

A PROPOSED CLASSIFICATION OF THE FOSSORIAL HYMENOPTERA OF
NORTH AMERICA.

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The arrangement of our Fossores contained in the following pages, I trust will be of some service to students of these insects. It has been evident for some time that the existing arrangement, that contained in Cresson's Synopsis,¹ is of little value, as it is too superficial. Entirely too many families, without characters to substantiate them, were recognized: the Sphegidae, for instance, which were divided into no less than nine families. Accepting these nine families would, it seems to me, necessitate the erection of families for such genera as *Neolarra*, *Bothynostethus*, *Trypoxylon* and others, which stand more or less isolated and yet possess characters which connect them in one way or another with the formerly existing families and would form more distinct families, were they so recognized, than, say, the Melinidae, Ampulicidae, Nyssonidae or Bembicidae. How these nine supposed families have been disposed of, the following pages will show.

Saussure's recent classification² is not satisfactory, inasmuch as it is incomplete, and, moreover, his conclusions, particularly regarding the Pompilidae, are not well founded. He makes two tribes of this family, the Pompiliens and Pepsiens, separating them on a very trivial character—the position of insertion of the first recurrent nervure in the second submarginal cell, a character which, in my experience, has always proved variable. Under the first mentioned tribe he includes *Ceropales*, which he seems to consider as not worthy of more than generic rank, while he forms a tribe for the reception of *Pepsis*, which should be placed with the Pompiliens, if anywhere. The Mutillidae and Sapygidae are considered as subfamilies of the Scoliidae; these are ranked as families in this paper. The old families Pemphredonidae and Crabronidae and *Oxybelus*, he considers as tribes of equal value to the Nyssonidae, Bembicidae and Larridae,

¹ Mr. Cresson states that this was simply compiled from the works of other authors.

² Grandidier's Hist. Madagascar, XX.

all of which are ranked as tribes of the Sphegidae. The two families mentioned and *Oxybelus* are treated as subfamilies in this paper as they are more distinct than are the numerous tribes of the Bembicinae and Spheginae.

It is hoped that the paper may at least call forth improvements on the classification suggested.

MUTILLIDÆ.

I regard this as a well-defined family, disagreeing with some authors who place it as a subfamily of the Scoliidæ. The wingless females are, in my opinion, sufficient to separate these insects from the Scoliidæ. In the latter family the intermediate coxæ are widely separated, while in the Mutillidæ they are not separated by a distance equalling their width. In the generic table below, *Photopsis* Blake is considered as synonymous with *Sphaerophthalma* Blake, as a comparison of the two genera fails to show *any* differential characters. The family can be separated into two tribes as follows:—

Females (as far as known) without ocelli; marginal cell of (♂) wings more or less short, not reaching by any means the apex of wing; some of the nervures generally obsolete, particularly those forming the third discoidal cell. MUTILLINI.

Females with ocelli; marginal cell of (♂) wings long and pointed, reaching almost the apex of wings; all the nervures distinct, never obsolete. MYRMOSINI.

Tribe I.—MUTILLINI.

Contains the genera *Psammotherma*,³ *Mutilla*, *Sphaerophthalma* (= *Photopsis* in pt.), *Brachycistis* and *Chyphotes*, and is defined as above. The genera may be tabulated as follows:—

- | | |
|--|--------------------|
| 1—Antennæ simple in both sexes | 2 |
| Antennæ of male flabellate. | PSAMMOTHERMA Latr. |
| 2—Eyes ovate, emarginate within the ♂, entire in ♀; thorax of ♀ generally oblong in shape, truncate behind. MUTILLA Linné. | |
| Eyes round, entire; thorax generally ovate, rounded posteriorly | 3 |
| 3—Intermediate tibiæ with two apical spurs. | 4 |
| Intermediate tibiæ with but one apical spur; wing stigma very large; body smooth, glabrous; marginal cell usually shorter than stigma; antennæ longer than head and thorax | BRACHYCISTIS Fox. |

³ Probably does not occur in America, the species described being very likely erroneously reported from Florida.

