deeply emarginate and with a short obtuse tooth; ligula not prominent, emarginate and bisetose at apex, the tip free for a short distance, paraglossæ slightly longer than it, palpi moderate the terminal joint like that of the maxilla, the penultimate bisetose in front. Thorax ovate, somewhat constricted at base, margin almost entirely obliterated, sides with two setigerous punctures placed almost as in the *Clivina*. Body distinctly pedunculate, scutellum not visible between the elytra. Elytra not margined at base and without scutellar stria, lateral margin obsolete, sides narrowly inflexed, apex subtruncate, disc striate at base, dorsal punctures three but indistinct. Prosternum not prolonged. Mesosternum oblique, the epimera very narrow. Metasternal epimera distinct, posterior coxæ separated. Legs slender, tibiae ciliate externally, the anterior deeply emarginate within. Tarsi slender and long, fourth joint entire. Claws simple.

The anterior tarsi of the male are merely a little stouter than those of the female and somewhat more ciliate.

I know of but one genus which enters this tribe, *Ega*. In the books it forms a part of Lacordaire's tribe Anchonoderides and with Schaum and LeConte of the more comprehensive tribe Odacanthini.

The many peculiar characters which *Ega* possesses seem to me sufficient to place it as a distinct tribe. In the present series the pedunculate body is known to me as occurring only in the Anthiini and it is here too that we have the posterior coxæ separated and the eyes oval in the axis of the head. It is by no means easy to determine the true thoracic setigerous punctures as there are many short erect hairs, the true tactile setæ will be found remaining when the others are lost. The obliteration of the side margin of the thorax is nearly as complete as in *Apotomus* while the absence of the lateral margin of the elytra is an important character which appears to have been lost sight of.

The separation of the posterior coxæ seems to me evidence of a degraded or undeveloped type.

The relationship of the present tribe is undoubtedly with certain members of the Anchonoderini while the relationship with the Anthiini indicated above may be merely the possession of several characters in common; there may, however, be genera unknown to me which show a true affinity between the two tribes.

Ega is represented in our fauna by two species, *Sallei* from the Gulf States, *lætula* from California. In the first the elytral grooves or striæ do not extend behind the middle and the three dorsal punctures are faintly indicated; in the second the striæ extend at least two-thirds of the elytra and I have been unable to detect any dorsal punctures.

Tribe XXXIV.—Lebiini.

Antennæ slender, rarely slightly thickened, arising under a slight frontal ridge, the condyle usually exposed, the three basal joints generally glabrous, sometimes however, but two or four. Head oval, constricted to a neck or not, with two supra-orbital setæ, front either parallel or with convergent sides, clypeus with a setigerous puncture each side. Eyes round or oval, moderately prominent very narrowly separated from the mouth beneath. Labrum usually broader than long, sometimes prolonged covering the mandibles, either truncate or emarginate and sexsetose in front. Maxillæ slender hooked at tip, rather obtusely in *Tetragonoderus*, ciliate or spinulose within rarely toothed behind the tip (*Eucærus* and *Tetragonoderus*) the apex ciliate in many genera, outer lobe biarticulate but otherwise variable, the palpi variable in form from slender to securiform. Mentum more or less deeply emarginate, the epilobes always distinct, the bottom of the emargination either without tooth or with a tooth of variable form; ligula and paraglossæ very variable, the palpi also variable the terminal joint equal to the preceding or longer, the latter bisetose in front (except in some *Cymindis*). Thorax variable in form, sides distinctly margined and with a seta at the side and at the basal angle. Elytra truncate at tip in a variable manner, the margin acute, entire and narrowly inflexed, without internal plica, the base margined. Prosternum usually obtuse at tip, rarely acute or prolonged (*Cyclosomus*). Mesosternal epimera narrow, sometimes almost entirely concealed by the episterna. Metasternal epimera distinct, the posterior coxæ contiguous. Legs usually slender, not very

long, tibiae slender the terminal spurs moderate or short rarely long (*Tetragonoderus*, *Nemotarsus*), simple, rarely finely serrulate along their margins (*Tetragonoderus*, etc.). Tarsi variable in form, the fourth joint narrow, emarginate, or deeply bilobed, the claws usually pectinate or serrulate, sometimes however simple.

The sexual characters are variable. The anterior tarsi are often very nearly equal in the sexes, sometimes with three or four joints slightly dilated in the male, rarely the middle tarsi are dilated (*Pinacodera*). The anal segment has usually more setae in the female than in the male.

The tribe as here intended is the equivalent of Lacordaire's Lebiides and Pericalides omitting especially *Agra* and *Mormolyce*.

After having given the tribe a careful study, having purposely left it for the final work in the present paper, I have found myself with the same result as that arrived at by Lacordaire and LeConte, namely, that it is not possible to divide the tribe in any satisfactory manner. I have dissected the mouth parts of all our own genera which are figured, with many foreign to our fauna and the only conclusion I can arrive at, is, that the ligula and paraglossae have very little value in defining groups of genera. I can cite the two figures of the ligula of *Callida* (93, 94), in these the paraglossae are not united by a membrane which crosses the front of the ligula, nor do we find it so in *Dromius*. In both of the groups which Chaudoir bases on these two genera as types the paraglossae should be united by a membrane crossing the front of the ligula.

The Lebiides of Baron Chaudoir are separated more especially by the paraglossae pilose at tip and the intermediate tibiae of the male notched within near the tip. The other characters given, occur, as every one will see, in all parts of the Lebiide series. Other genera as in *Dromius* (86) and *Pinacodera* (97) have the paraglossae ciliate at tip, while the male of *Coptodera ærata* has the middle tibiae incised as in *Lebia*. The further division of the Lebiides into genera with and without epilobes to the mentum is also misleading and I am quite prepared to state that there is no Carabide without epilobes.

By these remarks I do not desire to discredit the work done by Baron Chaudoir* who is acknowledged to be the ablest Carabologist of the present time. The tribes and groups he indicates are composed of

* This and the preceding paragraphs may read strangely now that Chaudoir is no more. They were written before his death and intended as fully for his perusal as for any one else. For many years Chaudoir has contributed valuable papers to our knowledge of the *Truncatipenne* series, and as it has been found impossible to present my own views without directly quoting him, I do not think that any change of language, apparently less critical, would be of benefit in any respect. I can only add that our relations, even with differences of opinion, have always been of the most cordial nature, and were he living the remarks here presented would be accepted in the spirit in which they are intended.

genera very closely and naturally allied, but the definition of these groups is very artificial and we find already a great number of odd genera thrown aside which will not fit in any tribe he has proposed and which must of necessity form groups by themselves. Such a minute subdivision is confusing but would be excusable and even acceptable if the characters on which it is founded were even moderately constant, but with the few genera which occur in our fauna I can say that no characters exist in the ligula which can be used to divide the tribe into groups.

In the accompanying table the characters seem hardly to warrant any further explanation. Attention might be directed to the very long tibial spurs of *Tetragonoderus* and *Nemotarsus*, in the former genus their edges are finely serrulate a remarkable character in the present family and one which is by no means common in Coleoptera generally.

In *Pentagonica* (Rhombodera) which in its form occupies an intermediate position between *Lebia* (Aphelogenia) and *Eucærus* the mandibles are without scrobes, that is they are deprived of that triangular groove on the outer side so commonly present in the Carabidæ. The mandibles here recall those of *Loricera* or *Leistus* although the lower edge is less expanded than in these two genera.

To the present tribe and in close association with *Tetragonoderus*, Chaudoir has added *Cyclosomus* a curious genus of a form and aspect closely resembling *Omophron*, it is however correctly placed by that author.

Eucærus which will be found in one of the extremes of the following table is one of those unfortunate genera which has never been allowed to remain for any length of time in any one position. At its beginning it was placed near the Harpali, thence (Class. Col. N. A. p. 22), it was removed and made part of a rather composite tribe and placed near the Lachnophori. Chaudoir accepts this view. While it is doubtless an osculant form it seems to me more nearly allied to the present series than to *Lachnophorus*.

The maxillæ present a few variations from the usual fixed type and attention is directed to the figures of *Tetragonoderus*, *Eucærus* and *Pinacodera*.

The antennæ are very constant in their pubescence. In the vast majority of species the three basal joints and the adjacent half of the fourth are glabrous, but in *Phlæoxena* four joints are smooth while in *Eucærus* the third is pubescent and the second scarcely less so.

The genera below are those known at present in our fauna. To have introduced those exotic genera known to me would not have been a difficult task, but it seemed to me to be unnecessary as very nearly if

not quite all the subdivisions suggested by Chaudoir are represented by genera around which the exotics may be grouped.

The following table will enable our genera to be recognized :

Tibial spurs very long.

Head not constricted ; the tibial spurs finely serrulate. Ungues simple or finely serrulate.....**Tetragonoderus.**

Head constricted ; tibial spurs simple. Ungues with long pectination.

Nemotarsus.

Tibial spurs short or at most moderate in length.

A.—Mandibles with distinct scrobes.

A-a.—Antennæ with at least three glabrous joints.

b.—Head constricted behind the eyes.....**Lebia.**

bb.—Head not constricted.

c.—Labrum large prominent, covering in great part the mandibles.

d.—Antennæ with three glabrous joints ; middle tibiæ of male incised within near the tip**Coptodera.**

dd.—Antennæ with four glabrous joints ; middle tibiæ of male not incised.

Phlæoxena.

cc.—Labrum moderate, not large.

e.—Tarsi slender, fourth joint entire.

f.—Labial palpi slender.

g.—Thorax truncate at base.

Mentum not toothed, unguis serrate.....**Dromius.**

Mentum toothed, unguis simple.....**Apristus.**

gg.—Thorax slightly lobed at base, unguis serrate.

Mentum not toothed.....**Blechrus.**

Mentum with a small emarginate tooth.....**Metabletus.**

ff.—Labial palpi thick, oval ; unguis more or less serrate....**Axinopalpus.**

ee.—Tarsi with the fourth joint emarginate or bilobed.

h.—Ungues simple.....**Tecnophilus.**

hh.—Ungues serrate.

i.—Mentum not toothed, fourth tarsal joint deeply bilobed. Tarsi hairy above.

Euproctus.

ii.—Mentum toothed.

j.—Thorax truncate at base.

k.—Tarsi with fourth joint bilobed.....**Callida.**

kk.—Tarsi with fourth joint emarginate.

l.—Tarsi not hairy above.

m.—Last joint of labial palpi more or less triangular or securiform.

n.—Thorax with the base oblique each side, the sides narrowly margined.

Philophuga.

nn.—Thorax with base squarely truncate, the sides rather widely margined especially posteriorly.....**Plochionus.**

mm.—Terminal joints of both palpi similar, more or less cylindrical, truncate.

Pinacodera.

ll.—Tarsi hairy above. Penultimate joint of labial palpi usually with more than two setæ.....**Cymindis.**

jj.—Thorax lobed at middle of base. Tarsi hairy above. Last joint of labial palpi securiform.....**Apenes.**

- A-b.**—Antennæ with less than three joints glabrous. Mentum not toothed.
 Terminal joint of palpi ovate, acuminate at tip and pubescent. Ungues
 simple..... **Eucærus.**
- B.**—Mandibles without scrobes. Mentum not toothed.
 Ungues simple, fourth tarsal joint not dilated..... **Pentagonica.**
 Ungues pectinate, fourth tarsal joint bilobed..... **Onota.**

TETRAGONODERUS Dej.—This genus is made the type of a tribe by Baron Chaudoir (Bull. Mosc. 1876), in which four other genera are included, the essential characters being the form of the maxillæ (80) and the structure of the tibial spurs. The extremity of the inner lobe of the maxilla is spoken of by Chaudoir rather as an appendix, but it seems to be rather the true termination, the hook behind it corresponding with the tooth which will be seen in the figure of *Eucærus* (100). If we consider the tooth as the tip of the maxilla we have the anomaly presented of the outer or palpar lobe longer than the inner, a character not otherwise observed in the Carabidæ.

NEMOTARSUS Lec.—This name has through the suggestion of some extreme purists been lengthened to *Nematotarsus* without however adding anything to a knowledge of the genus itself. This genus is placed by Chaudoir in association with *Tetragonoderus* but not in the same tribe. It is one of those genera which will fit in several tribes on a ligular basis but will be excluded by characters which must be allowed to have more weight.

LEBIA Latr.—This genus has also been made the type of a tribe by Chaudoir, to which he assigns characters by no means peculiar to the genera included. Attention has already been partially directed to these characters. In consequence of the existence of epilobes in the mentum of all our species, it has been found impossible to retain the divisions suggested by Chaudoir. In the figures of the mentum *Aphelogenia* (83) will be found to have epilobes but less developed than in *Loxopeza* (82). The species occurring in our fauna are all referred to *Lebia* while the divisions suggested by Chaudoir are rather groups of species than genera.

COPTODERA Dej.—This is also the type of a tribe in the hands of Baron Chaudoir, and that future students of our fauna may have the special characters of the tribe at hand I reproduce them. (Ann. Belg. xii, 1869): "*Ligula* cornea, apice haud libera plerumque bisetosa, interdum præterea pluripilosa; *paraglossæ* membranaceæ, apice pilosulæ, aut conniventes (ut in *Coptodera*) aut ligulam vix superantes. *Cætera* ut in *Thyreopteridis*."

In what respect the Coptoderides differ from the Thyreopterides I have not been able to realize even with patient study.

PHLEOXENA Chaud.—This genus is due to Chaudoir (Ann. Belg. xii, 1869, p. 145), and is founded on species mostly Mexican with which our *Coptodera signata* Dej., is associated. In his generic characters Chaudoir says: "*Mentum* * * * medio sinu dente majusculo, trigono, apice rotundato," but I do not observe any tooth whatever in our species.

This genus is part of the tribe Thyreopterides.

DROMIUS Bon., *APRISTUS* Chd., *BLECHRUS* Motsch., *METABLETUS* Schmidt, and *AXINOPALPUS* Lec., have not, as far as I am aware, been reviewed by Chaudoir, and are probably a part of his intended tribe Dromiides which is merely casually mentioned in his preliminary remarks on the Callidides, (Ann. Belg. xv, 1872). These genera may therefore be passed without further remark than—that the ligula is not always bordered in front by the extension of the paraglossæ, not even in *Dromius*. Certain European authors, among them Baron Chaudoir, have rejected the name *Axinopalpus* for *Variopalpus* having been misled, evidently, by the date given in the Munich Catalogue. The former genus was published in 1846, the latter in 1848.

TECNOPHILUS Chaud., Bull. Mosc. 1877, i, p. 240.—This genus is suggested for those species in our fauna formerly placed in *Philotecnus* Mann., with which Chaudoir says they have nothing to do.

"Vu la configuration de sa languette que ses paraglosses ne bordent pas antérieurement, ce genre ne fait pas partie du groupe des *Callidides*, mais de celui des *Mimodromiides* dont je n'ai pas encore exposé les caractères qui demandent à être mieux étudiés."

The ligula and paraglossæ reproduce exactly those of a species of *Callida*, as yet undescribed, which resembles *smaragdina* very closely and differs from it in nearly the same manner that *decora* and *punctata* do from each other.

CALLIDA Dej., *EUPROCTUS* Sol., *PLOCHIONUS* Dej., form part of the *Callidides* of Chaudoir, (Ann. Belg. xv, 1872), which has already been sufficiently remarked upon. Several of our species of *Callida* have been separated to form the genus *Spongoloba* Chd., based on sexual peculiarities of the male which seem to me to have had too great value assigned them. *Euproctus* is represented in our fauna by one species described as *Onota trivittata* Lec. (Pl. IV, fig. 3).

PHILOPHUGA Motsch., contains those species formerly placed in *Glycia*. They are reviewed by Chaudoir, (Bull. Mosc. 1877, i, p. 243), who leaves us in doubt whether the genus is part of his Callidides or not. They are not included in that essay.

CYMINDIS Latr., is the subject of an essay by Chaudoir, (Berl. Zeitschr. 1873), and with three other genera constitutes the tribe Cymindides, but I find that there are no special characters assigned to it.

PINACODERA Schaum, and APENES Lec., are treated by Chaudoir in a paper entitled, "Genres aberrants du groupe des Cymindides," (Bull. Mosc. 1875), and as there are no characters assigned to the group it is impossible to ascertain in what respect these genera are especially aberrant.

EUCÆRUS Lec., has already been referred to.

PENTAGONICA Schmidt-Göebel, which has for its synonyms *Didetus* Lec., and *Rhombodera* Reiche, is the subject of a short essay by Chaudoir, (Bull. Mosc. 1877, i, p. 212), who says that it is "one of those aberrant genera which can not be made to enter any of the groups established at the present time. I believe that Mr. Bates is correct in placing it in a special group under the name *Pentagonicinæ*," (Trans. Ent. Soc. London, 1873, p. 320). This is certainly an easy settlement of the difficulty, more particularly as no characters are assigned to the group.

CORSYRA.—This genus does not occur in our fauna. I merely introduce it here to express a view that it has nothing to do with *Graphipterus* as intimated by Chaudoir, (Bull. Mosc. 1876). The well marked supra-orbital and thoracic setæ, the structure of the labial palpi and tibial spurs all forbid its position there.

ONOTA Chd., is represented by one species found in Florida:

O. Floridana n. sp.—Rufo-testaceous, elytra brilliant green with extremely narrow lateral and apical rufous border. Antennæ and palpi entirely pale. Front with moderately deep arcuate groove within the insertion of the antennæ, another near the edge. Thorax as wide as the head including the eyes, as broad as long, angulate in front of middle, the sides anteriorly feebly arcuate, posteriorly sinuate, hind angles acute. Elytra moderately deeply striate, the striæ finely punctured, intervals slightly convex, smooth. Legs rufo-testaceous. Length .20—.25 inch; 5—6.25 mm. Pl. IV, fig. 4.

Three specimens without sexual differences are before me, collected by Hubbard and Schwarz, near Lake Poinsett, Florida.

It appears to resemble *O. bicolor* Chd., but is larger and the pale border of the elytra is extremely narrow. Among our Lebiini it will be at once known by the angulate sides of the thorax and distinct hind angles.

A fuller description of the genus (which is placed by Chaudoir in the *Callidides*), will be given in a future essay on the species of the present tribe.

In concluding the Lebiini I regret to believe that the genera have been inordinately multiplied, and the higher divisions whether called

groups, tribes, or sub-families, have become so numerous and are based on such shadowy characters as to envelope the subject in an almost impenetrable cloud.

Tribe XXXV.—**Helluonini.**

Antennæ moderate in length, rather stout, usually compressed arising under a distinct frontal plate, all the joints more or less pubescent, two or four at the base less densely, first joint stout, equal in length to the next two. Head broadly oval, not narrowed in front of the eyes, with a distinct neck more or less abruptly formed, clypeus moderately prolonged, a setigerous puncture at each side, front with two supra-orbital setigerous punctures. Eyes round, moderately prominent, close to the mouth beneath. Labrum usually large and prominent, more or less concealing the mandibles, sexsetose in front. Mandibles stout, arcuate, rarely prominent, acute at tip. Mentum broad, deeply emarginate usually toothed, ligula prominent, bisetose at tip, the paraglossæ adherent to the sides rarely (*Polystichus*) longer than it and usually semicorneous, the palpi of moderate length, the terminal joint elongate-oval or fusiform and obtuse at tip, the penultimate bisetose in front. Maxillæ hooked at tip, ciliate or spinous within the outer lobe rather stout, biarticulate, the palpi stout, the terminal joint oblong-oval truncate at tip, more or less flattened. Thorax more or less cordate, sides and hind angles with a distinct setigerous puncture. Elytra oblong, truncate at apex, base not margined, sides narrowly inflexed, margin entire, disc striate or broadly sulcate, without dorsal punctures. Prosternum not prolonged. Mesosternal epimera narrow. Metasternal epimera distinct, the posterior coxæ contiguous. Legs moderate in length, the anterior femora more or less clavate. Tibiæ sometimes (*Helluomorpha*) compressed and finely bicarinate on the outer edge, the anterior rather stout and broad, deeply emarginate within, spurs moderate in length. Tarsi moderate in length usually ciliate above, the fourth joint either entire, emarginate or even bilobed. Claws simple.

The anterior tarsi of the male are rarely broader than the female.

This tribe is the equivalent of the *Helluonides* of Lacordaire, to which I add *Polystichus*.

The form of the ligula has been almost the entire reliance in the separation of this tribe from the other *Truncatipennes*, but the method usually adopted in describing the ligula as having no paraglossæ is entirely erroneous. Although the labium (which term includes the entire organ, ligula and paraglossæ), is almost entirely corneous in the majority of genera, the parts which compose it are as evident as in *Agra* in which the whole organ is almost entirely membranous.

Polystichus is added from the *Dryptini*, as it lacks the palpar structure which is characteristic of that tribe; it has moreover the front parallel before the eyes, forming a plate over the antennæ, the anterior legs rather stout and the antennæ distinctly compressed. These latter are decided characters approaching it to the present tribe. It is however one of those forms which should be placed in the position of an intermediate. Its ligula and paraglossæ are unlike the present tribe the paraglossæ

being membranous, a little longer than the ligula, arcuate, obtuse and finely ciliate. In the general form of body, especially the thorax, *Polystichus* resembles very greatly *Helluomorpha*.

The latter genus is the only one known to inhabit our fauna.

Helluodes Westw., placed by him in the present tribe does not belong here, it is evidently allied to *Anthia*.

Tribe XXXVI.—*Graphipterini*.

Antennæ more or less compressed, arising at a distance beneath a slight frontal ridge, three basal joints glabrous, third joint equal in length or a little longer than the next two together. Head with front deflexed, two supra-orbital setæ, neck stout, clypeus slightly prolonged, a setigerous puncture each side. Eyes oval in the axis of the head, very distant beneath from the buccal fissure. Labrum moderately prominent, arcuate in front but slightly emarginate at middle, sex-setose. Mandibles moderately stout, arcuate near the tip which is acute, inner edge with slight tooth behind the middle, outer edge without setigerous puncture. Maxillæ hooked at tip, coarsely and densely ciliate within, outer lobe biarticulate, the terminal joint a little longer, palpi moderate in length the last two joints nearly equal, the terminal slightly oval and truncate at tip. Mentum deeply emarginate, not toothed but with the bottom of the emargination slightly prominent, ligula moderately prominent, elongate-oval, bisetose at tip, the paraglossæ broad, membranous, adherent in their entire length and meeting by a narrow band at the apex of the ligula, palpi moderate in length, the terminal joint cylindrical, arcuate, slightly stouter at middle, truncate at tip, shorter than the preceding which is plurisetose in front. Thorax variable in form, cordate or trapezoidal, margin acute, sides without setigerous punctures. Elytra not margined at base, broadly oval or suborbicular, feebly convex, apex truncate, margin acute, no internal plica, the ocellate punctures of the margin indistinct (or entirely wanting?). Prosternum acute at tip, not prolonged. Mesosternum oblique, the epimera extremely narrower. Metasternal epimera distinct, posterior coxæ contiguous. Legs slender moderately long. Tibiæ with the outer edge sulcate in its entire length and spinulose, the anterior emarginate within, the inner spur remote from the apex. Posterior tibiæ with the terminal spurs dissimilar, the inner very slender, the outer cylindrical, compressed, and obliquely truncate at apex. Tarsi slender with stiff bristles beneath, those at the tips of the joints long. Claws very slender, simple. Body winged or not.

The males have three joints of the anterior tarsi slightly dilated with narrow squamules beneath.

This tribe which is essentially African contains but two genera, *Graphipterus* and *Piezia*. As Lacordaire correctly observes they are in most respects *Truncatipennes*, but if the ligular characters were given full power the two genera would be found in a very uncomfortable position in the *Lebiide* series.

It will be observed that the setigerous punctures of the upper surface are reduced almost to the minimum and the supra-orbital setæ are never long, often inconspicuous. In quite a number of specimens which have been examined no thoracic setæ have been observed.

The dissimilarity of the spurs of the hind tibiæ is a character which I do not remember having observed elsewhere in the Carabidæ.

The Graphipterini and Anthiini form together an isolated group of genera with very little affinity with the other groups.

Tribe XXXVII.—**Anthiini.**

Antennæ moderately robust and long, the base free, three basal joints glabrous, third joint as long as the first. Head large sometimes slightly constricted behind the eyes, the neck usually stout, two supra-orbital setigerous punctures. Eyes moderately prominent, oval in the axis of the head, very distant beneath from the mouth, the genæ usually dilated. Clypeus moderately prolonged, truncate or broadly emarginate, a setigerous puncture each side. Labrum large, prominent, convex above anterior margin with four or six setæ. Mandibles usually variable in the sexes, more elongate in the males, arcuate and acute at tip without setigerous puncture on the outer side. Maxillæ relatively slender, hooked at tip, densely ciliate within, the outer lobe biarticulate, the terminal joint a little longer, the palpi rather stout, the terminal joint slightly flattened, broader to tip and truncate. Mentum very deeply emarginate without tooth, the palpi stout the terminal joint much shorter and more slender than the second, this plurisetose in front, ligula variable usually long and dilated in oval form with three short setæ on each side, the paraglossæ short and corneous. Thorax cordiform or somewhat hexagonal and angulate at the sides with a setigerous puncture at the most prominent part of the sides and none at the hind angle. Body subpedunculate, scutellum small. Elytra not margined at base, sides narrowly inflexed, margin entire, no internal plica, apices usually obliquely sinuate, the sutural angle often prominent. Prosternum not prolonged. Mesosternum convex in front, the epimera very narrow. Metasternal epimera distinct, posterior coxæ usually separated, sometimes however but narrowly. Legs moderately long. Tibiæ very feebly spinous and not sulcate on the outer edge, the anterior moderately emarginate on the inner side, the inner spur remote from the apex. Spurs of posterior tibiæ slender and similar. Tarsi usually flattened, the first joint as long as the next three, the fourth more or less emarginate, beneath spinous. Claws long, simple.

The males have three joints of the anterior tarsi moderately dilated and ciliate and spinous beneath.

There are also sexual characters in the mandibles and the thorax is often prolonged behind in two lobes in the males.

The ligula is described as having no paraglossæ, but this is certainly incorrect and these members will be found by dissection as I have figured them (105).

The genera of this tribe occur in Africa. They seem to bear the same relation to the Graphipterini that the Anchonoderini do to the Lebiini.

Closely related to the present and preceding tribes are two genera *Helluodes* and *Physocrotaphus*, which should probably form a distinct tribe to be placed between the Anthiini and Graphipterini. Lacordaire places the former genus in his *Helluonides* (ante p. 160), the latter in the *Morionides* (ante p. 133). I have studied *Helluodes* in nature and

had I sufficient details of the other genus would have defined the tribe as indicated. The structure of the labial palpi is that of the present tribe and the ligula of nearly the same type, the paraglossæ are however more developed.

Tribe XXXVIII.—**Cratocerini.**

Antennæ shorter than the head and thorax, inserted under a slight frontal ridge with however the condyle visible, three basal joints glabrous, 4—11 compressed or somewhat moniliform. Head short, not narrowed behind to a neck, clypeus slightly prolonged and without setigerous punctures, front with the setigerous punctures over the eye extremely indistinct. Eyes moderately prominent, close to the mouth beneath. Labrum short transverse, feebly emarginate and sexsetose in front. Mandibles moderately robust, arcuate, acute at tip. Maxillæ ciliate within, (the inner lobe not hooked in *Basolia*), the outer lobe slender, biarticulate, the palpi rather stout, the last joint oval rather obtuse. Mentum transverse, deeply emarginate and toothed, the lateral lobes obtuse, obliquely truncate, ligula feebly prominent, tip free for a short distance and arcuate, bisetose, paraglossæ semicorneous, not longer than the ligula (spinulose at tip in *Basolia*), and united to the ligula by a translucent membrane, palpi rather slender, the last two joints equal in length the penultimate bisetose in front. Thorax more or less quadrate, not narrowed at base, the setigerous punctures entirely obliterated. Elytra not wider at base than the thorax, sides narrowly inflexed, margin entire, apices truncate or rounded, surface striate, without scutellar stria, dorsal punctures?. Prosternum not prolonged. Mesosternal epimera narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs rather stout, the tibiæ not carinulate, the spurs rather small, the anterior tibiæ dilated at tip, the outer angle rounded, inner side deeply emarginate. Tarsi rather stout, claws simple.

The anterior tarsi of the males have four joints moderately dilated and biserially squamulose beneath.

I regret that I can only imperfectly formulate the characters of this tribe. I know only one specimen of *Basolia nitida* Sol. It may be almost unnecessary to state that the tribe is not the equivalent of Lacordaire's *Cratocerides* which equals nearly the *Dapti* of the present essay. Lacordaire was unfortunate in naming his tribe after a genus entirely unknown to him and which by no means typified his idea of the tribe.

To Baron Chaudoir we are indebted for a proper description of the tribe and an association of genera which seem naturally to belong together, (Ann. Belg. 1872). From my own study I would place these insects not far from the *Lebiide* series, the ligula even being quite suggestive of that idea. I do not perceive a close relationship with the *Morionini* but rather with the *Helluonini*.

The three genera are *Basolia* (= *Catapiesis*), *Cratocerus* and *Brachidiis*, the first two from Brazil, the third from the Philippine Islands. There is nothing allied to them in our fauna.

Tribe XXXIX.—*Orthogonini*.

Antennæ of variable length, more or less compressed beyond the third joint, three basal joints glabrous, inserted under a slight frontal ridge, the condyle however visible. Eyes moderately prominent, close to the mouth beneath. Head short, oval, not constricted, front with two supra-orbital setæ, clypeus moderately prolonged, its front margin subcoriaceous, a setigerous puncture each side. Labrum quadrangular, moderately prominent, apical margin sexsetose. Mandibles slightly prominent, arcuate, acute at tip. Maxillæ usually hooked at tip, (except *Anoncopeucus*), ciliate within and sometimes at tip, the outer lobe slender, palpi moderate in length, last joint subcylindrical or ovate, apex obtuse. Mentum emarginate without tooth, the emargination nearly filled with the basal membrane of ligula, the latter moderately prominent, corneous, 2—6 setose at tip, the paraglossæ large, auriculate, and longer than the ligula, the palpi moderate, the last two joints equal, the penultimate bisetose in front. Thorax broader than long, lateral margin acute, depressed and without setigerous punctures. Elytra oblong usually depressed, base margined, sides narrowly inflexed, margin entire, apex usually truncate sometimes almost rounded, surface striate and with three dorsal punctures, the first on the second interval near the third stria, the posterior two near the second stria. Prosternum not prolonged. Mesosternal epimera narrow. Metasternal epimera distinct, the posterior coxæ contiguous. Legs moderately stout, the tibiæ on the outer edge sulcate and carinulate, the carinæ crenulate and finely spinulose; anterior tibiæ moderately stout, the outer apical angle acute, inner side emarginate, tibial spurs moderate in length. Tarsi moderate in length, the fourth joint emarginate or bilobed, the claws slender, simple or pectinate.

The tarsi on all the feet are dilated in both sexes and are either densely pubescent or densely papillose beneath.

The only species of this tribe that I have been able to procure for dissection is *Orthogonius acrogonus* Wied., in which I find the ligula distinctly free at tip, the paraglossæ large and auriculate extending beyond the ligula and united *behind* the ligula by a thin translucent membrane (108).

It is interesting to find that in this tribe we have a genus with the maxillæ obtuse at tip, a character very irregularly diffused in the Carabidæ.

As indicated above the elytra are variable at tip, being either entire or feebly truncate. Exceptional cases of this kind must be expected in so extensive a family.

In the present tribe the characters seem to indicate an aberrant Truncatipenne with decided Harpalide affinities, *Glyptus* forming a link in the line of affinity. As *Zabrus* seems to be the link between the *Pterostichini* and Harpalini, so *Orthogonius* is between the Truncatipenne complex and the Harpalini.

An interesting essay on this tribe by Baron Chaudoir will be found in the Annales de la Soc. Ent. Belg. xiv, pp. 95—130, in which will be found an expression of opinion very nearly the same as that above.

HARPALINÆ UNISETOSÆ.

This section is not by any means as large as the preceding, the tribes numbering only a third and the genera even less proportionately numerous. The essential character of this section is the presence of but one supra-orbital seta. This carries with it the tendency to a loss of the seta at the hind angle of the thorax, in fact the existence of this seta either at or near the hind angle is more of an exception here than its absence is in the *Harpalinæ bisetosæ*.

The elytral plica exists in some of the tribes here and in about the same proportion as in the preceding section, and it is by this means that we can trace some affinity with *Pterostichini* on the one side or *Lebiini* on the other.

The setigerous puncture on the outer side of the mandible is also observed here in a relatively greater number of tribes but in far fewer genera.

Of the eight tribes which follow six have representation in our fauna, the *Apotomini* and *Peleciini* being absent, while *Zacotini* is peculiar to it.

Mesosternal epimera usually wide, sometimes nearly as large as the episterna, elytra truncate. Mandibles with setigerous puncture. Posterior coxæ often separated, the first ventral segment visible between them.