- 4—Abdomen at most subpetiolate; thorax of ♀ divided into more than two parts (body, at least the thorax, coarsely sculptured).
 2. SPHÆROPTHALMA⁴ Bl.
 Abdomen connected by a long, slender petiole; thorax (♀) divided into two distinct parts only; ♂ unknown.
 4. CHYPHOTES Bl.

Tribe II.—MYRMOSINI.

Proposed for the genera *Myrmosa* and *Methoca*, and is characterized chiefly by the females possessing distinct ocelli. But few species have been described from America.

- Apex of abdomen (♂), unarmed; wings with three submarginal cells;⁵ cubital nervure of hind wings received by the submedian cell at apex; thorax (♀) composed apparently of two parts; body rugose (♀). MYRMOSA Latr.
 Apex of abdomen (♂) armed with a curved spine; two submarginal cells; cubital nervure of hind wings received considerably before the apex of submedian cell; thorax (♀) divided into three parts; body smooth, shining and very ant-like.
 METHOCA Latr.

If the genus *Thynnus* occurs in America as reported by Patton (Ent. News, III, 104) another tribe will have to be added to this family. I doubt, however, the existence of American representatives.

SCOLIIDÆ.

This family is sufficiently characterized by both sexes being winged to separate it from the Mutillidæ. The North American representatives comprise three tribes,⁶ as follows:—

- Eyes emarginate; spur of fore tibiæ large, strongly curved, dilated, and truncate at end; intermediate tibiæ with one spur; abdomen of ♂ armed with three spines at apex SCOLIINI.
 Eyes entire; spur of fore tarsi not much curved or dilated, either pointed or bifurcate at end; intermediate tibiæ with one or two spurs; abdomen of ♂ with but one spine at apex.
 Sexes similar in form; marginal cell broadened toward the base (in our genera, the ♀'s have the marginal cell open at apex); antennæ short in both sexes TYPHIINI.

⁴ This may ultimately prove but a division or subgenus of *Mutilla*.

⁵ There are really four submarginals, as the cubital nervure extends out to the apex of wing.

⁶ After Saussure.

Sexes dissimilar in form; ♀ robust, ♂ long and slender; marginal cell (♀) narrowed toward base (in our genera the marginal cell is always closed); antennæ in ♀ short, in ♂ long and slender, as long or longer than head and thorax

. MYZININI (*Plesiites* Sauss.)

Tribe I.—SCOLIINI.

Two genera occur in our fauna, as follows:—

Anterior wings with only one recurrent nervure SCOLIA Fabr.

Anterior wings with two recurrent nervures ELIS Fabr.

Each of these genera may be divided into subgenera by the number of submarginal cells. In the subgenus *Triscolia* there are three cells, while in *Discolia* there are two. In *Trielis* three, in *Dielis* two.

Tribe II.—TIPHIINI.

The first and second submarginal cells merged into one through the disappearance of the first transverso-cubital nervure; base of first abdominal segment produced angularly or dentate on each side; intermediate tibiæ with one spur TIPHIA Fabr.

Three submarginal cells, the first transverso-cubital nervure present, but abbreviated, not reaching the cubital nervure; base of first abdominal segment not produced or dentate at base; intermediate tibiæ with two spurs

. EPOMIDIOPTERON Sichel (= *Paratiphia*).

Tribe III.—MYZININI.

This tribe is identical with Saussure's "Section des Plesiites." *Plesia* seems to be synonymous with *Myzine* Latr. The latter has priority, being described two years in advance of *Plesia*. But one genus, *Myzine*, is found in America, which may be distinguished by the tribal characters given above.

SAPYGIDÆ.

Intermediate coxæ contiguous; legs, except tibial spurs, unarmed; no pygidial area; apex of (♂) abdomen without spines. These characters seem sufficient to keep these insects distinct from the preceding family, to which they have been assigned by some authors, and, moreover, the first and second ventral segments are contiguous, while in the Scoliidæ they are widely separated. *Sapyga*, our only genus, has the eyes emarginate within, the intermediate tibiæ with two spurs. For several species having the vertex tuberculate, the

name *Eusapyga* has been proposed by Cresson, but these form only a subgenus at the most.

POMPILIDÆ.