Tribe XL. *Brachynini*.

Mesosternal epimera very narrow and indistinct, elytra always entire.

Mandibles with setigerous puncture on the outer side. Abdomen pedunculate.

Thorax not margined at the side, its sutures beneath obliterated. Middle and posterior tibiæ emarginate on outer edge at tip. Antennæ with two glabrous joints. Posterior coxæ separated. Labial and maxillary palpi elongate.....Tribe XLI. *Apotomini*.

Thorax margined, sutures distinct. Middle and posterior tibiæ not emarginate. Palpi not long. Posterior coxæ contiguous or but narrowly separated.

Tribe XLII. *Broscini*.

Mandibles without setigerous puncture.

Posterior coxæ distinctly separated.

Body pedunculate. Elytra not margined at base.....Tribe XLIII. *Zacotini*.

Body not pedunculate. Elytra margined at base.....Tribe XLIV. *Peleciini*.

Posterior coxæ contiguous.

Elytral margin more or less interrupted and with an internal plica. Antennæ with three glabrous joints.

Anterior tarsi of male with three, rarely four, joints spongy pubescent beneath. Elytral plica feeble.....Tribe XLV. *Chlæniini*.

Anterior tarsi of male with three joints dilated and squamulose beneath.

Elytral plica strong.....Tribe XLVI. *Zabrini*.

Elytral margin not interrupted, no internal plica. Antennæ with two, rarely with three, glabrous joints. The male tarsi variable.

Tribe XLVII. *Harpalini*.

Tribe XL.—**Brachynini.**

Antennæ slender, the condyle of the basal joint exposed, two basal and a portion of the third joint glabrous. Head gradually narrowed behind the eyes forming a neck, front with one supra-orbital seta, clypeus moderately prolonged. Labrum broad, truncate. Eyes oval, oblique, narrowly separated from the buccal opening. Mandibles stout, feebly arcuate and with a setigerous puncture externally. Maxillæ hooked at tip, ciliate within and at the tip, the outer lobe slender, with equal joints, the palpi moderate, the last two joints more or less pubescent. Mentum moderately broad, emarginate, toothed or not, the ligula in great part membranous, the oval centre corneous and bisetose at tip, the paraglossæ broad, adherent and ciliate at tip, the palpi moderate in length, the second joint longer than the last and plurisetose in front. Thorax with short marginal setæ, no special seta at the hind angle. Scutellum distinct. Elytra not margined at base, narrowly inflexed, margin not interrupted, no internal plica, apex truncate and with a membranous border, disc not striate and without dorsal punctures. Prosternum not prolonged at tip. Mesosternal epimera broad. Metasternal epimera distinct, the posterior coxæ either contiguous or separated. Middle and posterior tibiæ finely ciliate or spinulose externally, the anterior deeply emarginate within, the inner spur at the summit of the emargination. Tarsi slender, the fourth joint feebly emarginate, the anterior of the males with three joints feebly dilated and squamulose beneath.

This is one of the tribes the composition of which seems at present free from differences of opinion. Its position among the other tribes seems, however, far from settled, and I would merely suggest that it be placed after the Graphipterini for want of a better place although its wide mesosternal epimera exclude it, not only from any intimate association with these, but also any of the tribes of the present sub-family excepting the Ozænini and the two adjacent tribes. With the latter it can hardly be said to have much affinity.

The only genus occurring in our fauna is *Brachynus* and to this it is necessary to direct our attention. In the general diagnosis the posterior coxæ are said to be either contiguous or separated. It will be observed in the larger species that many of the specimens have the coxæ plainly contiguous, the smaller species have the coxæ separated and in the case of *carinulatus* rather widely, so that in the present genus a character shrinks into insignificance which in other parts of the series is of the highest importance. This is one of the few instances known to me in the entire Carabide series in which a really important character ceases to have its full value.

On the other hand the apparent increase of the number of the abdominal segments to seven or eight has been exaggerated in value very far beyond its importance. If we examine the species of any of the genera which emit from the anus a liquid whether explosive or not, it will be seen that the structure in no way differs from that of *Brachynus* except that the latter has a broader sixth segment which, being truncate

or slightly emarginate, allows the genital armature to become more plainly visible and we thus count more segments. *Galerita* and any of the larger Dryptini will illustrate the above ideas.

The species of *Brachynus* are found under logs and stones usually in damp situations and often in colonies. Those in our fauna have the head, thorax and legs yellowish, the elytra blue. They have not yet been separated in any satisfactory manner.

Tribe XLI.—*Apotomini*.

Antennæ slender arising under a slight frontal ridge, two basal joints glabrous, third very little longer than the fourth. Head broader behind the eyes, front with one supra-orbital seta, clypeus moderately prolonged. Labrum short, truncate. Eyes oval, not prominent, narrowly separated from the mouth beneath. Mandibles arcuate, acute at tip and with a setigerous puncture externally. Maxillæ hooked at tip, ciliate within, the outer lobe rather slender, biarticulate, the palpi very long and slender, the joints hairy, the last shorter than the preceding and pubescent. Mentum broad, feebly emarginate without tooth, ligula moderately prominent, rounded at tip and with four long setæ, the paraglossæ adherent, a little longer than the ligula and obtuse at tip, the palpi slender, second joint plurisetose in front, last joint a little shorter, slender, acute at tip and hairy. Thorax globular, truncate in front, tubularly prolonged at base, sides not margined, sutures entirely obliterated, sides with but one setigerous puncture at middle, none at hind angle. Body subpedunculate, scutellum very small. Elytra oblong, sides narrowly inflexed, obliquely sinuate near the tip which is somewhat prolonged, no internal plica and no marginal ocellate punctures and no dorsal punctures. Prosternum not prolonged at tip. Mesosternum nearly vertical in front, the coxæ rather widely separated, the epimera narrow and indistinct. Metasternal epimera distinct. Posterior coxæ rather widely separated, the first ventral segment distinctly visible between them. Femora stout, especially the anterior. Tibiæ not ciliate or spinulose, the anterior deeply emarginate within, the inner spur superior, middle and posterior tibiæ obliquely grooved and emarginate at the outer apical angle. Tarsi slender in both sexes, claws simple.

This tribe contains only *Apotomus*, which occurs in Europe, East Indies and Australia. It has been placed near *Bembidium* and *Scarites* by Latreille. Dejean removed it to the Ditomides in which position Lacordaire leaves it. Duval (Genera i, p. 43), recognizing its want of affinity with these, forms of it a distinct tribe which he places between the Clivinities and Ditomites, a line of affinities which seems as unnatural as any that could have been chosen. It seems to me better placed near the Broscini as one of the most sharply defined tribes of the sub-family.

Tribe XLII.—*Broscini*.

Antennæ moderate in length with a variable number (three to five) of basal joints glabrous. Head not constricted but usually gradually broader behind the eyes, front not sulcate, one supra-orbital setigerous puncture and often with a post-orbital cicatrix. Eyes oval, distant beneath from the mouth. Clypeus moderately prolonged with lateral setæ. Labrum moderately prominent, slightly emarginate.

Mandibles arcuate at tip with a setigerous puncture on the outer side. Maxillæ with the inner lobe hooked at tip, ciliate or spinulose within, outer lobe moderately stout, biarticulate, the palpi rather stout, the last joint longer than the third, elongate-oval or fusiform. Mentum broad, deeply emarginate, toothed or not, the ligula moderately prominent, truncate and bisetose at tip, the paraglossæ adherent, sometimes free for a short distance and rarely longer than the ligula, the palpi rather stout, the last joint a little longer than the second, more or less oval in shape, (impressed beneath in *Miscodera*), the second joint bisetose in front. Thorax more or less ovoid, the sides narrowly margined and bisetose, the posterior seta in front of the hind angles. Body pedunculate, scutellum in the peduncle. Elytra not margined at base, sides narrowly inflexed, margin not interrupted posteriorly but with a short internal plica, disc without dorsal punctures. Prosternum obtuse at tip. Mesosternum rather wide, oblique, the epimera narrow. Metasternal epimera distinct, posterior coxæ contiguous or very narrowly separated. Legs moderately stout, the tibiæ not spinulose externally, the anterior moderately dilated at tip, deeply emarginate within, the inner spur at the upper angle of the emargination. The tarsi filiform, fourth joint simple.

The anterior tarsi of the males may have four, three or two joints dilated, their vestiture usually hairs, rarely squamules.

The creation of this tribe under the name of *Cnemacanthides* is due to Lacordaire. *Diectes* has been removed by Schaum (Ins. Deutschl. i, p. 353), to the *Ditomides*, but *Promecognathus* was added, the mistake, however, having been corrected on a subsequent page, (p. 773).

The *Broscini* have a slight sub-ocular ridge at the side of the head. This ridge is well marked in the *Cicindelidæ* but I have not observed it elsewhere in *Carabidæ*.

The latest revision of the tribe is by Putzeys, (Stett. Zeit. 1868, p. 305—379), who recognizes seventeen genera and by the characters given of the first six, some of them might with propriety be removed to form a tribe between the present and the *Harpalini*.

In our fauna we have but one genus represented by two species.

MISCODERA Esch.—In form the species resemble a large *Dyschirius*. The two species are:

M. ARCTICA Payk.—Occurs in northern Europe and in Siberia where it has received the name *erythropus* Mots., crossing to Alaska it becomes *americana* Mann., and it finally reaches Newfoundland under the name *Hardyi* Chaud. It is all one species varying in size and brilliancy of surface in the different localities.

M. INSIGNIS Mann., is altogether different. The anterior half of the thorax is ovate, the basal half prolonged, somewhat like *Promecognathus*. It occurs in Alaska.

I have in the next tribe given my reasons for removing *Zacotus*, and in the same place and in *Peleciini* will be found remarks on the affinities of these two tribes with the present.

Tribe XLIII.—*Zacotini*.

Antennæ filiform arising under a slight frontal margin, first joint stouter, cylindrical, third a little longer than the following, the first four joints glabrous. Head subquadrangular, slightly constricted at a distance behind the eyes, a distinct temporal cicatrix, front with one supra-orbital seta, clypeus slightly prolonged and with the usual setigerous puncture each side. Eyes round, moderately prominent and distant from the buccal fissure beneath. Labrum transverse feebly emarginate, sexsetose in front. Mandibles not prominent, arcuate at tip only, acute and without setigerous puncture externally. Maxillæ ciliate within, hooked at tip, the outer lobe rather stout, biarticulate; palpi stout, the last joint shorter than the preceding, oval and truncate at tip. Mentum transverse, emarginate and acutely toothed, the epilobes acute and prominent; ligula moderately prominent, tip arcuate and free with two setæ, paraglossæ free for a short distance at tip which is acute, shorter than the ligula; palpi moderate, third joint elongate-triangular, slightly arcuate, truncate at tip, the preceding joint shorter and bisetose in front. Thorax ovate, slightly constricted behind, margin distinct, two lateral setæ, one near the middle, one in front of base. Body pedunculate, scutellum not visible. Elytra oblong-oval, humeri rounded, base not margined, sides narrowly inflexed, margin entire not interrupted posteriorly without internal plica. Prosternum not prolonged. Mesosternum obtuse in front, rather widely separating the coxæ, the epimera distinct, broader externally. Metasternum short, body apterous, epimera distinct, posterior coxæ slightly separated. Legs rather slender, middle tibiæ slightly spinulose externally near the tip, anterior tibiæ moderately dilated, emarginate internally, the inner spur at the upper angle of the notch. Tarsi slender, the fourth joint simple.

The males have four joints of the anterior tarsi quadrangularly dilated, the first three with squamiform papillæ beneath, the middle tarsi are not dilated but the first two joints are squamulose beneath.

While I regret the multiplication of tribes I am unwilling to place *Zacotus* either in the Broscini or Peleciini, and must therefore make it the type of a separate tribe.

In size and general appearance (except the head) it resembles *Promecoderus concolor* Germ. The head is subquadrangular, slightly prolonged behind the eyes and then constricted but to a less degree than in *Pelecium*, the front has similar longitudinal depressions but less marked. The body is pedunculate as in the Broscini but the palpi are more nearly those of *Pelecium*. The maxillæ are hooked at tip in *Zacotus* and the Broscini, not hooked in *Pelecium*. The mandibles have no setigerous puncture.

Zacotus seems therefore to form a tribe with nearly equal relations with the Broscini and Peleciini, and to indicate that these two tribes are far more closely allied than any one has yet admitted.

But one species *Z. Matthewsii* Lec., occurs in Washington Territory and Vancouver. I am informed by Mr. Morrison that it lives near small streams in dense woods. It is piceous with bright æneous or cupreous surface lustre.

Tribe XLIV.—*Peleciini*.

Antennæ moderately long, filiform, arising under a distinct frontal ridge, first joint stout, a little longer than the others, 2—11 subequal, the first three joints glabrous. Head quadrangular, suddenly narrowed at a distance behind the eyes to a neck which broadens in a semiglobular manner, front with one supra-orbital seta and with a cicatrix behind the eye, clypeus moderately prolonged and without lateral setigerous punctures. Eyes small, oval, and very distant from the buccal opening. Labrum transverse, concave and emarginate, with six setæ, the outer one on each side vertical and longer, functionally replacing the clypeal seta. Mandibles stout, prominent, decurved, arcuate, acute at tip, without external setigerous puncture. Maxillæ slender not hooked at tip, ciliate within, outer lobe slender, biarticulate, the palpi stout, the outer joints setose, the terminal joint securiform or oval-truncate. Mentum transverse, the lateral lobes obtuse at tip, emarginate with an acute tooth as long as the lateral lobes. Ligula moderately prominent, arcuate or truncate in front and bisetose, the paraglossæ adherent at the sides, free and slender at their tips and ciliate within, palpi stout, terminal joint longer than the second, securiform or oval-truncate, second joint bisetose in front. Thorax margined at the sides and with two setigerous punctures, the posterior distant from the hind angles. Body not pedunculate, scutellum more or less distinct. Elytra more or less distinctly margined at base, the humeri prominent, fifth interval at base often subcarinate, sides narrowly inflexed, margin slightly interrupted posteriorly but with a well marked internal carina, disc without dorsal punctures. Prosternum not prolonged at tip. Mesosternum obtuse in front, the epimera very narrow. Metasternal epimera very indistinctly separated, the posterior coxæ separated rather widely, the first ventral segment visible at middle. Legs moderately robust, the tibiæ not ciliate or spinulose externally, the anterior moderately wide, deeply emarginate internally, the inner spur remote from apex but situated posteriorly. Tarsi not slender, the fourth emarginate or bilobed.

The tarsi of the front and middle legs have four joints dilated and densely pubescent beneath in both sexes, the males have sometimes the middle tibiæ arcuate.

This tribe contains but one genus *Pelecium* Kby., (*Eripus* Dej., *Augasmosomus* Chd.), with the species extending from Mexico to Brazil, all of which are of moderate size, and some (*cyanipes* Kby.), with the elytra recalling the sculpture of our *Dicælus* but more convex. No member of this tribe has been found in our fauna.

Kirby placed the genus between *Cychrus* and *Panagæus* and is followed by others. Dejean while placing it among the Harpalini remarks that it does not well fit there. Lacordaire following Chaudoir places it in a group Stomides which Schaum justly says has no fundamental character and which is in fact the most heterogeneous tribe in Lacordaire's Carabidæ. Schaum, however, while indicating that it must form a separate group, (Berl. Zeitsch. 1860, pp. 128 and 193), writes around the subject leaving us as much in doubt as to its position as before.

I do not believe there can be much doubt of the relationship of the *Peleciini* with the *Broschini* through *Baripus* and *Zacotus*.

It is a singular character that the setæ which are found in the vast majority of Carabidæ, arising either from the middle of the side of the clypeus or from its anterior angle, should be here (I speak especially of *P. cyanipes* Kby.), functionally replaced by the lateral setæ of the labrum, which, instead of being directed to the front in the usual manner, arise vertically and are long. The rather wide separation of the posterior coxæ does not appear to have been noticed. The temporal cicatrix to which Putzeys directs attention (Stett. Zeitsch. 1868, p. 306), is observed in *Pelecium* as well as in Broscini.

Tribe XLV.—Chlæniini.

Antennæ slender, rarely slightly compressed (*Evolenes*) arising under a slight frontal ridge, the three basal joints glabrous. Head not narrowed behind the eyes to a neck, one supra-orbital setigerous puncture. Clypeus more or less prolonged between the mandibles, often without the lateral seta. Eyes oval, moderately prominent, more truncate behind in the Oodes. Labrum transverse, truncate or emarginate, with three, four or six setæ in front. Mandibles feebly arcuate, without setigerous puncture externally. Maxillæ slender, hooked at tip, ciliate or spinous within, the outer lobe usually slender, biarticulate (except *Callistus*), the palpi moderately long, the terminal joint variable in form. Mentum broad, usually emarginate and toothed, sometimes feebly bisinuate in front (*Evolenes*) or even almost truncate (*Brachylobus*), the basal suture always distinct, ligula moderately prominent, usually free at tip and bisetose, the paraglossæ membranous more or less free at tip, longer or not than the ligula, elongate and slender in *Anomoglossus* and ciliate within, palpi moderate in length, the terminal joint variable, the penultimate bi- or plurisetose or even without setæ. Thorax variable in form, the setæ of the margin either slender or entirely wanting. Body not pedunculate, scutellum distinct. Elytra margined at base, sides narrowly inflexed, margin interrupted posteriorly and with a distinct internal plica, surface striate, without dorsal punctures. Prosternum prominent at tip but not prolonged. Mesosternum rather widely separating the coxæ, grooved in front, the epimera narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs moderate, middle and posterior tibiæ finely spinulose externally, the anterior moderately broad, a few stout spines at the outer apical angle, within deeply emarginate the inner spur at the angle of the emargination. Tarsi slender, claws simple.

The males have three or four joints of the anterior tarsi dilated and densely spongy beneath.

After the very able papers by Baron Chaudoir on this tribe (Bull. Mosc. 1856 and 1857; Ann. Mus. Civ. di Genova viii, 1876), it seems entirely unnecessary to enter into any further discussion of the subject. I can not realize the necessity for separating *Callistus* as a distinct tribe but his conclusion concerning *Atranus* seems to me just. *Callistus* affords one of the rare instances in Carabidæ in which the outer maxillary lobe is formed of one piece by the complete fusion of the two which usually exist, without leaving any trace of suture as is the case in *Amerizus*. The mentum of *Brachylobus* (117), is the most complete illustration of

the obliteration of the usual emargination known to me, although the epilobal piece is very distinctly present.

The present tribe is divided into two groups :

Eighth stria of the elytra with its ocellate punctures distant from the margin, the ninth stria very distinct. Eyes regular in outline not truncate behind.

CHLÆNII.

Eighth stria very close to the margin, the ninth indistinct. Eyes truncate behind..... OODES.

In the first group three genera occur in our fauna :

Mentum with distinct lateral lobes.

Toothed in the bottom of the emargination..... **Chlænius.**

Not toothed..... **Anomoglossus.**

Mentum truncate in front..... **Brachylobus.**

In the second group the genera may still be the subject of discussion, those represented in our fauna are recognized by the following characters :

All the tarsi pubescent beneath.

Anterior tarsi ♂ with four joints not widely dilated. Clypeus with a setigerous puncture each side. Labrum 6-setose..... **Lachnocrepis.**

Posterior tarsi not pubescent beneath.

Anterior tarsi ♂ with four joints dilated, the first three spongy beneath.

Clypeus without setigerous punctures. Labrum with six setæ, the four central small and close, the outer large and erect..... **Anatrichis.**

Anterior tarsi ♂ with three joints dilated and spongy.

Second joint of labial palpi without setæ in front..... **Oodes.**

Second joint of labial palpi bisetose in front..... **Evolenes.**

EVOLENES has the antennæ somewhat flattened. The clypeus has a large setigerous puncture each side and the labrum six. It is the only genus in the group in which the second joint of the labial palpi has the setæ so universally observed in the Carabidæ.

OODES as above intended contains *Oodes*, *Stenous* and *Crossocrepis* of Chaudoir. The latter is based on the supposed conformation of the ligula which my own dissections prove not to exist. The other two genera are separated by the mode of dilatation of the anterior tarsi. In *Oodes* proper the clypeus has a setigerous puncture each side and the labrum six in front, in the other two there are no clypeal punctures and three only on the labrum.

The inconstancy of the setigerous punctures in the *Oodes* is remarkable, the only one absolutely present in all is the one over the eye. The entire absence of these punctures from the side of the thorax would be an excellent means of separating the *Chlæni* and *Oodes*, were it not that even in *Chlænius* these punctures although constantly present are often lost in the general punctuation and the seta is small and hair-like and not very evident except in the glabrous species.

It may be observed in *Chlænius* that those species in which the males have not the pubescent space near the tip of the middle tibiæ, that is, those of my division A (*Trans. Am. Ent. Soc.* v, 1876, p. 257), are without setæ on the second joint of the labial palpi, while division B (and *Anomoglossus* with its long second joint) is plurisetose.

Tribe XLVI.—Zabrini.

Antennæ filiform, arising beneath a slight frontal ridge, the three basal joints glabrous. Head short, without distinct neck, one supra-orbital puncture. Clypeus very slightly prolonged, a puncture in each anterior angle. Eyes oval, relatively small, not more convex than the sides of the head, distant beneath from the mouth. Labrum feebly emarginate and plurisetose in front. Mandibles stout, arcuate, more or less obliquely furrowed above, without setigerous puncture externally and feebly bidentate on inner margin. Maxillæ strongly hooked at tip with stiff bristles within, outer lobe biarticulate, palpi stout, third joint longest, fourth oval. Mentum broad deeply emarginate, variably toothed, the ligula moderately prominent, apex free, truncate or bisinuate and bisetose, the paraglossæ obtuse and not longer than it, the palpi moderate, the second joint longer, plurisetose in front, last joint somewhat oval, shorter than the preceding. Thorax broad, as wide as the elytra, a setigerous puncture at the side but none at the hind angle. Body not pedunculate, scutellum distinct. Elytra narrowly inflexed at the sides, the margin interrupted posteriorly and with a well marked internal plica. Prosternum not prolonged. Mesosternum rather wide between the coxæ and broadly concave, the epimera narrow. Metasternal epimera distinct, posterior coxæ contiguous. Legs moderate, middle and posterior tibiæ gradually broader to tip, spinulose externally, the anterior of elongate-triangular form, spinulose at outer apical angle, the inner side obliquely grooved, the inner spur not remote from tip, the terminal spur short, broad, laminate at the sides and suddenly narrower at tip. Tarsi filiform, fourth joint simple.

The males have the first three joints of the anterior tarsi rather widely dilated and biseriately squamulose beneath.

In some species the males have the apices of the middle and posterior tibiæ prolonged on the inner side in a dentiform process. By all European authorities the anterior tibiæ are said to have two spurs at the apex and one above the emargination in the usual position. This statement of the facts of the case seems to me a very loose expression. All Carabidæ have at the tips of the tibiæ two spurs which are in all cases articulated appendages of the tibiæ. These in whatever language used are called by the equivalent of our word "spur." That which makes the so-called smaller terminal spur is merely a dentiform prolongation of the inner apical angle of the tibia which is in all respects the homologue of the apical tooth of the middle and posterior tibiæ of certain males. I am not aware of any coleopterous insect having more than two true tibial spurs and I therefore venture to object to any form of expression conveying a false idea.

It will also be observed that the anterior tibiæ are far less emarginate

than usual in the present series of Carabidæ, and the structure of the inner side may be compared rather to the deep oblique groove already mentioned in some of the earlier tribes.

The opinion expressed by Zimmerman that *Zabrus* should constitute a special tribe seems to me far more nearly correct, than that expressed by Lacordaire, Schaum and others in placing it in the Pterostichini. It is however, as remarked by Bedel, an intermediate tribe between the Pterostichini and Harpalini, with strongly marked characters of each tribe equally present and yet abundantly distinct from either by the structure of the anterior tibiæ. The head and thorax are decidedly Harpalide in structure while the elytra and anterior tarsi are Pterostichide. The mouth parts do not exhibit any more decided relation with the one tribe than the other.

Zabrus belongs to the Circum-Mediterranean fauna extending to the Caspian Sea.

Tribe XLVII.—Harpalini.

Antennæ usually slender arising under a slight frontal ridge, the two basal joints glabrous, sometimes also the greater part of the third. Head often large, usually moderate, not narrowed to a neck, with one supra-orbital seta. Eyes usually moderate in size, never very convex, not distant beneath from the mouth, sometimes however small and distant. Clypeus slightly prolonged between the mandibles, with one or two setigerous punctures near the apical margin. Labrum moderately prominent, truncate or emarginate, plurisetose in front. Mandibles stout, rarely (*Glyptus*) prominent, acute at tip and without setigerous puncture externally. Maxillæ hooked at tip (except in *Glyptus*), although rather feebly in some genera (*Aristus*), the inner margin ciliate, the outer lobe usually slender, as long as the inner lobe but shorter in *Glyptus*, biarticulate, the terminal joint often longer than the first, the palpi moderate, the terminal joint slightly oval or subcylindrical, sometimes slightly pilose. Mentum broad, emarginate, with or without a median tooth which is sometimes as long as the lobes (*Aristus*); ligula prominent, variable in form, the tip free (usually bisetose) and in most cases dilated, the paraglossæ variable in form always as long as, frequently longer than the ligula and very often ciliate at tip, the palpi moderate in length, the terminal joint never longer and very rarely equal to the preceding which is plurisetose except in *Glyptus* where there are no setæ. Thorax variable in form, with a lateral seta but none in the hind angles. Body sometimes subpedunculate, scutellum distinct. Elytra usually margined at base, sides narrowly inflexed, the margin variable but never with an internal plica, surface striate, often densely punctured, either pubescent or glabrous, with or without dorsal punctures. Prosternum not prolonged. Mesosternum separating the coxæ, the epimera very narrow. Metasternal epimera distinct, the posterior coxæ contiguous. Legs variable, often stout and fossorial. The middle and posterior tibiæ often spinulose or even serrulate externally, the anterior with the outer apical angle spinous or prolonged obtusely. The tarsi variable in structure.

Sexual characters variable.

From the great number of genera which have been established on

trivial characters, this tribe has become the most difficult to study of any in the Carabidæ excepting possibly the Lebiini. Characters drawn from the ligula and paraglossæ have here as in the Lebiini been pushed to an extreme, and a study of them from my own dissections proves that in both tribes they have not the great value which has been assigned to them. It seems to me better to reject them almost entirely, certainly as a means of separating tribes or groups and possibly even genera.

The tribe Harpalini as here intended contains the Ditomides of Lacordaire, (Genera i, p. 165), the Cratocerides, Anisodactylides and Harpalides of the same author, and I add also *Glyptus*.

From the Ditomides all authors who have studied it agree that *Apotomus* should be removed. From the Cratocerides *Cyclosomus* should be removed as suggested by Schaum and Chaudoir and placed, as indicated by the latter in the Lebiini, (Bull. Mosc. 1872). *Somoplatus* and *Macracanthus* are allied to *Masoreus*, (Schaum, Berl. Zeits. 1860, p. 178; Chaudoir, Bull. Mosc. 1876, Monog. des Masoreides). After all this dismemberment Chaudoir forms of *Cratocerus*, *Brachidia* and *Basolia* a special group, "plus ou moins voisin des *Drimostoma*." Among the Anisodactylides *Orthogonius* and *Migadops* should be removed, the former constituting a distinct tribe near the Lebiini, the latter being a member of the first sub-family. The Harpalides does not appear to contain any offending material.

To the tribe must be added *Polpochila* (for which however, Lacordaire uses a synonym *Melanotus* Dej.), and *Stenomorphus*, the affinities of the latter having been properly recognized by Schaum.

From my own study I am convinced that *Glyptus* can find no better place than as a group in the present tribe. The genus was described by Brullé who placed it in the Ditomides, a position which does not to me seem so erroneous as Lacordaire intimates. The latter author places it in the most heterogeneous of his tribes (Stomides) near *Idiomorphus* to which it seems not to be greatly allied, although Schaum (Berl. Zeits. 1860, p. 178), says that these two genera are Orthogoniens, while Chaudoir properly omits them from his monograph of that group, (Annales Belg. xiv, 1872). *Idiomorphus* is known to me by the figure which Lacordaire gives and I can therefore express no opinion.

The characters of *Glyptus* are decidedly those of a Harpalide and I think it can very properly be compared with our own *Geopinus*. In both genera it will be observed that the antennæ are rather short and quite distinctly geniculate, the third joint feebly pubescent at tip in *Geopinus* and almost entirely glabrous in *Glyptus*. In both genera

the following joints are pubescent at the edges only the middle being glabrous. The legs are similar, the anterior tibiæ especially so. The mouth parts are also of the same general type observed throughout the Harpalini, especially *Nothopus* and *Piosoma*. It will be observed however that the maxillæ are not hooked at tip although acute, and the outer lobe considerably shorter than the inner, a character which I have not elsewhere found in the Carabidæ. The tarsi are also truly Harpalide, the male having four joints of the anterior and middle pairs dilated and biserially squamulose. Finally, the position of the tactile setæ of the head and thorax show that *Glyptus* must be placed in the present series.

The tribe Harpalini may be divided primarily by the tarsal vestiture of the male into three series one of which may be again divided, the four groups thus formed may be characterized in the following manner:

- Anterior tarsi of male pilose or spinous beneath, usually feebly sometimes not at all dilated.....DAPTI.
- Anterior tarsi of male dilated and biserially squamulose.
 - Maxillæ not hooked at tip, the outer lobe much shorter than the inner, penultimate joint of labial palpi not setose, labrum very short.....GLYPTI.
 - Maxillæ hooked at tip, the outer lobe equal to or longer than the inner, the penultimate joint of labial palpi plurisetose, labrum normal.....HARPALI.
- Anterior tarsi of male densely spongy pubescent beneath.....ANISODACTYLI.

The tarsal vestiture above outlined appears to be the only means yet devised for the division of the tribe. It is not however without exceptions as certain Dapti, *Geopinus* for example have a few squamules on the under side of the anterior tarsi, and certain *Acinopus* have the anterior tarsi feebly dilated and the squamules rudimentary.

Group DAPTI.

The genera of this group present certain special characters which require passing mention. In the majority of the genera the eyes are small and beneath widely separated from the buccal fissure. In *Daptus*, *Polpochila*, *Agonoderus* and *Pogonodaptus* the eyes are normal in form and close to the mouth beneath. The mandibles of *Geopinus*, *Daptus* and *Pogonodaptus* are normally decussating, the left overlapping the right with its tip somewhat chisel-shaped and deeply strigose in the first two genera, acute and not strigose in the third. In all the other genera mentioned below the right mandible appears to be shorter than the left and is capable of being drawn more within the mouth, its chisel-shaped tip passing along the obtuse inner edge of the left reminding me of the manner of the articulation of the lower mandible of the Parrot on the upper or like the incisor teeth of a Rodent.

Daptus has also a small triangular plate over the insertion of the antennæ as observed in *Ditomus*.

On examining the under side of the head the usual setæ may be seen at the middle of the mentum, one on each side and behind the base of the mentum tooth and which may for convenience be called post-dental setæ. In all the genera with one exception there will also be seen two setigerous punctures at the side of the submentum immediately behind the angle of the mentum. In *Polpochila* and *Agonoderus* the two setæ are quite conspicuous, the inner one of each pair, however, larger than the outer, but in the other genera the outer seta gradually becomes more and more feeble so that it finally disappears or can only with great difficulty be found. In *Geopinus* however there is but one seta on each side and this is situated in the posterior angle of the mentum itself.

The anterior tibiæ are usually gradually dilated to apex and spinous at tip externally, but in *Geopinus* the outer angle is expanded in a plate, spinulose on its edge resembling in general form that of *Glyptus*. In *Nothopus* the outer angle is more narrowly prolonged and rather deeply sinuate above the tooth. *Daptus* has a thicker anterior tibia the outer angle rounded, the posterior face rather closely beset with spinules as in *Phaleria*, the fossorial habits of which it imitates.

The following table will enable our genera to be recognized :

Mandibles prominent, decussating. Body subpedunculate.	
Mandibles deeply strigose at tip. Anterior tibiæ decidedly fossorial.	
Eyes small. Mentum with a seta at hind angles.....	Geopinus.
Eyes large. Setæ at sides of submentum.....	Daptus.
Mandibles acute at tip not strigose. Anterior tibia not fossorial. No scutellar stria.	
Head with deep arcuate impression each side.....	Pogonodaptus.
Mandibles not prominent, at most feebly decussating. Body not pedunculate.	
Outer apical angle of anterior tibiæ prolonged.	Nothopus.
Outer apical angle of tibiæ not prolonged.	
Mentum toothed.	
Apical angles of joints 1—3 of anterior tarsi prolonged in spines. Eyes large. Hind angles of thorax obtuse or rounded.....	Polpochila.
Apical angles of joints of anterior tarsi not prolonged. Eyes small. Hind angles of thorax sharply rectangular.....	Cratacanthus.
Mentum not toothed.	
Posterior tarsi with the first joint a little longer than the second, outer edge of middle tibiæ rather flat and with a double row of spinules closely placed.	
Eyes relatively small, distant beneath from the mouth; elytra with numerous dorsal punctures.....	Piosoma.
Eyes relatively large, very narrowly separated from the mouth; elytra with one dorsal puncture.....	Agonoderus.
Posterior tarsi with the first joint nearly as long as the next three.	
Middle tibiæ with the spinules sparsely placed, in the male arcuate and serrate on the inner side.	
Eyes rather small; three series of elytral punctures....	Discoderus.