This is a distinct family characterized by the very long posterior legs, long antennæ, and by the first and second ventral segments being not widely separated. The species possess no pygidium. I would separate the family into three tribes, placing the Ceropalini first, as I consider the genus *Ceropales* as being closest to the Sapygidæ.

Sting sheath of ♀ projecting, prominent; eyes slightly emarginate within, near the top; labrum large, projecting; antennæ never curled after death, situated well above the clypeus

CEROPALINI.

Sting sheath of ♀ not projecting; eyes entire.

First discoidal cell not longer than first submarginal; submedian cell of anterior wings longer than the median on the externo-median nervure; second discoidal cell not half the size of the third; labrum exserted, longer than the clypeus; abdomen compressed apically

NOTOCYPHINI.

First discoidal cell longer than first submarginal; labrum not exserted; length of median cell of anterior wings variable; second discoidal cell at least half the size of the third; abdomen rarely compressed.

POMPILINI.

Tribe I.—CEROPALINI.

This tribe contains but a single genus, *Ceropales*, having the characters given above. The species are always more or less ornamented with yellow, some being extremely handsome.

Tribe II.—NOTOCYPHINI.

The genus *Notocyphus* constitutes this tribe, which differs chiefly from the Ceropalini by the non-exserted sting sheath.

Tribe III.—POMPILINI.

The Pompilini contains the typical forms of the family and is, by far, the largest tribe. *Pepsis*, which Saussure considers as a tribe, should, in my opinion, be placed in the tribe Pompilini, as its characters will not warrant a tribal distinction. *Parapompilus* Cress. (non Sm.), *Planiceps* Latr., and *Aporus* Spin., seem to be merely groups of the genus *Pompilus*, as has been pointed out by Kohl.⁷ *Epipom-*

⁷ Verh. zool.-bot. Gesell., Wien, XXXIV, pp. 33-58.

pilus Kohl is scarcely worthy of generic distinction, and should be treated as of equal value as *Parapompilus* Cress.

- 1—Anterior wings with three submarginal cells 2
- Anterior wings with two submarginal cells 9
- 2—Third⁸ ventral segment with a transverse furrow (indistinct in the ♂ of some species) 3
- Third ventral segment without a transverse furrow 6
- 3—First recurrent nervure received by the second submarginal cell in or about the middle. Hind tarsi (♂) not flattened 4
- First recurrent nervure received by the second submarginal cell not far from its base, and considerably before its middle. Hind tarsi (♂) flattened. Fifth, or fifth and sixth ventral segments (♂) nearly always with long, stiff hair, often forming two tufts. Metathorax with a more or less developed tubercle before each stigma PEPSIS Fabr.
- 4—Hind tibiæ not spinose, or scarcely so; submedian cell of fore wings generally but slightly longer than the median on the externo-medial nervure. 6
- Hind tibiæ more or less spinose, generally serrato spinose, most strongly so in the ♀ 5
- 5—Submedian cell of fore wings longer than the median on the externo-medial nervure. . . . SALIUS Fabr. (= *Priocnemis* Sch.).
- Submedian cell of fore wings of the same length as the median on the externo-medial nervure (eyes converging somewhat towards the vertex) CALICURGUS Lep.⁹
- 6—Maxillæ of ♀ with a bunch of long hair at the base. ●
- AGENIA¹⁰ Schiodte
- Maxillæ of ♀ naked. PSEUDAGENIA¹⁰ Kohl.
- 7—Prothorax shorter than the metathorax. 8
- Prothorax longer than the metathorax; head very flat and transverse, the clypeus planate. PARAPOMPILUS Cress. (non Smith).
- 8—Legs strongly spinose; prothorax on the sides not strongly depressed; fore femora not swollen POMPILUS Fabr.
- Legs, except tibial spurs, not spinose; prothorax strongly depressed on the sides; fore femora somewhat swollen ●
- EPIPOMPILUS Kohl.

⁸ Second ventral of some authors.

⁹ I have not seen this genus.