The sexual characters are not very well marked. The males have four joints of the anterior tarsi feebly dilated (two in *Polpochila*) and rarely (*Discoderus*) with a few squamules beneath. The latter genus has the middle tibiae distinctly arcuate and serrate within. In *Cratacanthus* the right mandible of the male has the basal portion which borders the clypeus more elevated, while the upper edge in front of this is much depressed, a similar structure is observed in *Acinopus*.

The Ditomides of Lacordaire should not in my opinion be widely separated from the present group. The only character in which they differ is in the apex of the ligula being plurisetose. Their punctured surface gives them a somewhat different aspect but this has a parallel in *Dichirus* in the Anisodactyli and *Ophonus* in Harpali.

To this group belong also *Cratognathus* placed by Lacordaire in the Anisodactyli and *Paramecus* of his Harpali.

I have introduced *Daptus* in the above table for convenience of comparison, it does not occur in our fauna. The genera above mentioned differ to a greater or less extent in the form of the ligula and paraglossæ as well as in the extent of pilosity of the terminal joint of the palpi. *Agonoderus* and *Pogonodaptus* are the only genera in which I have observed the penultimate joint of the labial palpi to be bisetose. *Nothopus* and *Piosoma* have the ligula quadrisetose and the paraglossæ ciliate externally at tip, the upper surface is also sparsely setose in these genera. In *Cratacanthus* the paraglossæ are very broad and lie behind the ligula, so that when viewed from the front the entire ligula has very much the appearance of that of a Lebiide.

The name *Pogonodaptus* is proposed for a small species resembling *Daptus* and somewhat also *Pogonus* (Pogonistes), which has the following characters.

POGONODAPTUS n. g.

Head moderately large, horizontal, not narrowed behind the eyes to a neck. Eyes moderately large and prominent, narrowly separated from the mouth. Antennæ arising under a slight frontal ridge, the second joint a little shorter than the third. Clypeus slightly prolonged between the mandibles, narrow, emarginate in front, a seta in each angle. Labrum broadly emarginate, sexsetose. Mandibles prominent, decussating, feebly arcuate, tips acute, a slight tooth at the middle of the right. Mentum broad, feebly emarginate, a short broad tooth at middle. Ligula small, free and bisetose at tip and narrowed, the paraglossæ falciform a little longer than it, the palpi slender, penultimate joint a little longer than the last and bisetose. Maxillary palpi moderate in length, the terminal joint slender, slightly fusiform, a little longer than the preceding. Thorax transverse, narrowed behind, posterior angles distinct. Body pedunculate. Elytra oblong, parallel, very slightly sinuate near the tip, surface striate, without scutellar stria, a dorsal puncture on the third interval near the second stria. Anterior tibiae

not fossorial, the outer edge spinous, middle tibiæ on the outer edge biserially spinulose, the posterior more finely so. Posterior tarsi slender with joints 1—4 gradually decreasing in length.

This genus is known from any in the tribe by its prominent and smooth mandibles, the non-fossorial tibiæ, the absence of scutellar stria, while the form of the ligula and paraglossæ distinguishes it from *Daptus*.

P. piceus n. sp.—Moderately elongate, parallel, piceous, shining, legs pale testaceous. Head smooth, a moderately deep arcuate impression each side. Antennæ piceous, two basal joints pale. Thorax transversely cordate, sides arcuate and narrowing posteriorly, hind angles small moderately prominent, base arcuate, apex very feebly emarginate, disc moderately convex, median line finely impressed, a short intra-angular basal impression, surface smooth, shining. Elytra oblong, parallel, humeri obtuse, surface striate, the striæ entire and not punctate, no scutellar stria, intervals flat, smooth. Body beneath piceous, shining, tip of abdomen paler, surface smooth, impunctate. Length .24 inch; 6 mm.

I have but one specimen, a female, from Texas, given me by Mr. A. S. Fuller.

Group GLYPTI.

I have already given the reasons not only for placing *Glyptus* in the present tribe but also for considering it a group apart. With the exception of the characters which mark it as a special type in the tribe it seems to bear the same relation to the Harpali which follow, that *Geopinus* does to other Dapti. *G. sculptilis* Br., is figured by Lacordaire (Genera, Atlas, pl. 10, fig. 3), in such a position on the plate as to make its comparison with the better figure of *Geopinus* quite easy. The species above cited occurs in western part of Africa and lives in the nests of White Ants. A second species has been described by Chaudoir from Egypt.

Group HARPALI.

It is extremely difficult to draw the line with accuracy between this group and the Dapti, and I am convinced that other characters will be found which will separate the genera but which will not allow the groups to remain as at present constituted.

Not having access to as much exotic material as I desire I cannot venture on a discussion of the genera which should be here included, and will confine my remarks to those of our own fauna.

At the time of the publication of the "Classification of the Coleoptera of North America," by Dr. LeConte, six genera were placed in the Harpali. Since then two have been suppressed *Philodes* (= *Stenolophus*) and *Gynandrotarsus* (= *Anisodactylus*). It is however necessary to add *Stenomorphus*, and *Selenophorus* should be rehabilitated as suggested by Dr. LeConte.

I have already referred to the fact that in by far the larger number of genera of Harpalini the labial palpi have the last joint shorter than the preceding, while the latter is then more than *bi*-setose except in *Glyptus* which seems to have lost the setæ entirely. In the Dapti *Agonoderus* has been referred to as one of the rare exceptions to the rule and the terminal joint is as long or longer than the preceding and the latter simply bisetose in front. The presence of a few hairs more or less may seem a very trivial character, but when this is always associated with another important structural character and is moreover absolutely constant, it assumes an importance far greater than the slight ligular differences which are apt to be described and even figured differently by two equally competent students.

In order that the argument may be followed more easily it will be better to discuss the genera separately, and will call the labial palpi normal when the last joint is short and the preceding plurisetose.

STENOMORPHUS.—Labial palpi normal. Anterior tarsi of male moderately dilated, the first joint nearly equal to the three following and not squamulose beneath, the next three biserially squamulose, the fourth transverse feebly emarginate. Anterior tibiæ ciliate within. Middle femur with a triangular dilatation of the anterior condyle at the knee, the middle tibia slightly arcuate, middle tarsus not dilated. Mandibles chisel-shaped at tip.

The female has the first joint of the anterior tarsi rather broadly dilated and not spongy nor papillose, the tibia is not ciliate within. The middle femur is not toothed at apex, the tibiæ slightly curved.

It will be seen by the above characters that the genus should not be placed with *Anisodactylus* as stated by Schaum, much less with the Pogonini as Lacordaire has done.

GYNANDROPUS.—The labial palpi are normal. The anterior tarsi are moderately dilated in the male, the first four joints biserially squamulose, the first about as long as the next two. The female is as in *Stenomorphus*.

This genus makes a nearer approach to the true Harpali than the preceding.

TRICHOSELAPHUS.—Palpi unknown, probably normal. The anterior tarsi of male with four joints dilated and squamulose beneath, joints 1—4 decreasing gradually in length, the fourth emarginate. Posterior tibiæ arcuate, inner edge crenulate and ciliate. In the female the first four joints are dilated, the first strongly, much longer than any of the following joints, not squamulose or spongy beneath.

This genus occurs in Brazil and is introduced here as it shows some relation with *Discoderus* of the preceding group while plainly a member of the present.

ACINOPUS.—Palpi normal. In both sexes the anterior and middle tarsi are dilated, and in the males biserially squamulose beneath.

In this genus was first observed the difference between the right and left mandible of the male to which I have called attention in *Cratacanthus*. It occurs in Europe and is mentioned as one of the links between the present group and the Dapti.

HARPALUS.—Palpi normal. In the male the anterior and middle tarsi are dilated and biserially squamulose beneath, the fourth joint emarginate or subbilobed. In the female the tarsi are slender. The posterior tarsi have the first joint never longer than the next two. The elytra have one dorsal puncture or none. Paraglossæ ciliate at tip.

SELENOPHORUS.—Palpi normal. Sexual characters of *Harpalus*. First joint of hind tarsus equal to the next three. Elytra with three rows of dorsal punctures. Paraglossæ with at most one cilia at the sides.

A review of the species of our fauna will be found in Proc. Amer. Philos. Soc. 1880, p. 178.

STENOLOPHUS.—Palpi abnormal, the last joint of the labial oval, acuminate, the penultimate bisetose in front. Anterior tarsi of male with four joints dilated and biserially squamulose beneath, the fourth joint deeply bilobed, middle tarsi moderately dilated and squamulose. First joint of hind tarsi about as long as the two following together. The females have the tarsi slender, the fourth joint of the anterior pair emarginate.

In the above genus will be contained those species in our fauna included by Dr. LeConte in his divisions A, B, D, (Proc. Acad. 1868, p. 376). It will be observed that the last joint of the labial palpi is more slender and less oval than in the species of his group C. I have also observed that in some species this same joint is impressed or concave beneath in the male, (*limbalis*, *fuliginosus*, *conjunctus*, *anceps*, *cincticollis*, *flavipes* and *ochropezus*), in others it is entirely simple, (*carbonarius*, *plebejus* and *dissimilis*). Several have not been examined as males are not at hand. In some species also the hind tarsi have a fine carina on the outer side of the first three joints. The middle tarsi are sometimes sulcate as in *Platynus*. I mention these observations that they may be made use of by future students of the genus.

ACUPALPUS.—Palpi abnormal, the terminal joint of the labial rather stoutly oval but slender at tip, the penultimate bisetose in front. Ante-

rior tarsi of male moderately dilated, biserially squamulose beneath, the fourth joint feebly emarginate. Middle tarsi feebly dilated but distinctly squamulose. The first joint of posterior tarsi is distinctly shorter than the next two together. The females have slender tarsi.

Here also may be observed the depression in the last joint of the labial palpi of the male. I was at first inclined to believe that this might be a *post-mortem* character the result of contraction, but its occurrence in males only seems to indicate that it is probably a character found also in life, of a sexual import.

In this genus are contained those species in section C, (loc. cit. p. 377), *hydropicus*, *carus*, *longulus*, *flavilimbus* and *rectangulus*. *Acupalpus* seems fully as worthy of being maintained as many of the genera of the present tribe, if we reject its characters as invalid for generic separation it will be almost impossible to separate genera in the group Harpali.

BRADYCELLUS.—As far as the species in our fauna are concerned this genus is a composite and contains three distinct forms.

First.—Labial palpi normal, the second joint longer than the terminal and plurisetose in front. The anterior and middle tarsi are dilated nearly equally and biserially squamulose beneath, the fourth joint emarginate. The antennæ have the two basal joints glabrous and also a small portion of the base of the third.

I believe the species so constituted should be placed in *Harpalus*, (Lec. Proc. Acad. 1861, p. 374). They are *dichrous*, *vulpeculus* and *autumnalis*.

Second.—Labial palpi abnormal, the second joint bisetose in front not longer than the last. Anterior tarsi of male normally dilated and squamulose beneath, the fourth joint emarginate. Middle tarsi narrowly dilated but distinctly squamulose. The antennæ have three basal joints entirely glabrous.

Here belong *badiipennis*, *atrimedius*, *nigrinus*, and one new species all of which should be referred to the genus TACHYCELLUS Morav.

Baron Chaudoir (Rev. Mag. Zool. 1868), first suggested the placing of these species in *Tachycellus* but the characters made use of were of such a trivial nature that Dr. LeConte did not deem it advisable to follow him. I can not myself agree with Chaudoir in adding also *vulpeculus*, *dichrous* and *autumnalis*.

In the same paper Chaudoir makes the first step toward the re-establishment of *Acupalpus* in our fauna by the description of a new species (*rectangulus*), included in the list above given.

Third.—The remaining species belong to *Bradycellus* proper. The

labial palpi are as in *Tachycellus*. The anterior tarsi above dilated. The middle tarsi about as slender as in the female. The antennæ have at most two basal joints glabrous and the second and often the first are hairy.

From the above notes it will be evident that the genera are not easily separable except both sexes are at hand. The following table will assist the student of our fauna.

Antennæ with two glabrous joints only.

Labial palpi with the terminal joint shorter than the preceding, the latter plurisetose in front.

Anterior tarsi dilated in both sexes. (The first joint only, however, in the female).

Body pedunculate. First joint of anterior tarsus of male not squamulose beneath, the middle tarsi not dilated nor squamulose... **Stenomorphus**.

Body not pedunculate. First four joints of anterior and also of the middle tarsi squamulose beneath..... **Gynandropus**.

Anterior tarsi dilated in the male only.

First joint of hind tarsus not longer than the two following, elytra with at most one dorsal puncture..... **Harpalus**.

First joint of hind tarsus equal to the next three, elytra with three series of dorsal punctures..... **Selenophorus**.

Labial palpi with the terminal joint equal to or even a little longer than the preceding which is bisetose only.

Penultimate joint of anterior and middle tarsi of male bilobed, the middle tarsi dilated..... **Stenolophus**.

Penultimate joint simply emarginate, the middle tarsi not or very feebly dilated.

Mentum not toothed..... **Acupalpus**.

Mentum toothed..... **Bradycellus**.

Antennæ with three glabrous joints.

Thorax without setigerous puncture in hind angle.

Mentum toothed..... **Tachycellus**.

Thorax with setigerous puncture in hind angle. A small mentum tooth.

Middle tarsi simple, not dilated in male..... **Dichirotrichus**.

Middle tarsi dilated in male. Inner angle of anterior tibiæ prolonged in a spine..... **Diachromus**.

The last two genera do not occur in our fauna and are introduced in the table for convenience of comparison. I observe that the three basal joints are glabrous, that is, the third joint is not punctured and pubescent in the manner of the following joints. It has it is true a few hairs but the surface is like the second and not the fourth. In these genera the hind angle of the thorax bears a long erect seta, presenting the only instance in which this is the case in genera with one supra-orbital seta. Duval refers these genera to the *Anisodactyli*, but from the tarsal vestiture they seem more properly to belong here.

As already remarked three species formerly placed in *Bradycellus*

are included in *Harpalus*. The mouth parts of *vulpeculus* 139, show some difference from those figured as *Harpalus*, but the other two species have the ligula and paraglossæ as in fig. 138, except that the paraglossæ are not ciliate.

Group ANISODACTYLI.

The essential character of this group is that the dilated tarsal joints of the male are spongy pubescent beneath.

As constituted by Lacordaire it contains very diverse forms—*Orthogonius* is a distinct tribe, *Cratognathus* and *Piosoma* are Dapti, *Geobænus* allied to *Platynus*; *Migadops*, *Loxomerus* and *Brachycælus* are Carabinæ, *Gynandropus* and *Diachromus* go to the Harpali; *Gynandrotarsus* has already been suppressed in *Anisodactylus*, and I hope to show good reasons for doing the same with *Gynandromorphus*.

The genus *Anisodactylus* not only gives its name to the group but is also its central idea. From this as a starting point the relative values of the genera may be discussed, as a convenient point of comparison.

In a review of our species of the genus published by me, (Proc. Am. Philos. Soc. 1880, p. 162, etc.), will be found a full discussion of the characters which serve to divide the species in subgenera and lower groups—the trifid anterior tibial spur, the spur broader at middle and the slender spur. In two species *harpaloides* and *opaculus*, the first joint of the anterior tarsus of the female is dilated and in the former that joint is somewhat prolonged under the second.

Gynandromorphus has the trifid anterior tibial spur in both sexes, the first joint of the anterior tarsi dilated in the female while the posterior tarsi are somewhat flattened and pilose above. In the first character it is equally related to the *Dichirus* and *Tripectrus* groups of *Anisodactylus*, by the second to the latter more especially and by the third character to the former more especially. The upper surface is densely and rather coarsely punctured and finely pubescent. I have therefore no hesitation in placing *Gynandromorphus* as a division of *Anisodactylus* intermediate between the groups *Dichirus* and *Tripectrus*.

XESTONOTUS.—Anterior tarsi broadly dilated in the male, the first four joints densely spongy pubescent beneath, middle tarsi with four joints less widely dilated and spongy pubescent beneath, the first entirely glabrous, posterior tarsi slender and long. Elytra with one dorsal puncture. The ligula is rather narrow and parallel, the paraglossæ broad and a little longer than it.

Comparing the differences between the ligula and paraglossæ with those observed in *Harpalus* there does not seem any valid reason for

retaining the genus apart from *Anisodactylus*, and the species will find a suitable position between the *amaroides* and *sericeus* groups of that genus.

AMPHASIA.—Here the characters are essentially those of *Anisodactylus sericeus*. The paraglossæ are similar in form to *Anisodactylus* and merely a little longer.

ANISOTARSUS.—The sexual characters and those derived from the posterior tarsi are precisely those of *Anisodactylus cœnus* and *lætus*. The paraglossæ are a little broader than in typical *Anisodactyli*.

SPONGOPUS.—The ligula and paraglossæ are intermediate in structure between the typical *Anisodactylus* and *Xestonotus*, and the ligula is free for a greater distance at tip. The sexual characters are those of the *amaroides* group. The posterior tarsi are however slender. The elytra being punctulate and with a single dorsal puncture this species forms an intermediate between the *discoideus* group and *sericeus*.

From the above remarks it must be evident that my opinion is that the above genera are inseparable from *Anisodactylus*. I have examined the species from every possible standpoint and can find no reason either from my own studies or the remarks of others to do otherwise than suggested above.

While I have given these genera all the study possible with me at present, I consider the question of the total suppression of *Anisotarsus* and *Spongopus* still open for further discussion, there is no doubt in my mind, however, regarding *Gyuandromorphus*, *Xestonotus* and *Amphasia*.

It is worthy of note in *Anisodactylus* that we may have more than one setigerous puncture at each angle of the clypeus while in most Carabidæ there is but one and even this may be lost.

Sub-Family PSEUDOMORPHINÆ.

Middle coxal cavities enclosed by the central pieces of the meso- and metasternum. Head without supra-orbital setæ and with grooves beneath of variable extent for the reception of the antennæ. Eyes in great part superior, very widely separated beneath from the mouth. Legs short, contractile, tarsi slender, rigid.

The genera which compose the present division are the most abnormal of all Carabidæ. That they belong to the family and should not be separated is I believe now generally admitted, the only difficulty being their proper position in the series, and from my own study they do not seem to be well placed anywhere and are equally aberrant in any

position. The affinity so often mentioned in the direction of the Gyrinidæ seems rather feeble, and is expressed rather in an outward resemblance of form than in the more important anatomical details.

There seems to be an undiscovered form or possibly a lost type to which certain tribes of the Carabinæ and Harpalinæ as well as Amphizoidæ appear to point, and it is with this hypothetical centre that the Pseudomorphinæ seem to be allied. The tribes referred to are Enceladini, Siagonini and Ozænini. In the discussion of the Gyrinidæ there will be found important reasons why we cannot suspect any relation between it and the present sub-family.

One tribe alone forms the sub-family.

Tribe XLVIII. **Pseudomorphini.**

Antennæ usually slender, filiform, compressed and subserrate in *Adelotopus* arising under a moderately dilated frontal plate, the three basal joints glabrous, received in repose in grooves of greater or less length, within the eyes beneath the head. Head short, obtuse, deeply inserted in the thorax, sides of front more or less dilated and infringing on the eyes in front, clypeal suture rarely visible, front without supra-orbital setæ. Eyes oval, not prominent, usually confined almost entirely to the upper side of head and widely distant from the buccal fissure beneath. Labrum short, transverse, rounded in front and feebly sexsetose. Mandibles short, broad, arcuate externally, sometimes slightly toothed within. Maxillæ slender, ciliate and spinous within, not strongly hooked at tip, the outer lobe slender, biarticulate with the terminal joint longer, the palpi short and thick, the terminal joint cylindrical, compressed, obliquely truncate at tip. Mentum large without basal suture, deeply emarginate toothed or not, the epilobes narrow, ligula and paraglossæ variable in form, the palpi longer than the maxillary, the terminal joint cylindrical and obliquely truncate or securiform. Thorax as broad at base as the elytra and overlapping them, the lateral margin more or less explanate and often fimbriate but without the usual setæ. Elytra oblong, truncate at tip, not margined at base, lateral margin acute, sides narrowly inflexed but more widely near the base, the epipleuræ proper very narrow, no internal plica, surface at most obsoletely striate without dorsal punctures. Scutellum distinct. Prosternum narrow usually somewhat prolonged behind the coxæ, the coxal cavities very narrowly closed behind. Mesosternum very narrow between the coxæ, the epimera distinct, not reaching the coxal cavity. Metasternal epimera distinct, posterior coxæ contiguous. Legs short not visible beyond the elytra, the femora stout, rather deeply channeled beneath and receiving the tibiæ, the latter slender and with moderate terminal spurs, the anterior tibiæ emarginate within, the inner spur remote from the apex. Tarsi slender very feebly flexible, the claws slender, feebly arcuate and simple.

This tribe is represented in our fauna by the genus *Pseudomorpha* with three species.

In the two specimens of *P. Cronkhitei* before me the fourth and fifth ventral segments have at middle a short, transverse, pilose band, while *P. Behrensii* my unique presents no such character. This may be sexual. I have observed no other sexual differences.

Our species are so rare that it was impossible to procure one for dissection, and I have substituted *Sphallomorpha quadrisignata* Cast., from Australia, (see Pl. III, fig. 4, also dissection 147).

ADDITIONAL NOTES.

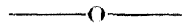
On p. 93 I have made use of the expression that "the (posterior) coxæ reach the side margin of the body, separating the metasternal side pieces from the first ventral segment." By this I mean to be understood, the side margin as it appears from the examination of an entire specimen, the limit of the body being the margin of the elytra. The extent of the coxæ outwardly is such that the side pieces become more dorsal, they are never cut off from articulation with the abdomen but merely hidden. It is not a question of greater or less inflexion of the elytral margin, as it will be observed in those genera with most widely inflexed elytra (*Cychrus* et al.), that the coxæ do not attain the side margin of the body.

From the families of Adephaga given on p. 94 there appears to be a tendency on the part of some able entomologists to exclude the GYRINIDÆ. I believe I have studied this type with some care and the structure of the external skeleton as well as the mouth parts seem to me so plainly Adephagous as to leave no room for doubt. It is true the antennæ are irregular in their form, the eyes are so broadly divided as to make a superior and inferior pair on each side, and in *Dineutus* the outer or palpar lobe of the maxilla is lost. These are certainly important characters but must not be allowed to outweigh all the rest of the organization. The Adephaga do not present an unbroken chain and in its fragmentary condition some aberration must be expected.

After entering on the description of the various tribes recognized in the preceding pages, I have used Lacordaire's first volume of the Genera as a convenient means of comparison. It is well known that this volume although not old in years is somewhat antiquated through the researches of Schaum, Chaudoir and LeConte, but with all its defects it is the only general system of Carabidæ extant. Several authors have started in an attempt to revise the system but beyond the arrangement of the genera of local faunæ nothing has been done. It has been easy enough as far as the tribes of the CARABINÆ extend, beyond this all is in confusion. The present essay aims to go a step farther and if but little has been

accomplished, it is hoped that discussion will clear up much of the obscurity and bring some order from the existing chaos.

All of Lacordaire's tribes will be found to have been reviewed, and from among the genera I have endeavored to select for special study those about which he or others appeared to be in greatest doubt. The judgment on the choice of genera must be left to the criticism of all who choose to find out which they are by a perusal of the preceding pages or a reference to the index.

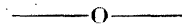


That section of the genus *Cychrus* known as *Sphæroderus* has been supposed to be peculiar to the eastern portion of the Atlantic region, no species having heretofore been found west of the Mississippi River. Within a few days a species has been received from Washington Territory. I give the description here as an interesting contribution to geographical distribution.

Cychrus* (*Sphæroderus*) *relictus n. sp.—Form slender, black, shining. Head smooth. Thorax cordiform, one-fourth broader than long, sides arcuate in front, oblique behind, base not broader than apex and one-third shorter than the length, hind angles slightly obtuse, margin very narrowly reflexed, apical arcuate line and basal transverse line moderately deeply impressed, median line less deeply, the intra-angular impressions rather deep and curved in front toward the median line, disc very little convex, surface smooth, slightly wrinkled posteriorly. Elytra very regularly elliptical, twice as wide at middle as the thorax and a little more than one-half longer than their width, margin very narrowly reflexed, surface with a slight violet tinge with numerous rows of moderately deeply impressed punctures, the striæ irregular. Body beneath smooth, shining. Length .68 inch; 17 mm.

This species is more elongate than any of our eastern *Sphæroderus*, and differs also in the absence of any punctuation at the base of the thorax and by the sculpture of the elytra. The legs are also more slender and longer than in the other species. The general aspect of the insect is that of a *Sphæroderus* imitating *Cychrus striatopunctatus*.

One male collected at Spokane, Wash. Terr. by Mr. L. E. Ricksecker.



To the Clivinæ belongs the European genus *Reicheia* Saulcy, remarkable as the only known member of the Carabinæ with the eyes so reduced as to be with difficulty observed. The species is extremely small (.06 inch) even for a member of the tribe to which it belongs. Synonymous with this genus is *Spelæodytes* Mill. A figure of *R. lucifuga* is given by Saulcy, Ann. Ent. Soc. Fr. 1862, pl. viii, fig. 5, from which it seems allied to *Clivina* rather than *Dyschirius*.

In the *Bullet. Ent. Soc. Fr.* 1881, No. 17, p. 148, M. Abeille de Perrin presents a good argument for the union of *Trechus* and *Anophthalmus*. The series of species in our fauna is too small for me to express any opinion, but from the ability shown by M. Abeille in more difficult observations I have no doubt he is entirely correct.

While I would be willing to accept the idea above indicated I am not prepared to coincide with those who would unite *Anillus* with *Bembidium* on the ground that these bear the same relation to each other that *Trechus* and *Anophthalmus* do. Through the kindness of Dr. Dohrn I have been enabled to study *Scotodipnus* (*Microtyphlus*), and as it did not appear to present anything of special moment for a general essay, its closer examination was deferred until the present time. The upper surface presents no peculiarities of moment except that I do not find the elytra truncate as stated by Linder, (*Ann. Ent. Soc. Fr.* 1863, p. 483, pl. ix, fig. 7). The usual setæ of the Bembidiini are present and that on the mandible well marked. On examining the under side, which I had omitted to do at first, I was surprised to find the *posterior coxæ rather widely separated*. In *Anillus* the same character exists, while in *Anophthalmus* the posterior coxæ are contiguous as in ordinary *Trechus*. This structure is certainly a valid generic difference and whatever course is taken with *Anophthalmus* the other two genera must remain. Notwithstanding the small size of *Scotodipnus* I have observed the internal elytral plica of the Bembidiini, feeble of course, but quite as distinct as in some *Tachys*.

In my "Synopsis of the Silphidæ," (*Trans. Am. Ent. Soc.* 1880), I have directed attention to the fact that all the eyeless genera have the posterior coxæ separated, but I am not able to explain the correlation of these distant members of the body.

—O—

CORRECTIONS.

Page 103, line 14 from bottom, for "exceptions" read "exception."

Page 110, line 4 from bottom, omit the words "if not all."

Page 130, on the first line of larger type, after "represented" add "in our fauna."

Page 142, in the first synoptic table, for "Perigoni" read "Perigonæ."

Page 144, line 10 from top, for "striated" read "situated."

Page 161, line 18 from bottom, for "narrower" read "narrow."

Page 165, line 16 from top, for "six" read "five," and add *Zabrin* after *Apotomini*, (in next line).

Page 176, line 9 from top, for "position" read "positions."

Index of Families, Sub-Families, Tribes and Genera.

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EXPLANATION OF PLATE III.

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- Fig. 1.—Under side of *Cychrus alternatus* Motsch.
Fig. 2.—“ *Pterostichus validus* Dej.
Fig. 3.—“ *Mormolyce phyllodes** Hagenb.
Fig. 4.—“ *Sphallomorpha quadrisignata** Cast.
Fig. 5.—“ *Haliphus triopsis* Say.
Fig. 6.—“ *Amphizoa insolens* Lec.
Fig. 7.—“ *Pelobius Hermannii** Fab.
Fig. 8.—“ *Dytiscus confluens* Say.
Fig. 9.—“ *Dineutus discolor* Aubé.
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EXPLANATION OF PLATE IV.

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- Fig. 1.—*Psydrus piceus* Lec.
Fig. 2.—*Nemotarsus elegans* Lec.
Fig. 3.—*Euproctus trivittatus* Lec.
Fig. 4.—*Onota Floridana* Horn.
Fig. 5.—*Eucærus varicornis* Lec.
Fig. 6.—*Pentagonica pallipes* Lec.
Fig. 7.—*Zacotus Matthewsii* Lec.
Fig. 8.—*Pogonodaptus piceus* Horn.
Fig. 9.—*Evolenes exaratus* Dej.
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* The asterisk affixed to names indicates that the genus does not occur in our fauna. Occasionally foreign species have been used when ours is too rare to dissect, as in Nos. 7, 33, 127, of the following plates.

EXPLANATION OF PLATE V.

This and the following plates consist of the mentum and appendages and maxilla of the various genera and species mentioned with a few under bodies. The numbering is continuous for easy reference in the text.

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|--|--|
| 1.— <i>Omophron dentatum</i> Lec. | 14.— <i>Metrius contractus</i> Esch. |
| 2.— body beneath. | 15.— body beneath. |
| 3.— <i>Elaphrus fuliginosus</i> Say. | 16.— <i>Migadops virescens</i> * Waterh. |
| 4.— <i>Blethisa oregonensis</i> Lec. | 17.— <i>Mystropomus subcostatus</i> * Chaud. |
| 5.— <i>Diachila arctica</i> Gyll. | 18.— <i>Promecognathus lævissimus</i> Dej. |
| 6.— <i>Notiophilus semistriatus</i> Say. | 19.— <i>Pasimachus elongatus</i> Lec. |
| 7.— <i>Pelophila borealis</i> Payk. | 20.— <i>Scarites subterraneus</i> Fab. |
| 8.— <i>Opisthius Richardsonii</i> Kby. | 21.— <i>Dyschirius sphaericollis</i> Say. |
| 9.— <i>Leistus ferruginosus</i> Mann. | 22.— <i>Clivina bipustulata</i> Fab. |
| 10.— <i>Nebria Mannerheimii</i> Fisch. | 23.— <i>Schizogenius lineolatus</i> Say. |
| 11.— <i>Loricera californica</i> Lec. | 24.— <i>Aspidoglossa subangulata</i> Chaud. |
| 12.— <i>Cychnus angusticollis</i> Fisch. | 25.— <i>Ardistomis viridis</i> Say. |
| 13.— <i>Carabus tædatus</i> Fab. | |

EXPLANATION OF PLATE VI.

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|--|---|
| 26.— <i>Enceladus gigas</i> * Bonelli. | 39.— <i>Patrobus californicus</i> Motsch. |
| 27.— <i>Trachypachys inermis</i> Motsch. | 40.— <i>Anophthalmus Tellkampfi</i> Erichs. |
| 28.— body beneath. | 41.— <i>Trechus ovipennis</i> Motsch. |
| 29.— <i>Panagæus crucigerus</i> Say. | 42.— <i>Oopterus Maceyi</i> * Bates. |
| 30.— <i>Psydrus piceus</i> Lec. | 43.— <i>Morio monilicornis</i> Latr. |
| 31.— <i>Siagona Europæa</i> * Dej. | 44.— body beneath. |
| 32.— body beneath. | 45.— <i>Stomis pumicatus</i> * Panz. |
| 33.— <i>Pachyteles mexicanus</i> Chaud. | 46.— <i>Pterostichus Hamiltoni</i> Horn. |
| 34.— body beneath. | 47.— <i>Lophoglossus scrutator</i> Lec. |
| 35.— <i>Nomius pygmæus</i> Dej. | 48.— <i>Holciophorus ater</i> Dej. |
| 36.— <i>Bembidium Mannerheimii</i> Lec. | 49.— <i>Piesmus submarginatus</i> Say. |
| 37.— " n. sp. | 50.— <i>Evarthrus sodalis</i> Lec. |
| 38.— <i>Amerizus oblongulus</i> Mann. | |

EXPLANATION OF PLATE VII.