¹⁰ I can find no characters to separate the ♂'s of *Agenia* and *Pseudagenia*, as the characters given by Kohl are not constant. The size of the second and third submarginal cells varies, and while some species of *Agenia* have the wings banded, in others they are clear. Of our species of *Agenia* Cress., *cupidus*, *congruus*, and *acceptus* are *Pseudagenia*. A new genus may have to be erected for *A. Belfragei* Cress. Cameron is mistaken in referring *A. nubifer*, *mexicanus*, *chloris*, *floridus*, *auripilis*, and *subvirescens* to *Pseudagenia*, as they all have the bunch of hair at base of maxillæ.

- 9—Metathorax posteriorly not emarginate, not produced; anterior femora swollen, their tarsi also rather thick; abdomen subcompressed. PLANICEPS Latr.
 Metathorax posteriorly strongly emarginate, produced on each side into a strong tooth; fore femora and tarsi not thickened; abdomen not at all compressed APORUS Spin.

SPHEGIDÆ.

I would divide this vast family into five subfamilies as follows: Spheginæ, Pemphredoninæ, Bembicinæ, Oxybelinæ, and Crabroninæ. I have thought it best to unite under one head the Larridæ, Bembicidæ, Nyssonidæ, Mellinidæ, and Philanthidæ, as it is impossible to find characters by which these families (so-called) can be limited, even as subfamilies. The reader is referred to Handlirsch's paper on *Nysson* and *Bembex*.¹¹ It may seem out of place to put the Pemphredoninæ close to the Spheginæ; yet I feel justified in doing so on account of the abdominal petiole which is peculiar to both subfamilies.

Abdomen connected with the thorax by a slender pedicel of variable length, and never sessile with the following segment.

Intermediate tibiæ with two apical spurs; claws nearly always more or less dentate within SPHEGINÆ.

Intermediate tibiæ with but one apical spur; claws never dentate within PEMPHREDONINÆ.

Abdomen never connected with the thorax by a slender pedicel, at the most subpetiolate as in *Mellinus*.

More than one submarginal cell, if not, then the eyes are emarginate within; neuration of posterior wings complete.

. BEMBICINÆ.

Only one submarginal and two discoidal cells (eyes entire).

Metathorax with a long projection¹² at base; postscutellum with a squama on each side; submarginal cell confluent with first discoidal cell; eyes elongate-ovate, fully three times longer than they are broad medially and converging towards the vertex OXYBELINÆ.

Metathorax and postscutellum without spines or squamæ; submarginal cell not confluent with the first discoidal cell; eyes very broad, not more than twice as long as the width of their broadest part and strongly diverging towards the vertex.

. CRABRONINÆ.

¹¹ Sitzungsab. K. K. Akad. der Wissen., Wien, XCV, Abth. 1.

¹² This is variously shaped, being sometimes bifurcate and again spinose.

Subfamily SPHEGINÆ.

Represented by two tribes as follows:—

- Metathorax unarmed, never dentate SPHEGINI.
Metathorax armed with two strong teeth AMPULICINI.

Tribe I.—SPHEGINI.

Three genera belong to this tribe. They have numerous subgenera or groups of species which at one time were regarded as genera. Kohl's admirable paper, *Die Hymenopterengruppe der Spheciden*,¹³ will be of much value to the student of this group.

Our genera may be separated in the following manner:—

- Second submarginal cell receiving but one recurrent nervure; ♀
with or without tarsal comb SPHEX Linné.
Second submarginal cell receiving both nervures.
♀ without tarsal comb SCELIPHON Klug.
♀ with tarsal comb AMMOPHILA Klug.

As Kohl's work is probably inaccessible to most workers, I give here a table of groups of the three genera:—

Genus SPHEX Linné.

- Second submarginal cell small, much higher than broad.
Claws with a single tooth in middle of inner margin; species
more or less metallic Gr. CHLORION.
Claws with 2-5 teeth on inner margin; species not metallic.
Last ventral plate (♀) compressed, almost keeled medially; claws
bidentate; clypeus produced medially, with a deep sinus on
each side Gr. PALMODES.
Last ventral plate (♀) convex, not compressed; claws 2-5 dentate;
clypeus entire or emarginate medially . . . Gr. HARPACTOPUS.
Second submarginal cell as broad as high, rhomboidal, or rectangular.
Metathorax without stigmal furrow; tarsal comb (♀) wanting;
petiole long and generally bowed Gr. ISODONTIA.
Metathorax, with exception of *S. Lucæ*, with a stigmal furrow;
tarsal comb (♀) present, petiole straight Gr. SPHEX.

Genus SCELIPHON Klug.

- Prothorax longer than the dorsulum.
Head from above not triangular, not much produced behind the
eyes (the prothorax is but little longer than the dorsulum).
. Gr. PODIUM.

¹³ Annalen d. K. K. Naturhistor. Hofmuseum, Wien, V, No. 2, 3.

Head from above triangular, greatly produced behind the eyes
 (the prothorax is longer than the dorsulum, scutellum and
 postscutellum combined) Gr. TRIGONOPSIS.
 Prothorax not as long, at any rate not longer than the dorsulum.
 Gr. SCELIPHRON (= *Pelopocus*).

Genus **AMMOPHILA** Kirby.

Wings with two submarginal cells Gr. COLOPTERA.
 Wings with three submarginal cells.

Second abdominal segment elongate, forming with the first seg-
 ment a long petiole Gr. AMMOPHILA.

Second abdominal segment more or less campanulate, the petiole
 composed of but one joint Gr. PSAMMOPHILA.

Tribe II.—AMPULICINI.

The genus *Ampulex* is represented in North America by the sub-
 genus *Rhinopsis* Westw. It is distinguished by the rostrate clypeus
 and by having two submarginal cells. The prothorax is long as in
Trigonopsis; the metathorax is many ridged and has very strong
 transverse striæ above and possesses two strong teeth. The first
 submarginal cell is twice the length of the second. Marginal cell
 with an appendiculation at apex.

Subfamily **PEMPHREDONINÆ**.

The Mimesidæ are here considered as representing a tribe of this
 subfamily, and *Mimesa* Shuck. as a synonym of *Psen* Latr. It is
 impossible to separate these two genera as their characters vary,
 particularly the neurulation. It is true that the inner spur of hind
 tibiæ of *Mimesa* is peculiarly shaped, but this development will be
 found in *Psen*, although in a lesser degree.

Anterior wings with three submarginal cells; antennæ situated far
 above the clypeus PSENINI.

Anterior wings with two submarginal cells; antennæ close to base of
 clypeus PEMPHREDONINI.

Tribe I.—PSENINI.

Psen (= *Mimesa*), the only genus of this tribe, is easily distin-
 guished by the characters given in the above table. The Psenini
 further differ from the Pemphredonini by the peculiar inner spur of
 hind tibiæ.

Tribe II.—PEMPHREDONINI.

The tribe Pemphredonini comprises the greater number of the

genera of this subfamily. The following table is based chiefly on that in Cresson's "Synopsis":—

Anterior wings with three discoidal cells, therefore with two recurrent nervures.

Abdomen with a tolerably long petiole . . . PEMPHREDON Latr.

Abdomen with the petiole not longer than the hind coxæ.

Posterior tibiæ spinose or subserrate; labrum emarginate at tip.¹⁴

. DIODONTUS Curt.

Posterior tibiæ (excepting the calcaria) unarmed; labrum pointed at tip. PASSALÆCUS Shuck.

Anterior wings with two discoidal cells, therefore only one recurrent nervure

Anterior wings with one submarginal cell . AMMOPLANUS Giraud.

Anterior wings with two submarginal cells.

Petiole short; recurrent nervure joining the first transverso-cubital nervure SPILOMENA Shuck.

Petiole long; recurrent nervure received in the middle of the first submarginal cell STIGMUS Jur.

Subfamily BEMBICINÆ.

Under this head I unite the Larridæ, Bembicidæ, Nyssonidæ, Philanthidæ, and Mellinidæ. The characters of these supposed families are not sufficient or constant enough to sustain them in such a rank, and are valueless in some cases, even as characters of minor importance. As in the case of the Bembicidæ, it is easy to take such types as *Bembex*, *Monedula*, forms with rostrate clypeus, and separate them into a family, apparently distinct from the Nyssonidæ and Larridæ, if these genera are compared, say, with *Larra* and *Nysson*; but certain genera will be encountered, *Neolarra* and *Bothynostethus* for instance, whose proper position will remain undetermined. *Neolarra* combines both Larrid, Bembicid and Nyssonid characters, yet it will fit in neither of the families defined. *Bothynostethus* inclines to both the Larridæ and Nyssonidæ, and seems to be a connecting link between them. *Stizus* and *Sphecius*, although placed in the Bembicidæ, possesses the neuriation and non-rostrate labrum, characters which bind them to the Nyssonidæ. It must not be forgotten that the labrum of the Nyssonidæ is prominent, indeed in *Gorytes* very prominent. Thirteen tribes of this subfamily seem to be indictated, which number will undoubtedly have to be reduced in the future.