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| 51.— <i>Myas coracinus</i> Say. | 64.— <i>Olisthopus parmatius</i> Say. |
| 52.— <i>Amara obesa</i> Say. | 65.— <i>Lestignathus Simsoni</i> * Bates. |
| 53.— <i>Loxandrus rectus</i> Say. | 66.— <i>Anchonoderus quadrinotatus</i> Horn. |
| 54.— <i>Dicælus elongatus</i> Dej. | 67.— <i>Atranus pubescens</i> Dej. |
| 55.— <i>Diplochila laticollis</i> Lec. | 68.— <i>Lachnophorus elegantulus</i> Mann. |
| 56.— <i>Dicrochile Goryi</i> * Bdv. | 69.— <i>Leptotrachelus dorsalis</i> Fab. |
| 57.— <i>Badister pulchellus</i> Lec. | 70.— <i>Trigonodactyla terminata</i> * Dej. |
| 58.— <i>Zargus Schaumii</i> * Woll. | 71.— <i>Casnonia pensylvanica</i> Linn. |
| 59.— <i>Platynus brunneomarginatus</i> Mann. | 72.— <i>Galerita janus</i> Fab. |
| 60.— <i>Calathus ruficollis</i> Dej. | 73.— <i>Zuphium mexicanum</i> Chaud. |
| 61.— <i>Pristodactyla dubia</i> Lec. | 74.— <i>Thalpius Hornii</i> Chaud. |
| 62.— <i>Masoreus Wetterhali</i> * Gyll. | 75.— <i>Trichognathus marginipennis</i> * Latr. |
| 63.— <i>Perigona nigriceps</i> Dej. | |
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EXPLANATION OF PLATE VIII.

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| 76.— <i>Drypta dentata</i> * Rossi. | 89.— <i>Blechrus nigrinus</i> Mann. |
| 77.— <i>Mormolyce phyllodes</i> * Hagenb. | 90.— <i>Axinopalpus californicus</i> Mots. |
| 78.— <i>Agra cancellata</i> * Dej. | 91.— <i>Tecnophilus nigricollis</i> Lec. |
| 79.— <i>Ega Sallei</i> Chevr. | 92.— <i>Euproctus trivittatus</i> Lec. |
| 80.— <i>Tetragonoderus fasciatus</i> Hald. | 93.— <i>Callida</i> n. sp. |
| 81.— <i>Nemotarsus elegans</i> Lec. | 94.— <i>Callida punctata</i> Lec. |
| 82.— <i>Loxopeza grandis</i> Hentz. | 95.— <i>Philophuga amoena</i> Lec. |
| 83.— <i>Aphelogenia furcata</i> Lec. | 96.— <i>Plochionus pallens</i> Fab. |
| 84.— <i>Coptodera ærata</i> Dej. | 97.— <i>Pinacodera limbata</i> Dej. |
| 85.— <i>Phlæoxena signata</i> Dej. | 98.— <i>Cymandis americana</i> Dej. |
| 86.— <i>Dromius piceus</i> Dej. | 99.— <i>Apenes lucidula</i> Dej. |
| 87.— <i>Apristus subsulcatus</i> Dej. | 100.— <i>Eucærus varicornis</i> Lec. |
| 88.— <i>Metabletus americanus</i> Dej. | |

EXPLANATION OF PLATE IX.

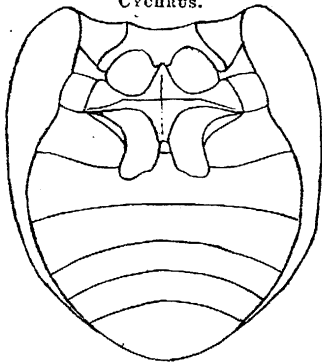
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|---|--|
| 101.— <i>Pentagonica pallipes</i> Lec. | 114.— <i>Promecoderus concolor</i> * Germ. |
| 102.— <i>Onota Floridana</i> Horn. | 115.— <i>Chlaenius pensylvanicus</i> Say. |
| 103.— <i>Helluomorpha ferruginea</i> Lec. | 116.— <i>Anomoglossus emarginatus</i> Say. |
| 104.— <i>Polystichus fasciolatus</i> * Rossi. | 117.— <i>Brachylobus lithophilus</i> Say. |
| 105.— <i>Anthia sexmaculata</i> * Fab. | 118.— <i>Callistus lunatus</i> * Fab. |
| 106.— <i>Graphipterus variegatus</i> * Fab. | 119.— <i>Lachnocrepis parallela</i> Say. |
| 107.— <i>Basolia brasiliensis</i> * Gray. | 120.— <i>Anatrichis minuta</i> Dej. |
| 108.— <i>Orthogonius acrogonus</i> * Wied. | 121.— <i>Oodes amaroides</i> Dej. |
| 109.— <i>Brachynus fumans</i> Fab. | 122.— <i>Evolenes exaratus</i> Dej. |
| 110.— <i>Apotomus rufus</i> * Rossi. | 123.— <i>Zabrus aurichalceus</i> * Adams. |
| 111.— <i>Pelecium cyanipes</i> * Kirby. | 124.— <i>Geopinus incrassatus</i> Dej. |
| 112.— <i>Zacotus Matthewsii</i> Lec. | 125.— <i>Pogonodaptus piceus</i> Horn. |
| 113.— <i>Miscodera arctica</i> Payk. | 126.— <i>Nothopus zabroides</i> Lec. |
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EXPLANATION OF PLATE X.

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|---|---|
| 127.— <i>Polpochile flavipes</i> Dej. | 140.— <i>Selenophorus palliatus</i> Fab. |
| 128.— <i>Cratacanthus dubius</i> Beauv. | 141.— <i>Tachycellus</i> n. sp. |
| 129.— <i>Piosoma setosum</i> Lec. | 142.— <i>Anisodactylus piceus</i> Mön. |
| 130.— <i>Discoderus americanus</i> Mots. | 143.— <i>Anisotarsus terminatus</i> Say. |
| 131.— <i>Agonoderus pallipes</i> Fab. | 144.— <i>Xestonotus lugubris</i> Dej. |
| 132.— <i>Aristus capito</i> * Dej. | 145.— <i>Amphasia interstitialis</i> Say. |
| 133.— <i>Glyptus sculptilis</i> * Brullé. | 146.— <i>Spongopus verticalis</i> Lec. |
| 134.— <i>Stenomorphus rufipes</i> Lec. | 147.— <i>Sphallomorpha quadrisignata</i> * Cst. |
| 135.— <i>Gynandropus hylacis</i> Say. | 148.— <i>Amphizoa insolens</i> Lec. |
| 136.— <i>Stenolophus limbalis</i> Lec. | 149.— <i>Pelobius Hermannii</i> * Fab. |
| 137.— <i>Harpalus oblitus</i> Lec. | 150.— <i>Gyrinus analis</i> Say. |
| 138.— <i>Harpalus</i> n. sp. | 151.— <i>Dineutus discolor</i> Aubé. |
| 139.— <i>H.</i> (<i>Bradycellus</i>) <i>vulpeculus</i> Say. | |

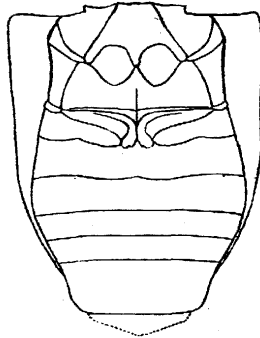
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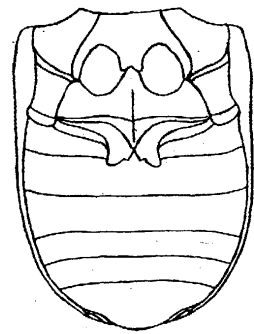
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SPHALLOMORPHA.



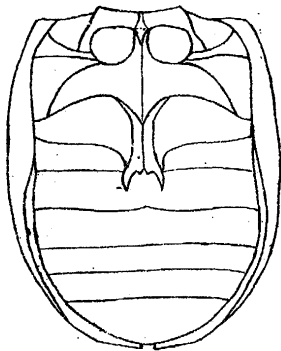
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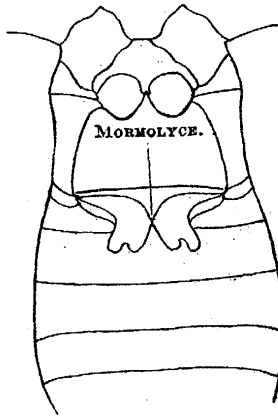
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DYTISCUS.



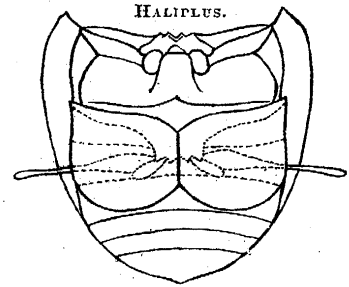
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MORMOLYCE.



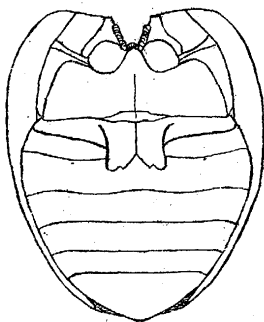
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HALIPLUS.



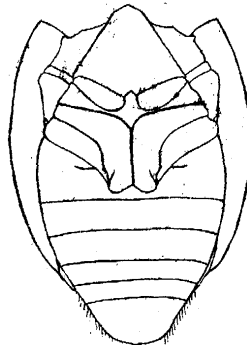
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AMPHIZOA.



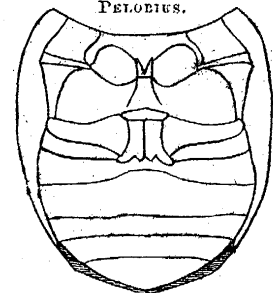
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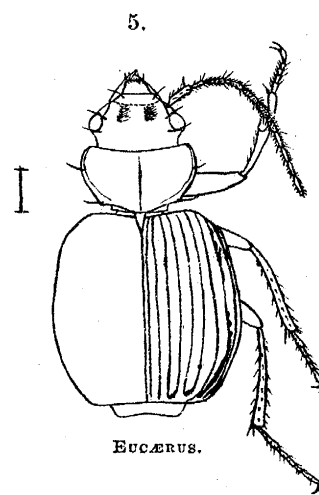
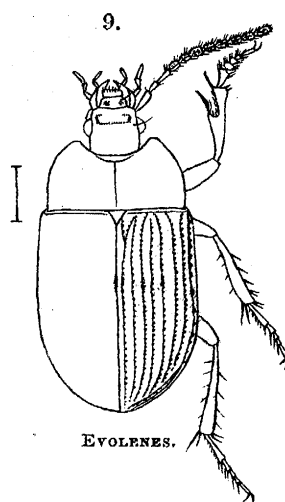
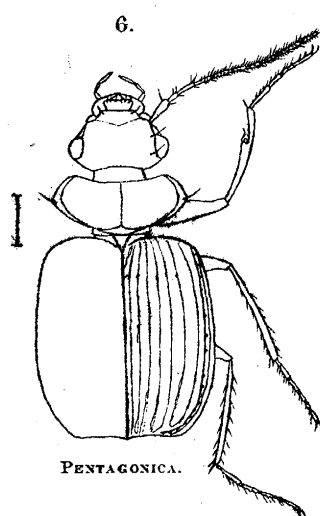
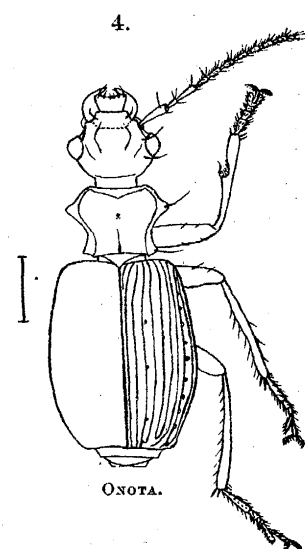
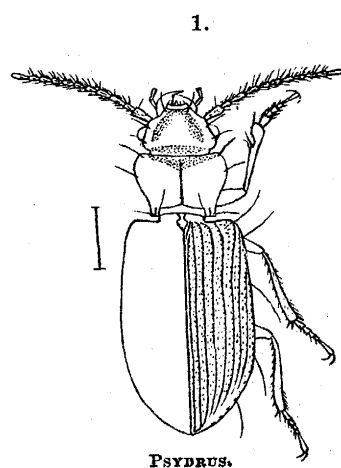
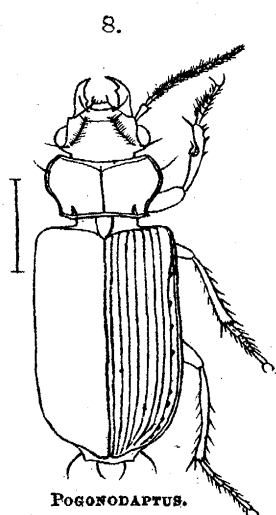
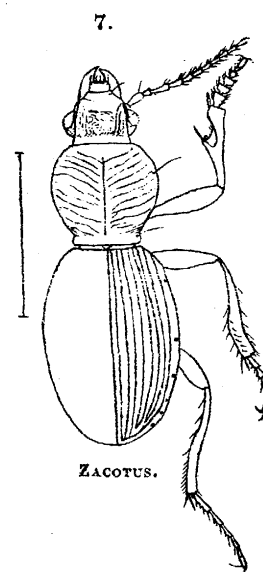
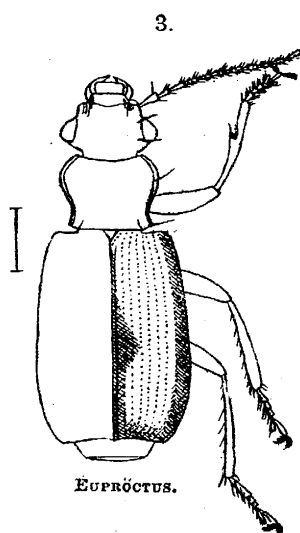
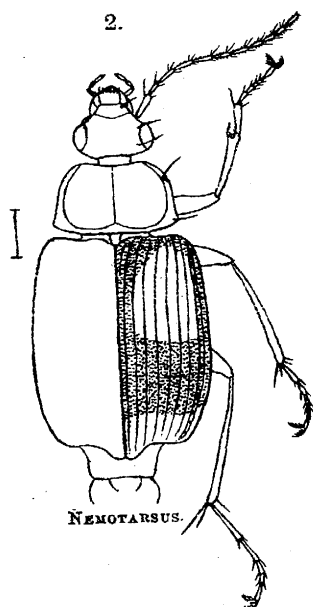
DINEUTUS.