¹⁴ I have not seen *Polemistus* Sauss., described as occurring in Madagascar and Mexico. It is related to *Passalæcus* and *Diodontus*.

- 1—Labrum projecting in such a manner as to cover the mandibles when closed, sometimes rostriform 4
 Labrum projecting more or less,¹⁵ but not covering the mandibles, never rostriform; antennæ situated close to or not far from base of clypeus; if the latter is divided into three lobes the middle lobe is not greatly enlarged 2
 Labrum not at all projecting, hidden from view by mandibles; antennæ situated far above the clypeus; middle lobe of latter greatly enlarged. PHILANTHINI.
- 2—Mandibles emarginate on outer margin (except in *Trypoxylon*) . 5
 Mandibles not emarginate 3
- 3—Three submarginal cells; intermediate tibiæ with two spurs.
 Second submarginal cell not petiolate; apical joint of antennæ (♂) normal. MELLININI.
 Second submarginal cell petiolate; apical joint of antennæ (♂) peculiarly shaped. NYSSONINI.
 Two submarginal cells; intermediate tibiæ with one spur.
 NEOLARRINI.
- 4—Intermediate tibiæ armed with two spurs at apex; submedian cell of posterior wings extending far beyond the median on the externo-medial nervure; labrum shorter than the clypeus, generally rounded anteriorly; ocelli distinct STIZINI.
 Intermediate tibiæ with but one spur at apex; submedian cell of posterior wings not extending beyond the median on the externo-medial nervure; labrum longer than the clypeus, rostriform; ocelli more or less imperfect BEMBICINI.
- 5—Hind ocelli normal. 6
 Hind ocelli more or less distorted LARRINI.
- 6—Eyes entire. 7
 Eyes emarginate within. TRYPOXYLONINI.
- 7—Second submarginal cell not petiolate. 8
 Second submarginal cell petiolate. 10
- 8—Middle tibiæ armed with two spurs at apex. 9
 Middle tibiæ with one spur at apex LYRODINI.
- 9—Eyes (♂) touching above; second submarginal cell receiving both recurrent nervures ASTATINI.
 Eyes (♂) not touching on the vertex, widely separated; first and second submarginal cells each receiving a recurrent nervure DIPLOPECTRINI.
- 10—No pygidial area (two submarginal cells) MISCOPHINI.
 A pygidial area (three submarginal cells)
 BOTHYNOSTETHINI.

Tribe I.—PHILANTHINI.

Hind femora more or less thickened at apex, truncate, and produced beneath CERCERIS Latr. (= *Eucerceris* Cr.).

¹⁵ Astatini and Dioploplectrini seem to be exceptions to this definition, or else the labrum projects so little as to be indiscernible.

Hind femora more or less narrowed at apex, not truncate, and not produced beneath.

Abdomen with first segment not at all petiolate.

Eyes entire within; submedian cell of posterior wings much shorter than the median on the externo-medial nervure; ♀ with a distinct pygidial area *APHILANTHOPS* Patt.

Eyes more or less emarginate within; submedian cell of posterior wings as long or slightly longer than the median on the externo-medial nervure; ♀ without a pygidial area.

. *PHILANTHUS* Fabr.

Abdomen with first segment subpetiolate, as in *Mellinus*.

. *TRACHYPUS* Kl.

Tribe II.—MELLININI.

In this tribe I include *Mellinus* and *Gorytes*, separating them from the Nyssonini chiefly because the apical joint of the ♂ antennæ is normal and is not crescent or otherwise shaped as in the Nyssonini; also because the second submarginal cell is not petiolate as in that tribe.

Antennæ well separated, situated close to base of clypeus, anterior margin of clypeus denticulate; a recurrent nervure received by the third submarginal cell; abdomen always with first segment always petioliform *MELLINUS* Fabr.

Antennæ approximate, generally well separated from base of clypeus; anterior margin of clypeus rarely or never dentate; third submarginal cell never receiving a recurrent nervure, abdomen rarely with the first segment petioliform . . . *GORYTES* Latr.

The genera *Hoplisus*, *Dienoplus* and *Euspongus* are identical with *Gorytes*

Tribe III.—NYSSONINI.

Prothorax above subquadrate, longer than dorsulum; metathorax not strongly spinose; (posterior femora beneath at apex, produced into a stout tooth), form slender.

Submedian cell of anterior wings much longer than the median on the externo-medial nervure; abdomen without a pale spot on each side of the second dorsal segment . . . *DIDINEIS* Wesm.

Submedian cell of anterior wings a little shorter than the median on the externo-medial nervure; abdomen with a pale spot on each side of second dorsal segment *ALYSON* Jur.

Prothorax above very narrowly transverse; metathorax with two long spines (tooth of posterior femora not so strong as in the preceding two genera); form robust *NYSSON* Latr.

In the foregoing table *Paranysson* and *Hyponysson* are considered synonymous with *Nysson*. The lack of the third submarginal cell in *N. (Hyponysson) bicolor* is simply an anomaly.¹⁶ I have recently received another anomalous species (which is new) from New Mexico, which lacks the second (petiolated) submarginal cell.

Tribe IV.—STIZINI.

Marginal cell about twice as long as the first submarginal; spurs of hind tibiae enlarged in the ♀, and the pygidium well developed; abdomen (♂) with a single spine at apex . . . SPHECIUS Dhlb.
Marginal cell much shorter than the first submarginal; spurs of hind tibiae short in both sexes, not enlarged; no pygidium, at the most with two short ridges on each side of apical portion of last dorsal abdominal segment; abdomen (♂) with three spines at apex . . . STIZUS Latr.

Bembecinus and *Megastizus* are considered synonymous with *Stizus* in the foregoing table.¹⁷

Tribe V.—BEMBICINI.

Anterior ocellus linear, transversely arcuate.

Maxillary palpi six-jointed, labial palpi four-jointed. Metathorax excavated posteriorly, compressed laterally; last ventral segment (♂) with three spines. BEMIDULA Burm.

Maxillary palpi four-jointed, labial palpi two-jointed; metathorax flat or convex behind, not compressed laterally; last ventral segment (♂) with a single spine.
. BEMBEX Fabr. (= *Microbembex* Patt.).

Anterior ocellus elliptic, round or reniform.

Maxillary palpi three-jointed, labial palpi one-jointed; anterior ocellus longitudinally elliptic; maxillae very long, reaching the hind coxae STENIOLIA Say.

Maxillary palpi six-jointed, labial palpi four-jointed; anterior ocellus round or reniform; maxillae short . . . MONEDULA Latr.

Tribe VI.—NEOLARRINI.

This tribe is based on a single genus *Neolarra* Ashm. which may be distinguished by its tribal characters. I have not examined this genus during the preparation of this classification, but if my memory serves me right it should be placed here, between the *Bembicini* and *Bothnostethini*.

¹⁶ See Handlirsch, Sitzb. K. Akad. Wissensch., Wien. Math.-naturw. Classe, XCV, Abth. 1, p. 293.

¹⁷ See Handlirsch, l. c. CI, p. 26-34.

Tribe VII.—BOTHYNOSTETHINI.

Marginal cell truncate, with an appendiculation; eyes converging towards vertex; hind femora not thickened at apex

PLENOCULUS Fox.

Marginal cell pointed at tip, without appendiculation; eyes diverging towards vertex; hind femora, especially in ♀, thickened at apex.

BOTHYNOSTETHUS Kohl.

Tribe VIII.—ASTATINI.

This tribe is formed of the genus *Astatus*, and is based chiefly on the strange disposition of the eyes of the male sex; they meet on the vertex, a characteristic not found in any other genus of the fossorial Hymenoptera, and not, as far as I know, in any genus of the Order.