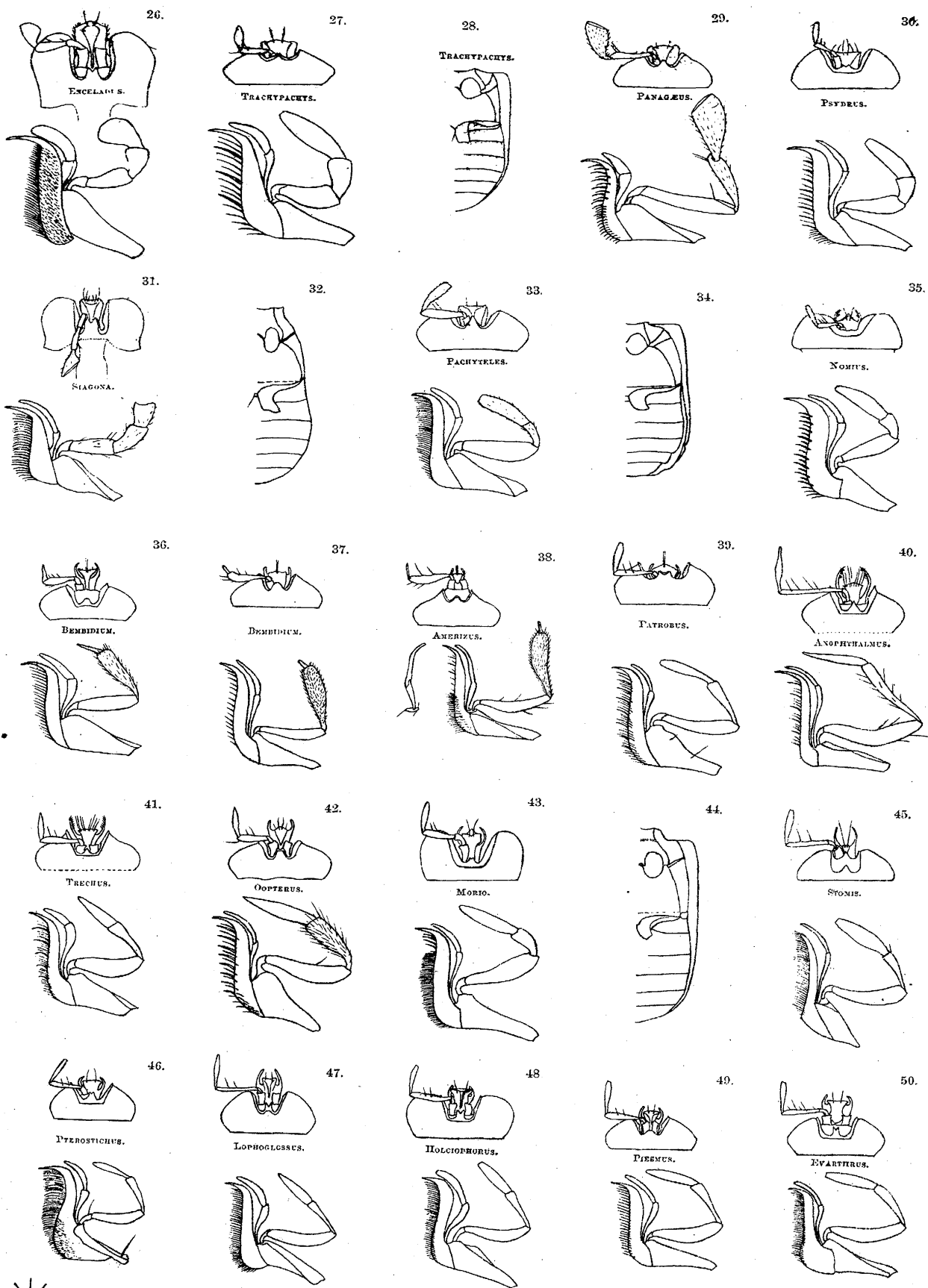
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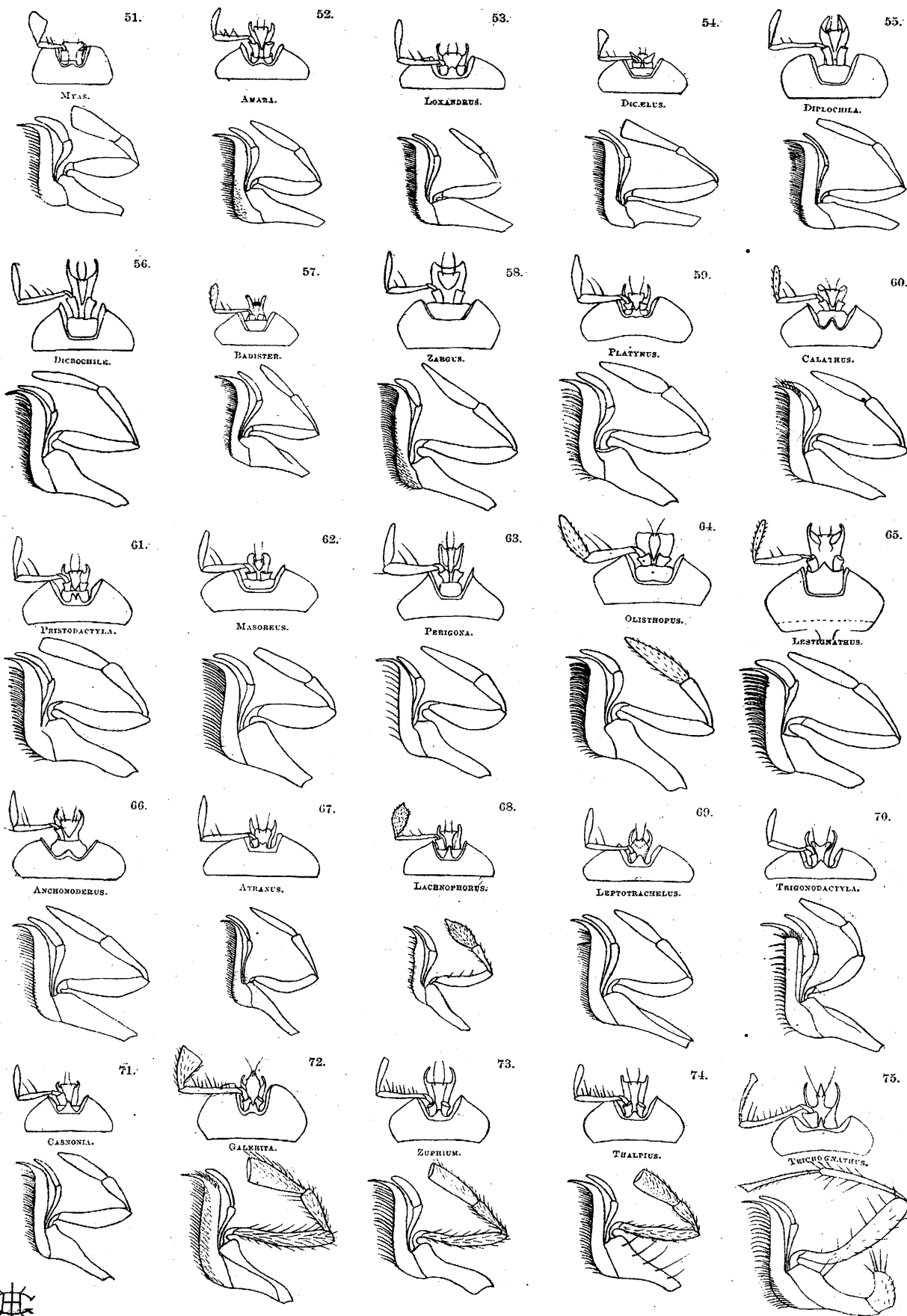
PELOBIUS.

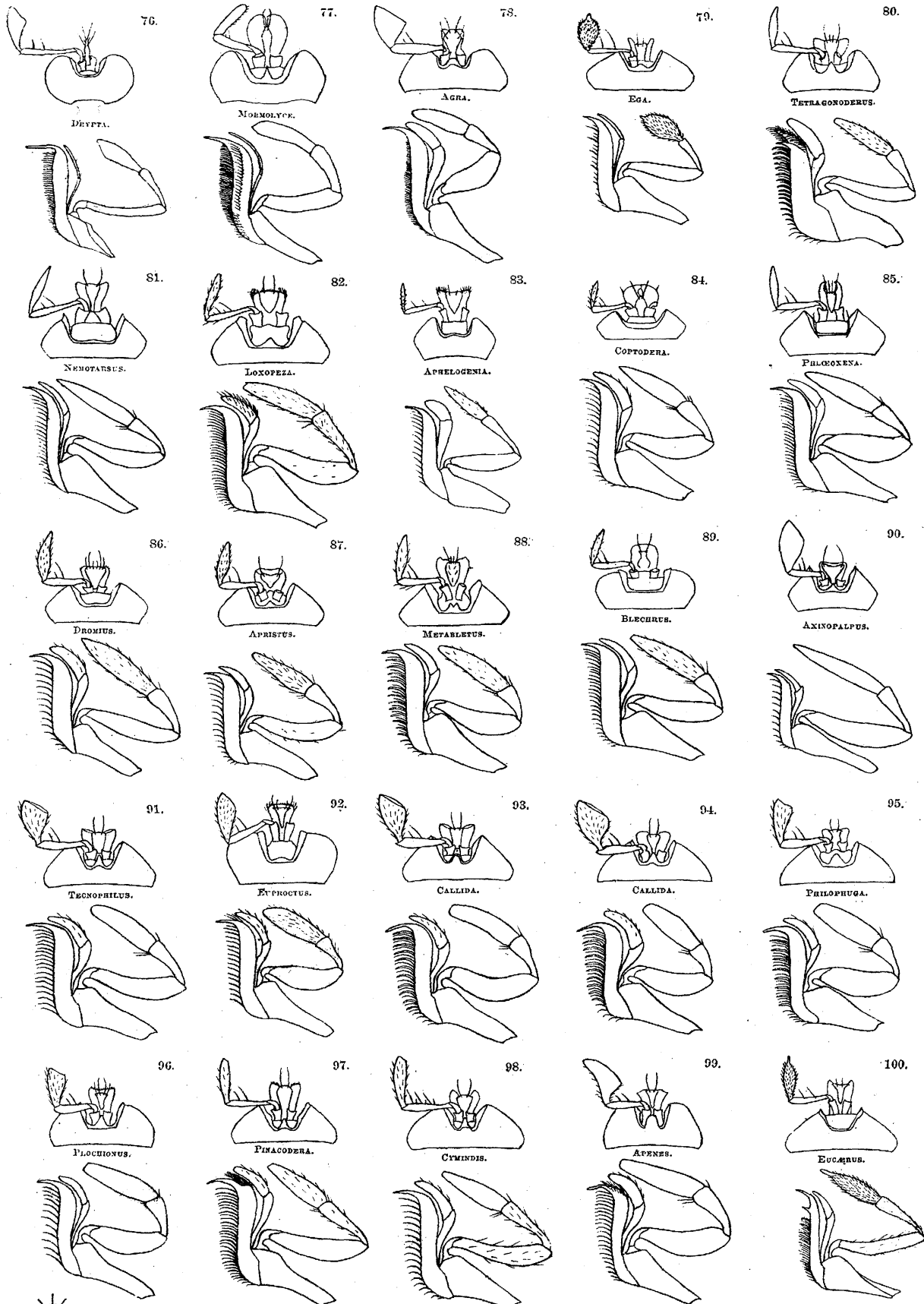


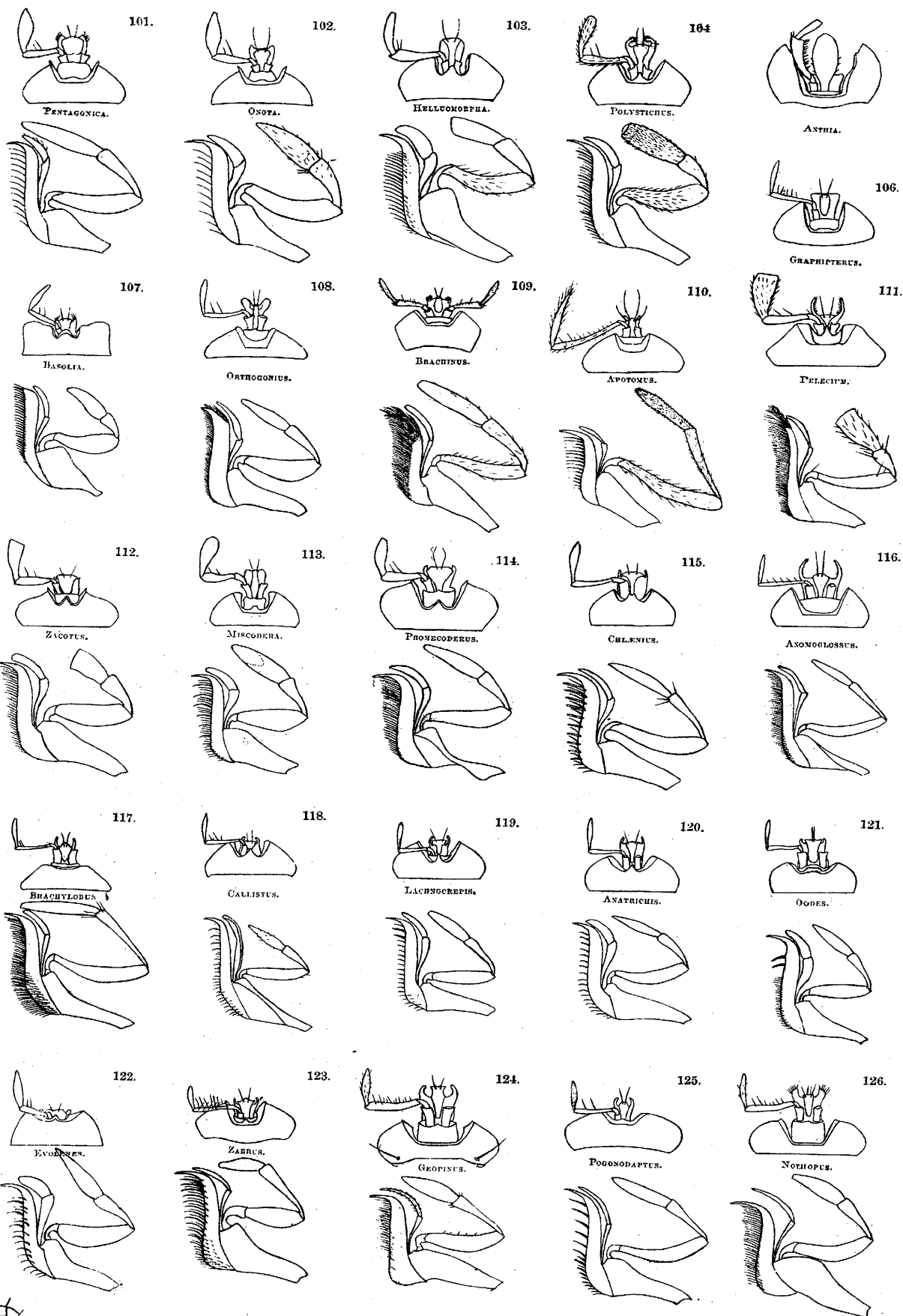






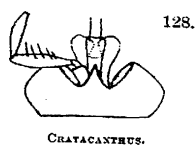
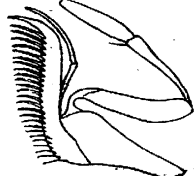




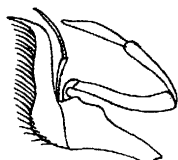




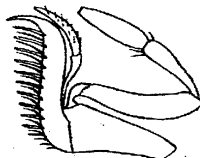
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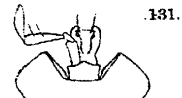
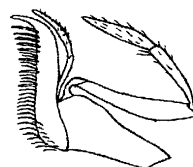
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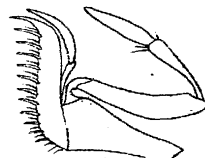
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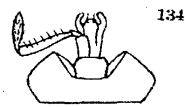
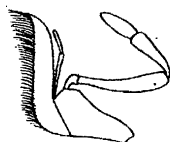
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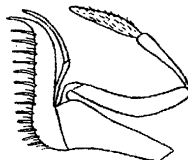
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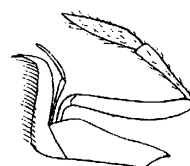
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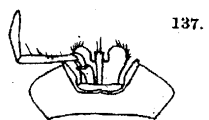
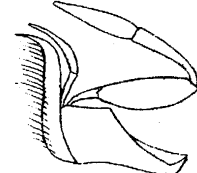
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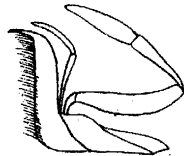
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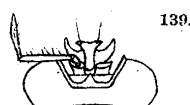
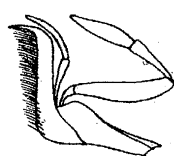
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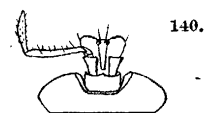
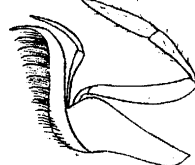
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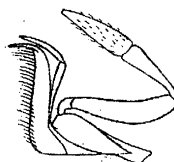
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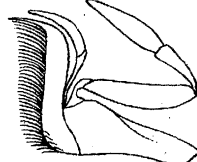
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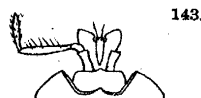
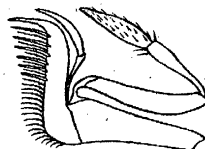
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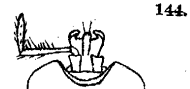
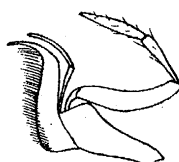
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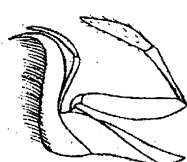
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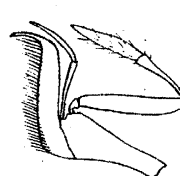
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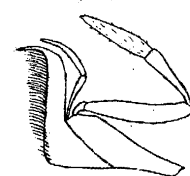
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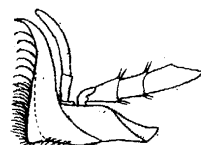
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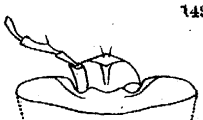
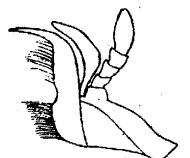
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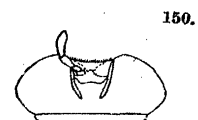
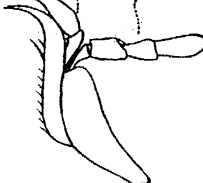
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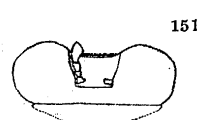
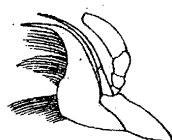
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PELONIUS.



GYRINUS.



DINETUS.