Tribe IX.—DIPLOPECTRINI.

The genus *Diplopectron* forms this tribe. The chief characters are that both sexes have the middle tibiæ two spurred, the very short submarginal cell and the prominent and very long prothorax. It is evidently allied to the European genus *Dinetus*, which probably belongs to this tribe. As the latter is the older genus, the name proposed for this tribe will have to give way to *Dinetini*, but as *Dinetus* does not occur in North America, and as this is simply a classification of the forms inhabiting that region, I prefer to use the name proposed above.

Tribe X.—MISCOPHINI.

Wings with two submarginal cells, the first receiving a recurrent nervure; marginal cell acuminate, not appendiculate; eyes converging but little or not at all towards vertex . . .

MISCOPHUS Jur.

Wings with three submarginal cells, both recurrent nervures being received by the second submarginal cell; marginal cell elongate, truncate at apex and appendiculate; eyes strongly converging towards vertex

NITELIOPSIS Saund.

Tribe XI.—LYRODINI.

Lyroda, upon which this tribe is based, might be placed in the Larrini, were it not for the regularly formed and distinct ocelli. The only other character worth mentioning in which it differs from the following tribe, is the peculiar shape of the prothorax above, which is being apparently twice emarginate, with the intervening space strongly developed.

Tribe XII.—LARRINI.

Under this head are placed all those genera of the old family Larridæ, which have the hind ocelli distorted and more or less obsolete.

Just within the inner eye margins there is a more or less developed longitudinal fold or swelling.

Mandibles not dentate within; outer side of anterior tibiæ armed with strong spines; pygidium (♀) not pubescent . . . LARRA Fabr.

Mandibles armed with one or two teeth within.

Pronotum drawn under the dorsulum, especially at the sides; metanotum longer than the dorsulum; anterior femora (♂) not emarginate near the base; pygidial area covered with a hoar-frost-like pile NOTOGONIA Costa.

Pronotum not drawn under the dorsulum; metanotum shorter than the dorsulum; anterior femora (♂) emarginate near the base as in *Tachysphex* and some species of *Tachytes*; pygidial area on apical portion with short, stiff hairs.

. ANCISTROMMA Fox.

Within the inner eye margins there are no signs of a swelling or fold.

Comb on anterior tarsi (♀) composed of stiff, tolerably short thorns; pygidial area entirely covered with pubescence; hind ocelli linear, hooked at upper end; fore femora of ♂ either emarginate or not emarginate near the base beneath . TACHYTES Pz.

Comb on anterior tarsi (♀) composed of very long flexible spines or bristles; pygidial area naked; hind ocelli oval; fore femora (♂) always emarginate near the base beneath . TACHYSPHEX Kohl.

Tribe XIII.—TRYPOXYLONINI.

Anterior wings with three submarginal cells; abdomen short, sessile.

Female with a well-developed pygidium; marginal cell shorter than the first submarginal; antennæ of ♂ more or less dentate

. PISONOPSIS Fox.

Female without a pygidium; marginal cell nearly as long as the three submarginal cells united; antennæ of ♂ not dentate. . .

. PISON Spin.

Anterior wings with two submarginal cells; abdomen long, clavate

. TRYPOXYLON Latr.

Subfamily OXYBELINÆ.

In my opinion the peculiar armature of the metathorax and postscutellum, together with the form of the eyes and neurulation, justifies the retention of the genus *Oxybelus* in a subfamily. Sausure forms a tribe of it.

Subfamily CRABRONINÆ.

Eyes hairy; mandibles emarginate exteriorly.

..... ENTOMOGNATHUS Dhlb.

Eyes not hairy; mandible not emarginate externally.

Second discoidal cell long, narrow, obtusely pointed at apex,
longer than the first discoidal cell; form short, robust; abdomen
beneath flat, or subconcave ANACRABRO Pack.

Second discoidal cell broadest at apex, shorter than the first
discoidal; form elongate; abdomen convex beneath.

..... CRABRO Fabr. (= *Rhopalum*).



Fox, William J. 1894. "A Proposed Classification of the Fossorial Hymenoptera of North America." *Proceedings of the Academy of Natural Sciences of Philadelphia* 46, 292–307.

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